Asian Development Bank

Greater Mekong Subregion

Capacity Building for Efficient Utilization of Biomass for Bioenergy & Food Security in the GMS [TA7833-REG]

TECHNICAL REPORT:

An Overview of Sustainable Standards and Certification Systems

November 2013

Landell Mills
DEVELOPMENT CONSULTANTS

nexus
Carbon For Development

KEY DATA

Name of Project:	Capacity Building for Efficient Utilization of Biomass for Bioenergy & Food Security in the GMS TA-7833 REG
Contractor:	Landell Mills Limited (LML), Bryer-Ash Business Park, Trowbridge, Wiltshire, BA14 8HE, UK Tel: +44 1225 763777 (www.landell-mills.com) in consortium with: Nexus Carbon for Development (Nexus), #33 E3 Sothearos Blvd, Corner St. #178, Phnom Penh, CAMBODIA (www.nexus-c4d.org)
Contracting Authority:	Asian Development Bank (ADB)
Start/End Date:	15 Dec 2011 - 15 March 2015
Budget:	N/A
Beneficiary:	Ministries of Agriculture of Cambodia, Lao PDR and Viet Nam
Location:	Greater Mekong Subregion, incl. Cambodia, Lao PDR and Viet Nam

QUALITY ASSURANCE STATEMENT

Version		**Status**	**Date**
An Overview of Sustainable Standards and Certification Systems		Final	17/11/2013
	Name	**Position**	**Date**
Prepared by:	[redacted]		[redacted]
Checked by:	[redacted]	[redacted]	[redacted]

Report submitted by
LANDELL MILLS LTD

This report was prepared at the request and with the financial support of the ADB. The views expressed are those of the Consultants and do not necessarily reflect those of the GMS Governments or the ADB.

CONTENTS

ACRONYMS

ADB	Asian Development Bank
AROS	Asian Regional Organic Standards
ASEAN	Association of Southeast Asian Nations
BSI	Better Sugar Initiative
CEA	California Environmental Associates
CEN	Comité Européen de Normalisation (European Committee for Standardization)
CLV	Cambodia, Lao PDR, Viet Nam
CoC	Chain of Custody
EICC	Electronic Industry Citizenship Coalition
EPA	Environmental Protection Agency
ERIA	Economic Research Institute for ASEAN and East Asia
ETI	Ethical Trading Initiative
EU	European Union
EU–RED	European Union – Renewable Energy Directive
FRC	Forest Resources Council
FSC	Forestry Stewardship Council
GAP	Good Agricultural Practices
GBEP	Global Bioenergy Partnership
GHG	Greenhouse Gas
GMP	Good Manufacturing Practice
IEC	International Electrotechnical Commission
IFOAM	International Federation of Organic Agriculture Movements
ILO	International Labour Organization
ILUC	Indirect Land Use Change
ISCC	International Sustainability and Carbon Certification
ISEAL	International Social and Environmental Accreditation and Labelling
ISO	International Organization for Standardization
ITC	International Trade Center
LED	Light-emitting Diode
LEED	Leadership in Energy and Environmental Design
MAF	Ministry of Agriculture and Forestry
MAFF	Ministry of Agriculture, Forestry and Fishery
MARD	Ministry of Agriculture and Rural Development
MSC	Marine Stewardship Council
NGO	Non-governmental Organization
PEFC	Programme for the Endorsement of Forest Certification
PGS	Participatory Guarantee Systems
RA–SAN	Rainforest Alliance – Sustainable Agriculture Network
RFA	Renewable Fuels Agency
RSB	Roundtable for Sustainable Biomaterials (formerly Biofuels)
RSPO	Roundtable for Sustainable Palm Oil
RTRS	Roundtable for Responsible Soy Production
SPS	Sanitary and Phytosanitary Standard
TA	Technical Assistance
UK–RTFO	United Kingdom – Renewable Transport Fuel Obligation
UNOPS	United Nations Office for Project Services

USD	United States dollars
US–RFS	United States Renewable Fuels Standard
WCO	World Customs Organisation
WTO	World Trade Organization
WWF	World Wide Fund for Nature

EXECUTIVE SUMMARY

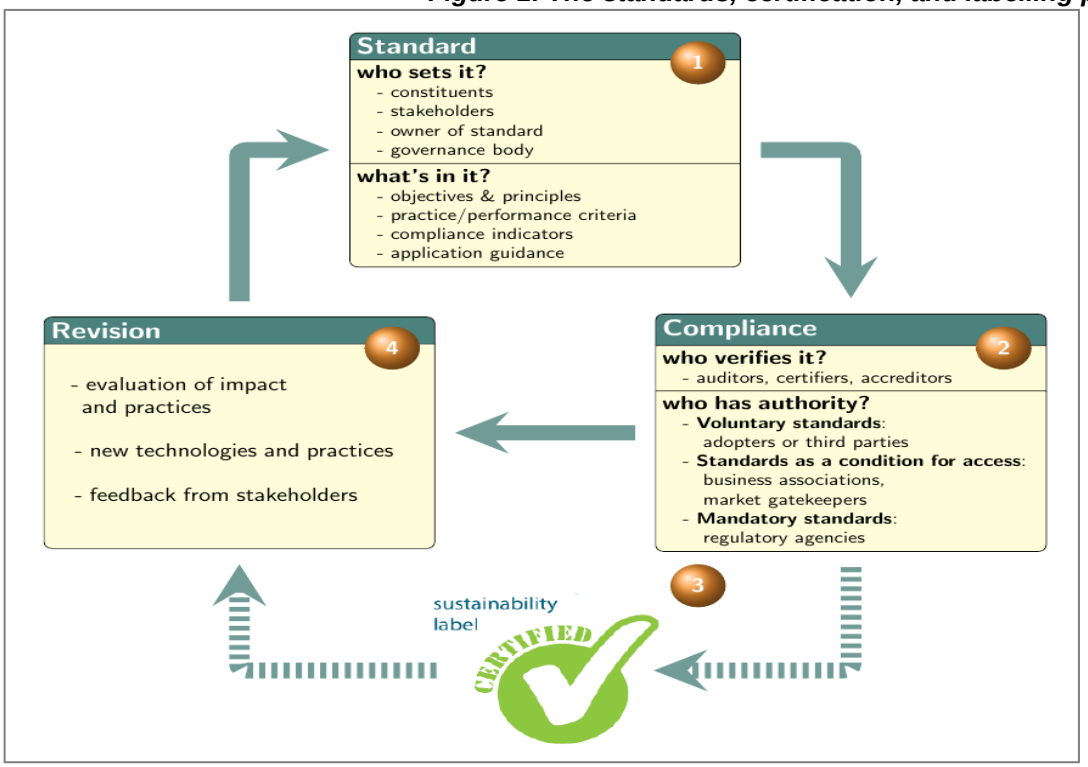
The benefits of utilising biomass for bioenergy and food security are well known: it is a sustainable locally-available renewable energy source; it reduces agricultural pollution (e.g. reduces air pollution from disposal from in-field burning, and lowers wider environmental pollution such as run-off of agri-waste residues); it provides a potential low-cost organic fertiliser (thus lowering input costs for farmers and improving their margins); and it creates a possible new or improved income source for farmers.

However, the potential use of standards and certification systems as policy tools to scale-up utilisation are less well known. Firstly, such systems can help **to differentiate a product from other products**. In this way a price premium can be obtained for the product (e.g. an organic food product) which will provide an incentive for further investment in utilising biomass for bioenergy and food security. Secondly, if buyers knew that a product from one country was certified according to certain standards, then buyers are assured that the product has qualities or attributes that are compatible with certain values (e.g. more environment-friendly). In this way, certification can facilitate cross-border trade. In certain sectors, harmonisation of standards between countries may be necessary in order to enhance trade. This is best exemplified in the electronics sector, where compatibility of electronic components is essential. Finally, mandatory standards, also called regulations, and certification, may be required to enforce **public policy** on, for example, food safety, protection of the environment, agricultural waste disposal, or the use of pesticides and chemical fertilisers. Such regulations, if enforced, force enterprises to invest in better ways to dispose of their agricultural waste by converting them either into bioenergy or into soil amendments. Mandatory standards often thus provide the 'push' for the take-up of private-led voluntary standards, which provide the 'pull' factor, as described above.

There are many other uses of standards. As a business strategy, standards can transform business practices and have the potential to increase market access through long-term contracts with overseas buyers who may demand acceptance to a certain standard. As a policy advocacy tool, standards can promote more responsible behaviour among consumers.

While a standard and its performance requirements are at the heart of the standards system, the expected benefits are increased when compliance against the standard is ensured i.e. through a certification system. Labelling of products confirms differentiation, and compliance according to agreed standards and certification provide sellers and buyers more information and certainty in transactions. Standards, certification, and labelling are three tools that are interdependent, as highlighted in the figure below. A set of goals underlie the entire process of standardization, certification and labelling that aim at addressing a specific problem.

Figure 1: The standards, certification, and labelling process



Source: Adapted with modifications from Steering Committee of the State-of-Knowledge Assessment of Standards and Certification (2012)

Standards can thus be set-up by the government (mandatory standards or regulations) or the private sector (voluntary standards). The use of standards and certification often evolve and innovate in response to increased scale and recognition and also changing consumer demand resulting in schemes that originate in the private sector being increasingly codified in regulatory or legal frameworks. Equally the same progression occurs from purely public sector regulatory approaches moving toward private sector approaches (e.g. in agricultural value chains where actors in the chain agree to coordinate activities, set standards…etc). In determining the policy options required to achieve certain goals (e.g. increasing the utilisation of biomass for bioenergy and food security) a government may decide that the most appropriate policy choice is to create regulatory systems. Equally a group of stove producers may create a set of performance and quality control standards, or growers adopt organic production standards voluntarily. However, even in the case of voluntary standards and certification systems the government can still have a role in helping to facilitate the development of these which may increase the uptake of voluntary standards. For example: by enacting supporting national regulations (see the push-factor mentioned above); by adopting or incorporating voluntary standards into the national regulatory framework; by favouring products which adhere to a set of voluntary standards through their import and export policies; by requiring products which adhere to certain standards in government purchases; by providing public funding and tax breaks to those who wish to be certified, or assistance in the standards development process; by publicly endorsing a standards certification system; and in providing expert help in the development and implementation of standard and certification systems.

However, it should be realised that standards, certifications and labelling systems have their limitations. Standards and certification programs have been criticized for:

- The high cost in developing standards and codifying these into an agreed procedure

- The lack of long-term or exit strategies with many programs dependent on the donor community, and it has yet to be seen if any existing sustainability system is ready to stand on its own, supported by the market;
- A loss of market access premiums with the growth in certified supply sources;
- The lack of provision for capacity building for producers to enable compliance;
- The lack of stakeholder representation in some governance structures, being led by large-scale agro-industry with their own interests;
- Not always being transferable successfully in all climatic zones or ecosystems;
- The proliferation of certification schemes which could lead to confusion or reduce confidence among consumers. Harmonization of standards is seen as a way to address the proliferation of sustainability standards and the problems they raise for both exporters and importers.
- The high direct costs for attaining the standards and complying with these for small holder producers or small and medium enterprises
- The costs of compliance including third party audit and certification assessment and high indirect costs for upgrades in management and investments needed to meet the standard. Such costs are often well beyond the reach of smallholders although group certification, and the use of local certification bodies (instead of foreign certification bodies) may address this.

Experience from sustainability standards and certification systems in the agriculture, forestry and fishery sectors indicates that the context of such systems plays a very important role in their success or failure. The conditions in which such programs are introduced influence adoption of standards and the operation of certification systems. Certain contexts are supportive and some are not. Different pre-existing characteristics and relationships leave some stakeholders well-placed and others ill-placed to respond to the opportunities provided by certification. The context conditions identified as being important include:

- *Product and trade characteristics*. Products with strict requirements of traceability, quality and safety (e.g. food); products containing commodities identifiable in end products (e.g. cocoa); and length and integration of the chain (short chains with few actors).
- *The country's position in international trade*. Firms are more open to certification if it supports their ability to compete with foreign suppliers.
- *Selection bias*. There is bias toward regions and farmers that are comparatively better endowed with resources due to general economic and development conditions. Among farmers, marginality is a barrier to adoption. Standards also favour larger operations, though this varies from industry to industry due to compliance and transaction costs. Increasing bureaucratic requirements of certification systems, moreover, privilege larger entities.
- *Regulatory framework design and enforcement.* Having clear and existing property rights, clear rules of engagement, and enforcement of regulations contributes to the successful implementation of standards in various contexts. In forestry and fishery, development and enforcement of regulation affects the costs and risks of certification. Predictable and effective law enforcement rewards firms that identify eco-sensitive markets which reward certified products and services through price premiums.
- *Institutional environment.* Governments play an important enabling and supporting role in the implementation of standards. Managerial capacity, technical and financial support from donor organizations, as well as concerted institutional efforts of managers, NGOs, governments, certification and accreditation bodies, donor agencies, research institutions

and business development service providers also determine of the success of implementing certification systems.
- The coordination of participants through existing social or industry networks that can use standards as an additional tool for their benefit.

In addition, the benefits (or impacts) of such systems are not yet widely understood. Based on evidence to date however, using findings from the agriculture, forestry, fishery sectors mentioned in this paper, we see that, in terms of environmental and social benefits:

- There is evidence of positive effects in improving environmental and social conditions in quite limited and specific cases (such as habitat for apes, and well-being of workers). Forest certification has resulted in changes in forestry practices, but it is unclear whether it has resulted in a decline in forest degradation and deforestation.
- Being certified may reduce income vulnerability, but does not seem to be enough to raise livelihoods to a sustainable level. Certification has often been found to cost more than it delivers, so needs to supported or complemented by government policies and interventions that target development needs at the community level.
- There can be non-income benefits to being part of a certified producers group such as access to credit, market information, trainings, and business management assistance.
- Income benefits to individual members of certified groups do not entirely come from certification, but from other support activities provided by the organization (e.g. training for handicraft making). Standards do not guarantee that price premiums necessarily reach the farmers or the communities.
- The issue of gender empowerment has not been well explored. Evidence of participation and access to cash income are mostly anecdotal.
- Assessments of the benefits to the environment of Marine Stewardship Council (MSC) certifications have generated mixed results. Most studies find that while MSC may provide incentive for industry to adopt better stock management, it had failed to demonstrate that certification prevented the decline of fish stocks. It seems that certification alone is not likely to arrest declining fish stocks.

In terms of the relationship between international standards and trade, there are some instances of a positive effect which is mostly found in the manufacturing sector, where trends show that:

- When exporting countries use international standards, this has a positive (or at least neutral) effect on their export performance.
- When exporting countries use national standards, it may lead to superior export performance by that country.
- When importing countries use international standards, the most common effect is an increase in their imports.
- When the importing country uses national standards, the effects are more diffused. Studies looking exclusively at voluntary standards show that the effects are distributed evenly. For those looking at regulations or mandatory standards, the effect on imports tends to be negative.

The literature on standards supports the view that international standards support trade. Findings on national standards find both positive and negative effects, and thus only partially support the view that national standards create barriers to trade. Evidence does not provide a single answer to

the issue of trade effects, as it appears that this depends on how multiple economic effects interact, and as such the effects are often context-defined.

In terms of whether standards create a price premium, there is no clear evidence that final consumers actually look for certified products when shopping and pay higher prices for such products. In the last two decades, the individual consumer is not as significant as once perceived to be. Institutional and business buyers have been the major drivers in the demand for certification. Government and public bodies have become important purchasers, as many have adopted green procurement policies. Thus it is these actors who may have more influence in creating price premiums.

In conclusion, because of these limitations, standards, certification and labelling systems are best seen as one instrument in a portfolio of tools. Other tools, including regulatory mandates and incentives, may be better situated to influence the parts of the market in which voluntary standards and certification are less attractive, less well understood, or unimportant to consumers and producers. The market access benefits of certification against agreed standards, however, is a significant consideration with indications that certification can lead to improvements in income and well-being at the household and community level. Government agencies wishing to implement regulations should consider the option of using and adapting existing voluntary standards to a specific agency's needs and objectives. In comparison with voluntary systems, national governments have at their disposal a much wider array of conformity assessment options, and can thus, in principle, implement standards with stronger force.

1. INTRODUCTION

The Nordic Development Fund and the Asian Development Bank (ADB) are supporting the Greater Mekong Subregion (GMS) Working Group on Agriculture (WGA) for implementation of the Capacity Building for Efficient Utilization of Biomass for Bioenergy and Food Security in the GMS [TA7833] project in Cambodia, Lao PDR and Viet Nam from December 2011 to June 2014. A consortium of consultants led by Landell Mills Ltd from the United Kingdom is providing technical assistance (TA) to this project. The regional project aims to improve utilization of biomass for bioenergy and food security in Cambodia, Lao PDR and Viet Nam (CLV). The Ministry of Agriculture, Forestry and Fisheries (MAFF), Cambodia; Ministry of Agriculture and Forestry (MAF), Lao PDR; and Ministry of Agriculture and Rural Development (MARD), Viet Nam are the implementing agencies.

The benefits of utilising biomass for bioenergy and food security are well known: it is a sustainable locally-available renewable energy source; it reduces agricultural pollution (e.g. run-off of agri-waste residues); it provides a potential low-cost organic fertiliser (thus lowering input costs for farmers and improving their margins); and it creates a possible new or improved income source for farmers.

However, scaling-up of investments in biomass utilisation for bio-energy and food security will only be possible if it is financially and technically viable to do so. Financial viability partly depends on the cost of supply of biomass which in turn, depends on various factors. These include the opportunity cost of biomass (e.g. does it have other uses such as straw for animal bedding), the costs of aggregating biomass, and the cost of production. The cost of production is linked to the technology used e.g. the cost of converting biomass to energy or to a fertiliser product. It also depends on the price of the associated end-products e.g., the price for organic products which use biomass as a fertiliser (soil amendment) and the price of energy from bioenergy sources/biodigesters. If the price received is not higher than the cost of production (including any government subsidies[1]) then biomass will not be utilised in any significant way for bioenergy or food security.

The price is largely a determinant of the demand for products (and services). Purchasers (e.g. individual consumers of organic products, as well as retailers and overseas buyers, purchasers of improved cookstoves (ICS), and purchasers of energy) may pay more for a product which efficiently utilises biomass due to perceived gains (e.g. health gains through eating organic produce, efficiency and health gains through using ICS, or moral gains in terms of protecting the environment). However, a purchaser will only pay a premium if he/she is assured that the product is what it says it is. How will he/she know that? Normally, through checking (via a label) that the product is certified according to certain standards. This is true for almost all products in today's globalised societies. For example, a consumer may be willing to pay more for a banana which is labelled as 'fair trade', or prefer to buy a household appliance that he/she believes has environment-friendly qualities and features as attested to by an energy label showing the product's conformity to set standards. Without such information the consumer makes a far less informed decision, i.e., he/she suffers from information asymmetry. The degree of uncertainty the consumer faces may influence his/her willingness to pay the premium.

[1] *For example, many bioenergy plants are only financially viable since the cost of production is artificially reduced through government subsidies.*

Thus the market demand, and hence the price, for food or energy products using biomass in the value chain can be improved when a set of standards is in place to differentiate between products. For example, a standard to assure a buyer that they are buying an improved cookstove and a standard to assure a consumer the food they are buying is organic. This should then make investments in the utilisation of biomass for bioenergy and food security more financially viable. Thus, **a standards (and certification) system may be required to differentiate a product from other products**.

Such standards would be even more beneficial if they were accepted across borders, thus further increasing the potential demand for a product. If buyers knew that a product from Vietnam met the same specifications as a similar product in Laos or Cambodia, and vice-versa, then they would more likely engage in cross-border trade, knowing that such products are compatible with their domestic standards. This requires **harmonisation of standards between countries which would potentially enhance trade (i.e. regional or international) and agreement on how these standards are verified**[2].

Finally, mandatory standards, also called regulations, may be required to enforce **public policy**, on for example, protection of the environment, agricultural waste disposal, or the use of pesticides and fertilisers. Such regulations, if enforced, require enterprises to invest in better ways to dispose of their agricultural waste, which could be for bioenergy or for soil amendments. Such mandatory standards often thus provide the 'push' for the take-up of private-led voluntary standards, which provide the 'pull' factor, as described above.

Standards can thus either be set-up by the government (mandatory standards or regulations) or the private sector (voluntary standards). Even in the case of voluntary standards the government can have a role in helping to facilitate the development of these.

Many policymakers and senior officials in CLV are aware of the existence of standards and certification systems (some of whom even interact and participate within such systems), however, there remains a gap in knowledge relating to how these systems can be applied, including in areas of biomass for bioenergy and food security.

This report provides information for the Governments of CLV, on the use and adoption of standards and certification systems[3] as policy instruments. The report thus provides important lessons to inform CLV Governments' decisions in relation to policy instruments that promote the uptake of specific products and services[4] which contribute improved utilisation of biomass for bioenergy and food security.

It should be noted that other initiatives are also required to improve utilisation such as reducing the cost of production through improved technology and improvements in the collation of biomass (such as through a collection system). Governments can also provide support and design policy instruments in these areas but these are not covered in this report.

The structure of the report is as follows:

---

[2] In the short-term development of national standards may be more achievable, given the extensive dialogue and agreement that will be needed to agree on regional standards.

[3] Which include labelling which 'advertise' compliance to a standard

[4] Which will initially be laid out as a policy matrix to be presented at a regional forum in late 2013 or early 2014. Based on this policy matrix, the Project can then support implementing agencies in developing standards and certification systems for priority products and services.

- Chapter 2 provides information on standards - their definition, their role, types, uses, the components of a standards system and lessons learned;
- Chapter 3 provides similar information on certification;
- Chapter 4 provides similar information on labelling;
- Chapter 5 provides evidence on the impact of sustainable standards and certification systems from case studies from across the world;
- Chapter 6 provides considerations for government in using voluntary standards and certification as policy instruments and in regulatory framework development;
- Chapter 7 provides conclusions as well as a way forward for determining the need, and initiatives, for implementing standards, certification and labelling to improve the utilisation of biomass for bioenergy and food security in CLV.

Throughout the report, reference is made to sustainability standards and systems, including for biomass and bioenergy. Additional examples of such systems are provided in appendices:

- Appendix 1 lists and describes various, though in no way exhaustive, voluntary and certification schemes for bioenergy, general sustainability planning frameworks, tools, and indicators that could aid domestic policymakers in designing appropriate strategies to pursue bioenergy policies and programs in their countries;
- Appendix 2 lists and describes climate-friendly agriculture standards and sustainable farming certification programs;
- Appendix 3 investigates eco-friendly labelling and sustainability certification programs;
- Appendix 4 presents implementation experience in the Greater Mekong Subregion on selected sustainability standards;
- Appendix 5 deals with standards harmonization and regulatory convergence. Some examples are given, including the processes necessary and institutional arrangements established for the development of harmonized standards and labelling systems, and, where information is available, the progress so far of these initiatives;
- Appendix 6 lists references used in the report.

2. STANDARDS

2.1. WHAT ARE STANDARDS?

Standards are specifications or criteria for the production or manufacture, use, and/or attributes of a product, process, or service. They may contain requirements that ensure product safety and information that clarifies health and environmental risks.

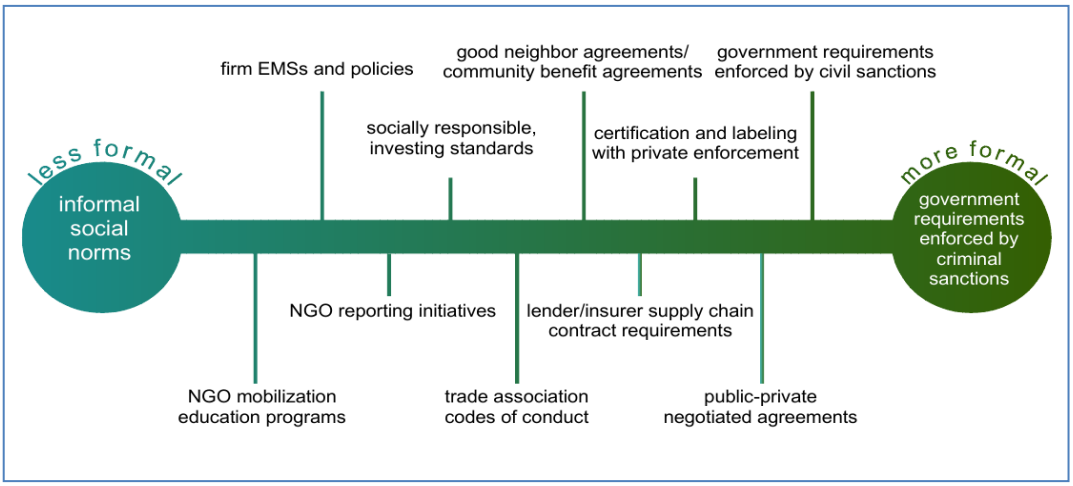
2.2. ROLE OF STANDARDS

Standards increase transparency in the market and reduces information search costs (i.e. they provide assurance against certain specifications or criteria), create and assure compatibility (e.g. between electronic components), coordinate technology, and coordinate markets through complementary products. Their role is to increase the information available for consumers, to increase their knowledge of the attributes of products and services, and reduce uncertainty of a product's or a service's fit to their needs and expectations.

2.3. TYPES OF STANDARDS

Standards, a type of policy instrument, can vary from formal government-enforced mandatory standards (regulations) to informal social norms, as typified in the figure below. Between these two extremes lie a range of private actor-driven actions which are sometimes called voluntary regulation. These are predominant and are currently driving the standards movement globally. Many systems of standards have evolved by the addition of new dimensions to them effectively moving along the continuum between informal and formal systems.

Figure 2: Typology of policy instruments to improve sustainability of production-consumption systems



Source: Steering Committee of the State-of-Knowledge Assessment of Standards and Certification (2012)

2.3.1. Mandatory Standards (Regulations)

Direct government regulation is regarded as the strongest form of control of behaviour of economic actors. Regulations usually focus on areas of public concern, and are issued within the framework of legislative policies and goals. Regulations are mandatory (and thus often referred to as

mandatory standards[5]), and non-compliance is subject to formal penalties and legal sanctions (although industry associations can also impose penalties and sanctions). Governmental action in this form is likely to be most effective, and have legitimacy and credibility.

Governments, however, generally lack know-how to establish detailed standards for resource extraction, agricultural production and manufacturing production. There is thus significant benefit in collaborating with stakeholders and expected actors for information sharing and gathering, and building ownership and capacity to operate the proposed scheme.

Regulation may be used to ban product constituents (e.g. mercury) or production processes (e.g. clear-cutting), but this approach does not easily lend itself to codification of best practices that would need regular revision to be up-to-date or current (e.g. a standard for a manufacturing process). Moreover, the process of development and amendment is cumbersome and lengthy. While public participation and having the possibility to challenge regulatory decisions increase its legitimacy, the process can take years. The legal framework for regulations at the international level for products and production processes essentially has the same features.[6] A good example of standard systems which have been adopted as regulations in many countries for certain high risk product groups or industries are the **Good Practice Systems (GxP)**.

Good Practice is a system for ensuring that products are consistently produced and controlled according to quality standards. The system is designed to minimize risks associated with the manufacture of a certain product that cannot be eliminated through testing the final product. GMP covers all aspects of production, from the raw materials, the manufacturing premises and equipment, to the training and the personal hygiene of the staff or workers. Detailed, written procedures for each stage of the production process must be complied with. Documentary evidence are compiled to show that procedures have been correctly followed.

Good Manufacturing Practices (GMP) are used by pharmaceutical, medical device, and food manufacturers, as well as veterinary drug producers, to ensure quality and safety of products. Regulations on product quality, consumer safety, and efficacy were developed as a reaction to industrial accidents and tragedies over the past 100 years or so.[7] In many countries, GMP regulations have been issued as the minimum requirements, and require that imports of such products into their territories comply with the these regulations.

Other examples of Good Practice Systems include Good Agricultural Systems (GAP), Good Distribution Practice (GDP), Good Research Practice (GRP), among many others. Collectively, these and other good-practice requirements are referred to as GxP requirements, all of which follow the same principles[8].

2.3.2. Voluntary Standards

Multi-stakeholder voluntary initiatives, including for social and environmental sustainability standards, range from non-committing platforms for dialogue and exchange of experiences to standard setting and accreditation.[9] The initiatives may be led by a range of stakeholders or

[5] *The term standards usually refers to voluntary standards to differentiate from regulations (mandatory standards).*
[6] *NAS (2010)*
[7] *http://www.ispe.org/gmp*
[8] *http://en.wikipedia.org/wiki/Good_manufacturing_practice*
[9] *Lang (2006)*

participants of a given industry, including industry players themselves, civil society, advocacy groups, the academia, and consumers. Some of these informal mechanisms exist for a limited duration of time, set up as a consultative group to review existing status, and suggest guidelines and standards. An example is the World Commission on Dams which existed only for a certain period, and was tasked to review the effectiveness of dams, and to suggest guidelines and standards for dam building.[10] Other types of voluntary initiatives are explained below.

Codes of Conduct: The establishment of ethical codes of conduct emerged as a trend in Western companies in the 1990s. The growth in corporate concern for ethical practices in their production or manufacturing suggested that Western consumers and stakeholders were becoming aware of the conditions in the developing countries where most of consumer goods are produced. This awareness, in turn, led to consumers demanding social responsibility from companies for their production and supplier chain wherever in the world it takes place. Corporate social responsibility (CSR) has been approached as a strategic tool to improve business, although the relation between CSR and profits remains uncertain.[11] The major problem of companies adopting Codes of Conduct, however, was that they had no guarantee that operators along their supply chain actually conform to the Code.[12] Codes of Conduct may be initiated by a company or organization and limited to its business, or can be initiated at the industry level and apply voluntarily across its entire supply chain.[13] Codes of conduct are an example of a dialogue platform that brings together private sector, labour (trade unions), government and non-government organizations for an exchange of experiences, and identification of best practices to introduce codes of conduct. The Ethical Trading Initiative (ETI) is another example. ETI functions as a forum dialogue that include corporate, trade union, and NGO members, but with a common base code identified and the commitment of corporate members to report on their progress in implementing the code.

Other multi-stakeholder initiatives: Some informal mechanisms may progress into more formal mechanisms, as in the case of certain sustainability standards (such as for biofuels), as well as for biofuel crop production (such as for palm oil). They go further in defining and establishing and agreeing on definitions and criteria, and committing to their implementation. These standards were developed through stakeholder initiatives that started as informal roundtable discussions (hence the term roundtable, e.g. Roundtable on Sustainable Palm Oil) or meetings among an initial group of stakeholders (usually producers) and expanding to include other interested parties, to deal with sustainability issues. This eventually resulted in the group's formalization, and the establishment of certain principles and criteria (see 2.4.5) which would differentiate sustainably produced goods from conventionally or less sustainably produced ones (e.g. biofuel crops grown on areas with high ecological value as against biofuel crops grown on land which has marginal ecological value). These principles and criteria constitute the standards that must be adhered to, and guaranteed through a certification scheme that the organization either administers or provides accreditation to certifiers for.[14]

---

[10] Fernholm (2006)

*[11] Fernholm (2006) quoting Mohr. Wording of the preamble of the EICC Code of Conduct (see footnote 10) gives an idea of why such guarantee is uncertain, i.e. "…The Code **encourages** (emphasis added) participants to go beyond legal compliance, drawing upon internationally recognized standards, in order to advance social and environmental responsibility and business ethics…"(p.1)*

[12] Fernholm (2006)

[13] An example of an industry-wide Code of Conduct is that established by the Electronic Industry Citizenship Coalition (EICC), which has been updated to its 4th version in 2012. For the full text of the Code, see http://www.eicc.info/documents/EICCCodeofConductEnglish.pdf.

[14] See Section 2.4.5 and Appendix 1.

Some initiatives later on constituted themselves as organizations, such as the Forestry Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification Schemes (PEFC).

This multi-stakeholder process of agreeing to a set of standards that is applicable worldwide was an approach that gained ground in the 1990s. It turned to market mechanisms, rather than government authority, to encourage producers and consumers to behave responsibly. These multi-stakeholder processes also provided a mechanism for what is called "collaborative engagement". An example of this strategy is NGOs supporting buyer's groups like big furniture companies (e.g. Ikea) to commit to buying only FSC-certified wood.

2.3.3. Product vs. Process Standards

Standards can either be *product* or *process* standards. A *product* standard is a set of criteria with which a product must comply. Product standards in the agriculture sector include quality standards relating to appearance (shape, colour, grade, etc), the nutritional contents or the absence (or very low levels) of undesirable elements (e.g. contaminants, pesticide residues). A *process* standard, on the other hand, is a set of criteria for the production process (e.g. prohibited use of agrochemicals and obligation to maintain soil fertility in organic agriculture).

Process standards can either be management system standards or performance standards. Management system standards set criteria for management procedures (e.g. procedures for documentation or for monitoring), but do not set criteria for the performance of the management system in terms of its effect in the field (e.g. better yields). An example of a management system standard is the ISO 14000 family of standards for environmental management. Performance standards, however, set verifiable requirements for certain criteria (e.g. non-use of specific pesticides). An example would be the Rainforest Alliance's sustainable agriculture standard.[15]

2.4. USE OF STANDARDS

2.4.1. Mandatory Standards (Regulations) as a policy tool

The development of a regulation is not an end in itself. It is a tool (or instrument), among a range of public policy tools, which can be employed to address societal problems. The rationale for public policy is to correct market failures. The four traditional market failures are: public goods, externalities, natural monopolies, and information asymmetries. Many environmental problems are the result of a combination of two or more of these types of market failures.[16]

Using agriculture as an example, farming can result in negative environmental impacts on others besides the individual farmer engaged in the production, e.g. pesticides in rivers from runoffs (externalities). Urban consumers of this farmer's produce would have no way of knowing whether or not it was produced in an environmentally sustainable way (information asymmetry). In this example, water quality is a public good (it has properties of non-excludability and non-rivalry): a person's utilization of clean river water downstream (free of pesticide run-offs) for bathing does not reduce the river's water quality for others to enjoy. To address this particular environmental problem, the government may implement a regulation limiting the use of pesticides in farm produce through setting minimum standards for compliance.

[15] *Liu (2009)*
[16] *Matus (2009)*

2.4.2. Standards as a business strategy

a) Differentiating a product

As discussed in chapter 1, one of the main uses of standards is to differentiate a product from other similar products. This helps to address issues of information asymmetry. i.e. where the customer does not have the information to enable him/her to differentiate between products, in terms of attributes which are not obvious. Organic foods are a good example. Just by looking at two vegetables in a shop, a customer will not know which one is organic and which one not. He/She may be prepared to pay more for the organic produce but by being unaware of the difference between the two vegetables, he/she will eventually make an uninformed choice. The premium may thus be effectively lost and the producer surplus reduced. Whereas if the product has a label which provides assurance to the customer that the product meets a particular standard, then he/she will be able to differentiate between them, and thus may decide to pay or not pay a premium.

b) Increasing market access

Large-scale buyers exert a significant amount of influence by demanding certified products (according to certain standards) from their sources. Producers who can meet the requirements (e.g. for organic or fair-trade products) have greater assurance of large, stable, and long-term contracts. For producers, this market access may help justify higher costs of being certified. Two of the potential benefits of adoption of a standard (and certification to it) are thus guaranteed long-term contracts and increased market access. Some large retailers now require their suppliers to have certification to a standard (e.g. Home Depot, a large US furniture seller, requiring Forestry Stewardship Council (FSC)-certified timber). Procurement and long-term contracts may be important in facilitating markets for certified products. For some schemes, targeting large-scale buyers and procurement policies of government and firms, not just focusing on households, is the preferred path to long-term sustainability.[17]

c) Transforming business practices

Standards (if they are complied with – see Section 3: Certification) can transform business practices through more responsible production, sourcing, and manufacturing. Positive impacts for business include improved efficiency within the supply chain through better managed processes, higher production and better quality, cost savings, higher transparency, decreased risk, and better awareness about problem areas in the supply chain.[18] Standards may also aim to mitigate risks (e.g. social unrest and regulatory action). Standards may also raise the bar in the sector which then motivates other actors, as was the case in the Leadership in Energy and Environmental Design (LEED's) standard for green buildings[19] which prompted a change in government regulations[20]. Standards are used to benchmark the most sustainable practices within an industry. Within a certification system for voluntary standards, however, there is no mechanism to eliminate the worst performers. Non-compliant producers could choose to remain in the marketplace without changing practices. Standards thus contribute to market differentiation, but not a transformation.

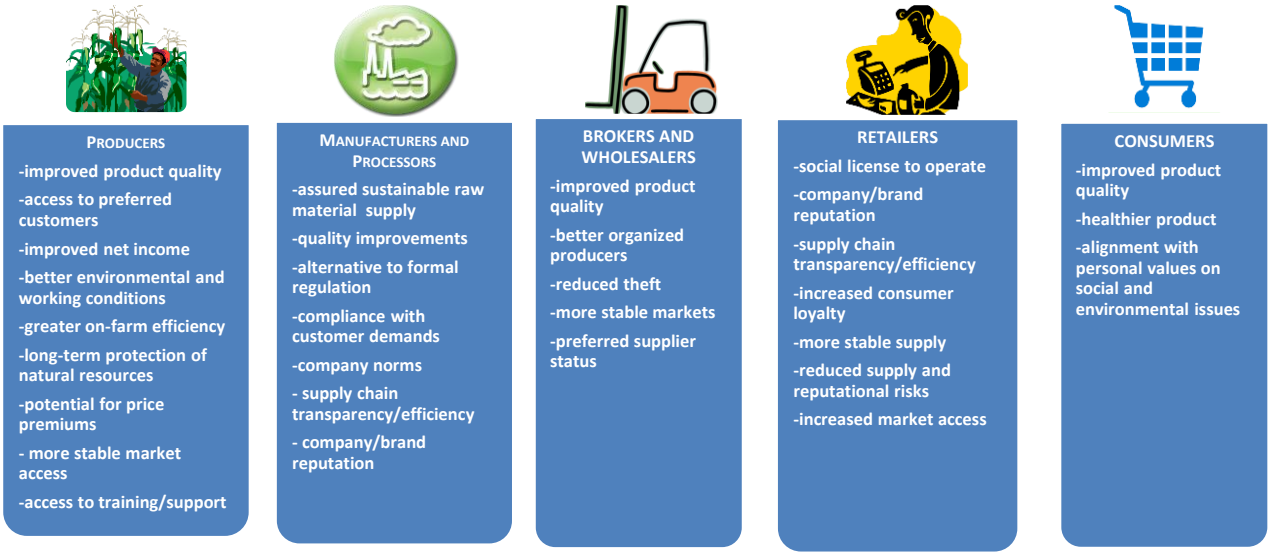
[17] *Vollmer (2010) citing UNEP 2005*
[18] *Elbehri et al. (2013)*
[19] *NAS (2010)*
[20] *Note that the LEED standard is one of the most well documented examples in sustainability standards literature. Other environmental standards (e.g. for pollution) have evolved differently and agricultural standards (except for food safety requirements – SPS), such as for organic agriculture, have not yet led to governments actually adopting them as mandatory regulations.*

Ethical Codes of Conduct, described in the previous section, is a good illustration of the use of these informal standards as a business strategy.

2.4.3. Standards as an advocacy tool

Advocating certain actions gave rise to the development of standards and certification, notably in the environment area. The rise in sustainability schemes can be traced to initiatives by NGOs in the 1980s to protest against environmentally harmful practices in the forestry sector, and the unfair labour practices of the Nike Company. Friends of the Earth, the Rainforest Action Network, and Greenpeace led boycott campaigns against these issues and generated media coverage, public awareness and political leverage. Alternatives for operations, however, were difficult to identify, and attempts to pass international frameworks failed. Against this background, NGOs began to develop standards and promote certification systems focusing on sustainability, as a less confrontational form of social and environmental activism.[21]

Figure 3: Value chain actors and their motivation to adopt standards



Source: Steering Committee of the State-of-Knowledge Assessment of Standards and Certification (2012)

2.4.4. Standards in international trade policy

Do standards promote or hinder trade? In the absence of a multilateral consensus on the appropriate level or setup of standards (e.g. within WTO or WCO), international standards provide common reference points for countries to follow in order to reduce transaction costs (e.g. ISO Standards). They provide the basis for countries to choose norms that are recognized in foreign markets. In this respect, conformity to such standards increase export opportunities. The opposite outcome may also be true – despite their potential to expand trade, standards can restrict competition and trade through raising the compliance costs of firms (e.g. of new entrants and foreign suppliers). The negative effect on trade occurs when governments adopt technical regulations or sanitary and phytosanitary standards (SPS) that favour domestic producers, or apply them in a way that discriminates against foreign suppliers.[22]

[21] *Steering Committee of the State-of-Knowledge Assessment of Standards and Certification (2012)*
[22] *Wilson (2008)*

The World Trade Organization (WTO) agreements set the governing framework for international trade and member countries of the WTO are legally bound to comply with the provisions of the Agreements. The relevant WTO agreement for dealing with standards and labelling is the Technical Barriers to Trade Agreement. The Agreement deals with the development and implementation of mandatory technical regulations by governments. It also covers development of standards and conduct of conformity assessment by private bodies.[23] Standards, however, by becoming too stringent or discriminatory can inhibit trade. If a country (WTO party) that is subject of a trade complaint by another country and found by the WTO Panel to be using standards as a barrier to trade, then it violates the provisions of the two relevant WTO Agreements (SPS and Technical Barriers to Trade (TBT) Agreements) and will be penalised accordingly. In short, within the framework of international trade law, standards are supposed to be used in in order to facilitate trade, and not in a manner that hinders it or are adopted as measures to disguise protectionism.[24] While there are distinct references to standards and standardizing bodies in the TBT Agreement (Article 4 and Annex 5 Code of Good Practice for the Preparation, Adoption and Application of Standards) there is uncertainty on how they apply to private sector-led standards. Trade practitioners and observers acknowledge that the Agreement has significant limitations in addressing this type of standards and voluntary labelling (Appleton 2009, Bernstein 2008, Gascoine 2006). The problems arise from definitions and interpretations of the Code. Specific issues include scope of the Code, imprecise definitions of terms (such as "recognized body"), and lack of provisions (such as for "non-governmental bodies").[25]

Are voluntary standards compatible with international trade law? The prevalent interpretation is that the current WTO Agreements do not provide clear and definitive guidance on the treatment of voluntary standards. The existing case law on labelling gives an idea of how future trade disputes may be decided by the WTO judges on the basis of precedence, but as each decision is specific to the case and does not establish the rule, deriving conclusions from this is not a reliable exercise.

An additional complication arises from the fact that many of these voluntary standards are based on non-product related production and processing methods, which are not disciplined by the Technical Barriers to Trade Agreement. Developing country members are hesitant to open a discussion on non-product related production and processing methods because it would necessarily raise issues on labour and environmental practices, considered to be politically sensitive areas. In the absence of an agreement among the members, as well as an examination and determination by a WTO panel on the above issues, the question of whether standards are governed by international trade rules is still not settled.[26] Proposals have been suggested on developing a plurilateral or a separate agreement that deal with how private-led standards are to be treated in the WTO. Others suggest leaving the current global standards regime as it is, with minimal regulation from the WTO.[27]

[23] Annex 1(2) of the Technical Barriers to Trade Agreement defines standards as *"a document approved by a recognized body that provides for common and repeated use, rules, guidelines or characteristics for products or related processes and production methods, with which compliance is not mandatory. It may also include or deal exclusively with terminology, symbols, packaging, marking or labelling requirements as they apply to a product, process or production method."*

[24] Dismantling protectionism (protection of domestic industries through erecting domestic regulation, policies, or measures that have direct or indirect impact on ability of foreign exporters to access this market) is one of the primary aims of WTO.

[25] *Appleton (2009)*

[26] *Baracol-Pinhão (2011)*

[27] *Bernstein (2008)*

2.4.5. The use of standards for sustainable production

Voluntary standards for sustainable production trace their roots to the standards set by the organic movement in the early 1920s which emerged from local standards developed by farmer groups themselves. Over time, these local **organic standards** were consolidated into a more unified interpretation of organic agriculture expressed in principles and criteria. In 1972, these various initiatives formed themselves as a network called the International Federation of Organic Agriculture Movements (IFOAM). This approach to development of standards, wherein multiple, existing local standards were brought together under a common standard occurred only in the organic sector and in two other instances – fair-trade and sustainable tourism.

Other sustainability standards emerged through initiatives led by a small group of non-profit organizations to bring together and engage a range of stakeholders within a given sector. More notably, retailers and manufacturers were involved in the standards development process. The FSC was the first to adopt this approach. In the early 1990s, NGOs had started to lead advocacy campaigns against the destructive practices of forestry companies in the Amazon and other tropical forests. Parallel efforts to establish international forestry agreements, however, failed. NGOs, including the World Wide Fund for Nature (WWF), then convened a number of companies who were willing to negotiate and support an agreement. They agreed to **a set of principles and criteria (i.e. standards) for the responsible management of forests**, paving the way for the establishment of the FSC in 1993. The formation of the FSC also encouraged the development of alternative programs such as the Sustainable Forestry Initiative (SFI), and the Programme for the Endorsement of Forest Certification (PEFC). At around the same time, other multi-stakeholder systems focusing on the sustainability of natural resource-based products were also developed. An example is the Marine Stewardship Council (MSC) established in 1997 to promote **sustainable fisheries**.

A core group of these systems, including FSC, MSC, RA–SAN, and IFOAM, came together in 1999 and decided to cooperate formally. They formed the ISEAL (International Social and Environmental Accreditation and Labelling) Alliance in 2002. ISEAL aimed at promoting greater cooperation between members and working toward greater recognition of voluntary systems. ISEAL has grown since then, with the focus now being on improving the effectiveness and promoting wider adoption of these sustainability schemes.

Commodity roundtables which emerged in 2004 had a different approach to standards development. These roundtables focused on specific commodities that have significant impact on the environment (e.g. palm oil and sugar), unlike previous systems that focused on sectors (e.g. PEFC on forestry), and on issues (e.g. fair-trade on labour). The roundtables involved a greater number of leading industry players – a fact which raises the concern among NGOs that the standards reached through this process are less rigorous and are collaborative initiatives rather than best practice standards. See further in section 2.3.2 above.

Bioenergy Standards: Global biofuel production has increased significantly in recent years, with the highest volume recorded so far in 2010 at 23 billion gallons in more than 40 countries.[28] In 2011, the value of the global biofuels market reached USD82.7 billion.[29] US ethanol produced from corn, and Brazilian ethanol from sugar, are the two biggest contributors to this trend. Other leading producers that are driving this growth are the EU countries, China, Thailand and Canada.

[28] *http://www.afdc.energy.gov/data/#tab/fuels-infrastructure/data_set/10331*
[29] *http://cleantechnica.com/2012/02/20/report-global-biofuels-market-could-double-to-185-3-billion-by-2021/*

Behind this global growth is the perception that biofuels are a "triple-win" solution to lower greenhouse gas (GHG) emissions, enhance energy security, and promote rural development. Many governments have thus introduced domestic incentive programs as well as blending mandates or targets to support biofuel production and use. As of late 2012, blending mandates or targets were in place in 60 countries, most of which come from the EU27.[30] A global biofuels system has thus emerged which features the following: global trade, global investments, and global standards.[31]

Biofuel use aims to achieve climate, energy, and economic goals, but also poses various risks. Higher food prices have been blamed on biofuels, and the carbon mitigation potential of biofuels has been questioned by critics. The negative impacts of intensive land use and conversion on conservation and ecosystem services, and on the livelihood security of small farmers also cause increasing concern. All these issues have brought a new dimension into the entire bioenergy debate: the issue of sustainability.

Sustainability issues in bioenergy revolve around the following aspects: its environmental, economic, and social impacts. The figure below lists some of the impacts that are associated with bioenergy production and use. It also lists the indicators for each set of criteria included in most sustainability schemes that address the impacts.[32] The impacts may be direct or indirect, also called displacement or "leakage" effects.[33]

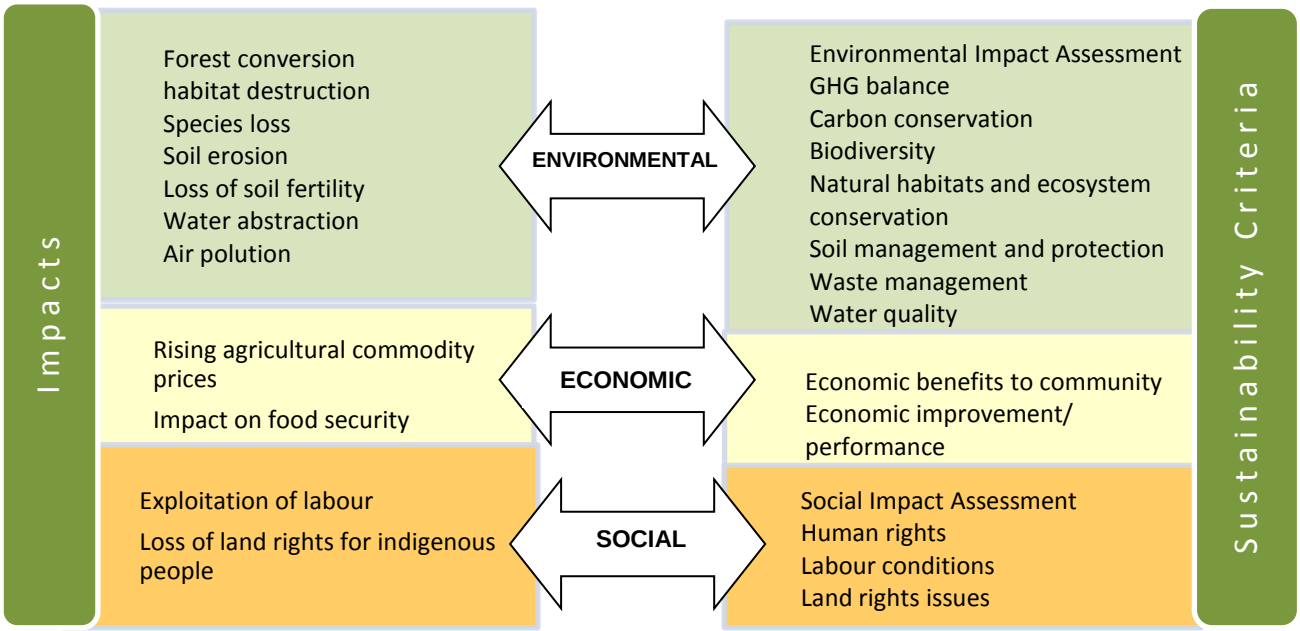
Bioenergy sustainability standards are presented as a hierarchy of Principles, Criteria, and Indicators. Other standards (e.g. FSC, RSPO, MSC) also follow this generic structure.[34]

1. Principles (1...)
   1.1 Criteria (i...)
   1.1.1 Indicators and verifiers (a...)

The principles are the overarching goals that encompass the general aspirations stated in broad terms. The criteria translate the principles into concrete terms, and outline the steps necessary to comply with the principles. Under each criterion are indicators to enable verification and auditing.

[30] *http://www.biofuelsdigest.com/bdigest/2012/11/22/biofuels-mandates-around-the-world-2012/*
[31] *Lin, J.S.W. (2011)*
[32] *Lin (2010) citing Clay*
[33] *Dehue (2007)*
[34] *http://www.worldenergy.org/documents/annex8sustcritrgbelg.pdf*

Figure 4: Environmental, social, and economic impacts of bioenergy and sustainability criteria



Bioenergy sustainability schemes are all very recent. The voluntary initiatives began in 2004 as roundtable discussions (starting with the Roundtable for Sustainable Palm Oil (RSPO)), after which standards were developed. The process of standards development, including drafts and piloting usually took an average of three years. Many of them are still in the process of developing criteria and are only in the initial stages of implementation in areas where they can already be applied. The schemes can be commodity based (e.g. the Roundtable for Responsible Soy Production (RTRS)), or based on the end product (e.g. EU– Renewable Energy Directive (EU-RED)). In terms of governance, they can be mandatory, i.e. regulatory frameworks developed at the regional (e.g. EU–RED), national (e.g. UK–Renewable Transport Fuels Obligation), or local (California's Low Carbon Fuel Standard) levels or voluntary. Voluntary schemes have mostly been developed through roundtable initiatives (e.g. RSPO) that brought together a range of stakeholders from around the world. Like RSPO, in most cases they were initiated by big players in the industry. **Appendix 1** presents an overview of selected sustainability schemes in the bioenergy sector, including initiatives for household technologies, framework life cycle analysis, and tools for bioenergy planning.

The table below provides details of the sustainability criteria applied to selected existing schemes. These schemes provide a broad coverage of a large number of criteria although some more specific issues may not be addressed. Indirect effects, food availability, food security are not addressed in all schemes. Mass balance and energy balance are rarely addressed, and if so, are indicated as energy efficiency. Various schemes accept the operation of three supply chain systems (also called material tracking): segregation/identity preserved, mass balance, and book-and-claim. A set of additional requirements include chain of custody, accreditation and verification requirements (e.g. RSB, RSPO).[35] This demonstrates the complexity of the criteria that some schemes operate under.

[35] *Scarlat and Dallemand (2011)*

Table 1: Coverage of selected sustainability schemes

	Regulatory frameworks	Planning frameworks & tools	Voluntary schemes and initiatives						
SCHEME	EU–RED	GBEP	ISCC	RSB	BSI	FSC	GlobalGAP	Fairtrade	IFOAM
Scope	Biofuels	Bioenergy	Bioenergy	Biofuels	Sugarcane/biofuels	Forest	Agriculture	Agriculture	Organic products
Operation	Meta-standard		Meta-standard	Meta-standard					
Material tracking [a]	+		+	+	--	+	+	+	+
Indirect effects [b]	*Will address*	*Will address*	--	*Will address*	--	--	--	--	--
Food security	*To monitor*	+	+	+					
ENVIRONMENTAL									
GHG	+	+	+	+	+	--	--	--	--
GHG REDUCTION REQUIREMENT	+		+	+	+				
Land use change	+	+	+	+	+	--	--	--	--
Indirect land use change [c]	--		+	*Will address*	--	--	--	--	--
Carbon conservation	+	+	+	+	+	+		+	
Biodiversity conservation	+	+	+	+	+	+	+	+	+
Soil conservation		+	+	+	+	+	+	+	+
Sustainable water use	+	+	+	+	+		+		+
SOCIO-ECONOMIC									
Economic development		+	*None*	+	+	+		+	
Social aspects	*To report*	+	+	+	+	+			+
Labour conditions		+	+	+	+	+	+	+	+

Notes:

a. indicated scheme uses one or more of the following approaches: segregation, mass balance, book-and-claim, and energy balance

b. e.g. rise in commodity food prices

c. displacement of previous productive use of land

Source: Adapted from Scarlat and Dallemand (2011), with updates (30 June 2013) in red italics.

Some of these schemes operate to meta-standards, on which national or other private standards can be based. A meta-standard thus serves as a benchmark standard – with schemes then developing national interpretations of their principles and criteria. This is to ensure the applicability of the criteria at the country level that take into account local conditions and requirements. Producers are not required to be certified to the meta-standard directly. Instead, compliance to the standard is achieved through existing standards. There, the certification program has to be a guarantee that the principles and criteria of the meta-standard are complied with. An example of a meta-standard is the Roundtable for Sustainable Biomaterials (RSB) standard.[36] **Appendix 1** lists and describes the features of some of these meta-standards.

Greenhouse Gas (GHG) balance is the most important environmental indicator for assessing bioenergy environmental sustainability criteria. A biofuel's GHG reduction potential reduces significantly with any conversion of grasslands and forests into agricultural land. Biomass production impacts on biodiversity in both positive and negative ways. When degraded land is used, species diversity might be enhanced. On the other hand, large monocultures of energy crops can cause habitat loss, expansion of invasive species and contamination from fertilizers and herbicides. A significant difference between the (newer) bioenergy schemes and the other schemes is the absence of most of the GHG-related criteria required for bioenergy, except for the material tracking criteria which can be found in their traceability requirements. This is because such schemes such as for organic agriculture were developed for altogether different purposes and contexts. The GHG emission standards methodology appears in the recently developed systems for bioenergy, though default values for the calculation of the GHG balance differ between them. These methodological differences are evident in biodiversity conservation criteria, which are included in all of the systems but are quite ambiguous in terms of interpretations of what is a biodiversity-rich area.[37]

Soil and water conservation are widely addressed, however, the focus is limited to the local level and the system boundary is the production unit. Current criteria, however, do not take into account the cumulative effects of changes in the water use on the meso or macro level, as well as activities outside the production unit that may affect water resources within it. While soil conservation is being promoted as best practice although experience shows that adoption is usually very slow.[38]

Some schemes require Environmental Impact Assessments to be completed as defined by the relevant legislation in force. The most sensitive issues are those related to competition for raw materials (e.g. fuel vs. food, feed or fibre) and land use changes. Increased use of land for biofuel crops might lead to land use changes, crop displacement, deforestation, and a host of other effects. Competition for land to grow biomass feedstock (thus reducing land available for crop production) could lead to higher food prices and lower availability. The question is - to what extent can adherence to bioenergy standards prevent negative land use change. Indirect effects are the most complex criteria as they have both global dimensions, are governed by different national sector policies, and involve complex market interactions. It is thus difficult to reach consensus on a methodology that is both effective and acceptable to all stakeholders. In some cases, there might be issues that certain stakeholders are not willing to discuss or explore further as they involve potential costs or losses of benefits. An example is indirect land use change which requires identifying the link between local feedstock production and land use change occurring elsewhere.

[36] *Dam et al. (2010)*
[37] *Van Dam et al. (2010)*
[38] *FAO (2013)*

The lack of practical experience on which to base recommendations poses a problem for defining criteria for indirect land use change.[39]

A Social Impact Assessment is required in most schemes to assess the social impacts of bioenergy production. Some initiatives, however, do not make fulfilment of socio-economic criteria obligatory (e.g. in UK–RTFO). Social sustainability labour-related criteria, including working conditions, are usually referenced to the International Labour Organization's (ILO's) labour conventions, or include provisions of these conventions directly.

Since bioenergy sustainability programs are very new (some are even in the development stages only as of this writing), their overall impact cannot yet be assessed. Initial lessons, however, are being borne out in the experience of Brazil in its ethanol program. A recent study on the effect of sustainability programs on biofuel production in Brazil challenges the idea of the central importance of market benefits as the driving force behind private regimes for environmental and social governance. Findings bear out the assumption that sustainability certification is seen as a polycentric institution that facilitates interactions between many actors, and where the involvement of large-scale purchasers and of environmental and social NGOs are essential supplements to government institutions in setting and enforcing the legal framework.[40]

European Union – Renewable Energy Directive (EU-RED)

The Renewable Energy Directive (RED), which is part of the EU Energy and Climate Change Package adopted by the European Council, entered into force in June 2009 and was required to be transposed to national legislation by member states by December 2010. The package calls for a goal of 20/20/20 for the year 2020.[41] The sustainability EU–RED criteria are mandatory for all biofuels, whether produced internally or imported, in order to receive government support or to count toward mandatory national renewable energy targets.[42] The member states are responsible for verifying compliance with the sustainability criteria, but the EU can recognize voluntary certification schemes. Member states cannot lay further requirements than that required by the Single Harmonized Scheme.[43] Biofuels for export to the EU and EU companies have to demonstrate compliance with the EU–RED through certification with any of the following: voluntary schemes recognized by the Commission for five years, Member State Schemes (national systems), or through bilateral or multilateral agreements. Since July 2011, the EU has recognized 14 voluntary schemes.[44]

In the absence of an EU-wide sustainability scheme for biomass other than biofuels or bioliquids, used in electricity, heating, and cooling, EC recommends that national schemes for solid and

[39] *Scarlat and Dallemand (2011)*
[40] *Zuzza (2013)*
[41] *i.e. 20 percent reduction in GHG emissions compared to 1990, 20 percent improvement in energy efficiency compared to forecasts for 2020, and 20 percent share of renewable energy in the EU total energy mix.*
[42] *The criteria include reaching a minimum GHG emission saving, not derived from feedstock grown on land with high biodiversity value such as primary forests or on land with high carbon stocks like wetlands, or produced on peat land. Minimum GHG saving is 35 percent, increasing to 50 percent in 2017, or 60 percent if produced in new facilities. The RED also covers other environmental criteria for soil, water, and air quality. Although no criteria for social sustainability are included, the EC is required to report on the social aspects and the impacts on food prices. A common methodology for the calculation of GHG performance of biomass in the conversion is also set out, with similar targets as that for biofuels. Biomass sustainability in the EU is covered by forestry-related sustainability frameworks and cross-compliance rules for agriculture.*
[43] *Scarlat and Dallemand (2011)*
[44] *As of May 2013, there are 13 recognized schemes: ISCC, Bonsucro, RTRS, RSB, Abengoa RBSA, Greenergy, Ensus, Red Tractor, SQC, Red Cert, NTA 8080, RSPO, Biograce. Data from http://ec.europa.eu/energy/renewables/biofuels/sustainability_schemes_en.htm*

gaseous biomass comply with the same requirements provided by RED for biofuels and bioliquids. Small-scale producers (below 1MW capacity), are excluded from the application of the criteria.

In late 2012, two years after having been transposed into legislation by member states, a review of the EU–RED implementation was conducted on the effectiveness and burden of national systems in implementing the mandatory sustainability requirements and the chain of custody system for tracing sustainability claims along biofuel supply chains.[45] Findings show that states accept alternative ways for demonstrating compliance and national systems put in place do not increase the administrative burden for economic operators.[46]

United Kingdom – Renewable Transport Fuels Obligation (UK-RTFO)
The RTFO is a requirement in the UK to utilize a minimum amount of road transportation fuels derived from sustainable renewable sources. RTFO has established Sustainability Reporting and the Carbon Certification, as well as a methodology for the quantification of GHG savings based on a well-to-wheel approach that includes all significant sources of emission. Since 2008, suppliers have been required to report on both the carbon intensity and the sustainability of the biofuels they supply according to the appropriate sustainability standards of the feedstocks from which they are produced and any potential indirect impacts of biofuel production, such as indirect land use change or changes to food and other commodity prices that are beyond the control of individual suppliers. Suppliers that do not submit a report will not be eligible for RTFO certificates. These certificates count toward the fulfillment of the renewable fuel obligation at the end of the obligation period. Obligated suppliers have the option to acquire certificates from other suppliers or pay a buy-out price to the Renewable Fuels Agency allowing them to "buy out" their obligation.

Fuel suppliers are provided with the Carbon Calculator, a tool to evaluate carbon emission savings for each batch of fuel using the life cycle analysis methodology specified in the EU–RED. In December 2011, the RTFO was amended to implement the RED sustainability criteria, as well as introducing double rewards for some fuel types (e.g. those made from used cooking oil).[47]

In the last decade, there has been an increasing focus on the operating practices of the above voluntary systems. The International Organization for Standardization (ISO) developed procedures for environmental management systems and guidelines for conformity assessment that voluntary programs adopt for their certification and accreditation activities. These procedures are: ISO Guide 65 (for product certification), ISO/IEC 17021 (for process or management system certification), and ISO/IEC 17011 (for accreditation). For further details on certification see section 3 below.

2.4.6. Drivers for the use of standards

Dynamics resulting from globalization. Multinational firms, whose supply chains span countries, use voluntary standards as a strategy to deal with the challenges of globalization. These challenges include: credibility of information on the practices of geographically distant business partners, differences in regulatory standards (e.g. labour, environment), worldwide feasibility of business practices, diversity in customer demands, diversity in acceptable norms for doing business, and an increased number of stakeholders.

[45] *http://ec.europa.eu/energy/renewables/studies/renewables_en.htm*
[46] *http://ec.europa.eu/energy/renewables/studies/doc/2013_task2_red_implementation.pdf*
[47] *https://www.gov.uk/renewable-transport-fuels-obligation*

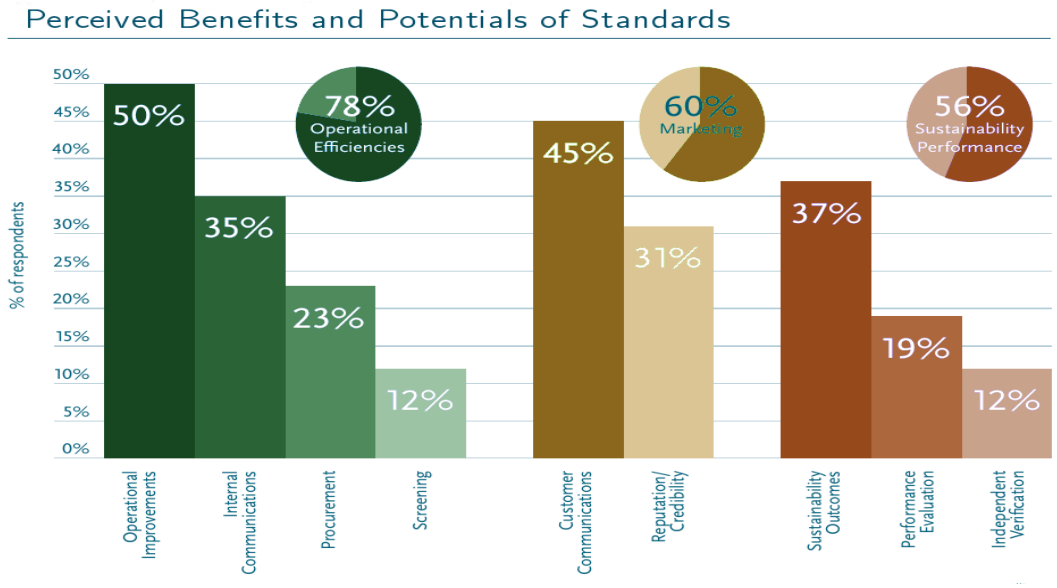
Reducing risk to individual firms. This occurs when isolated negative behaviour of one firm can have severe impacts on the rest of the firms in the sector (e.g. responsible care program of chemical industry after the Bhopal accident). Risk reduction can span a range of risks from financial, business, and attempts to avoid punative regulations.

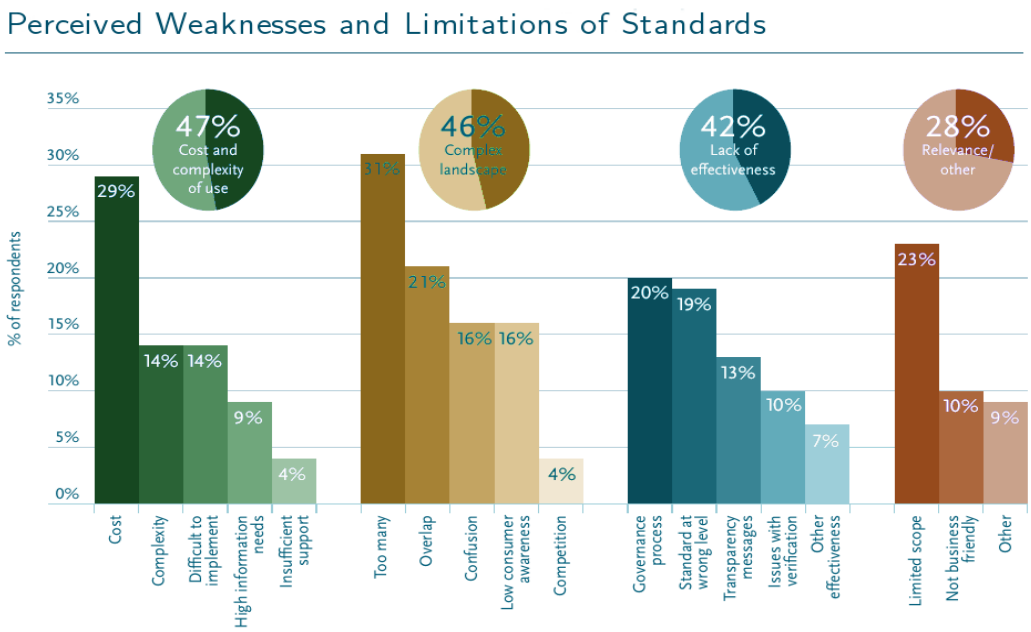
Pressure from and activity of civil society groups. Non-government organizations (NGOs) attempt to influence government regulation as well as private sector actions. Pressure from NGOs can create a strong incentive to engage in voluntary regulation, and working with them often increases the legitimacy of a firm's actions (e.g. Forest Stewardship Council).

Voluntary regulation may take the place of traditional regulation in areas where it is difficult to implement them or where they are non-existent. Voluntary regulation removes the burden of rulemaking and enforcement away from government to private or NGO stakeholders, making this option attractive in countries which may not have the expertise and finances available for traditional methods of regulation.

Emerging areas of environmental interest. This is especially true in cases where government regulation may move more slowly, or where the standard setting functions of government are diffused, e.g. Leadership in Energy and Environmental Design (LEED) green building standards that were developed ahead of the US government's move to establish building codes.

Figure 5: Perceived benefits and potentials, as well as limitations and weaknesses of standards and certification





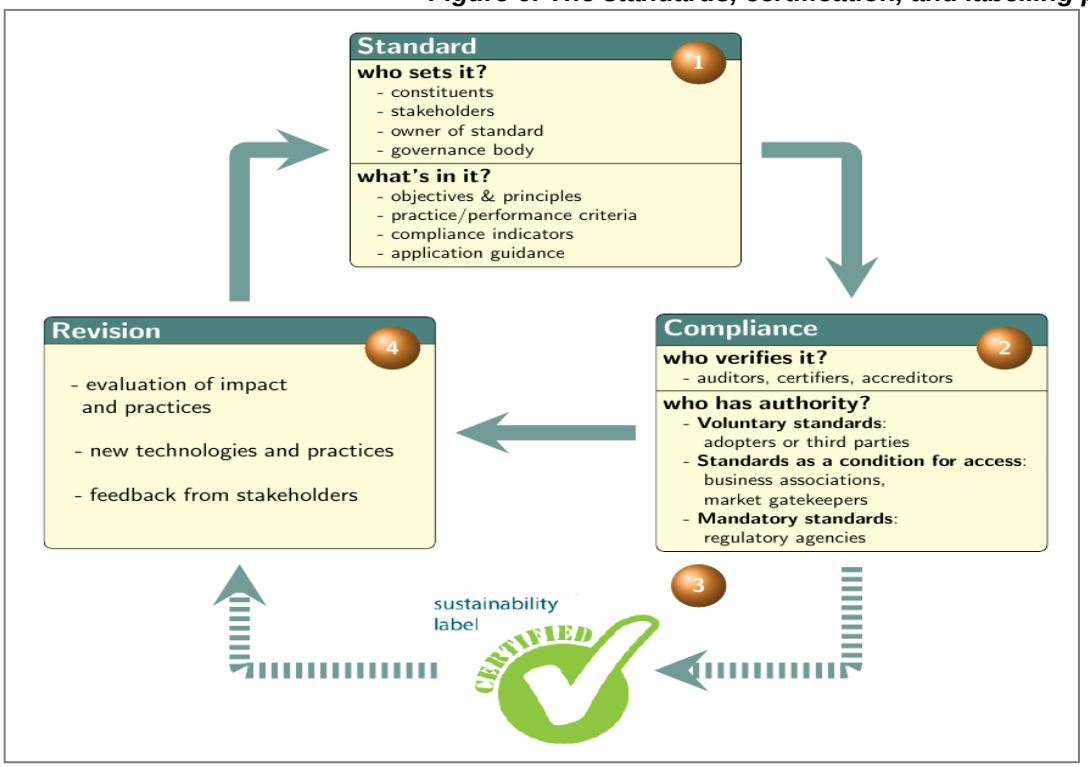
Source: Steering Committee of the State-of-Knowledge Assessment of Standards and Certification (2012)

2.5. STANDARD SETTING AND THE COMPONENTS OF A STANDARDS SYSTEM

The specification of a standard and its performance requirements is at the heart of the standards system. A process of negotiations and compromise between experts and relevant stakeholders is undertaken to come up with the content of the standard. Consultation inputs from non-technical stakeholders are usually translated by a technical advisory body into appropriate text to be included in the standard. The design of the standard is an important aspect as it has implications on how it is to be implemented and on the outcomes. This involves, for example, a decision of whether the standard should set performance thresholds or management requirements as criteria.

Linked to the standard is the need to ensure compliance against the standard which is normally achieved through a certification system. Standards, certification, and labelling are three tools that are interdependent, as highlighted in the figure below. A set of goals underlie the entire process of standardization, certification and labelling that aim at addressing a specific problem. The details of a standard influence the appropriate process for certification and the most effective method of labelling. It should be noted that not all certification leads to a label however. Certification and labelling are discussed in more detail in the next chapters.

Figure 6: The standards, certification, and labelling process



Source: Adapted with modifications from Steering Committee of the State-of-Knowledge Assessment of Standards and Certification (2012)

A well-functioning standards and certification system needs an appropriate governance structure and sustainable financing.

- **Governance structures**. Governance of standards systems is either through (a) a governance body elected by members (e.g. RSPO[48], RSB[49] or (b) an appointed, representative governance body (e.g. MSC[50]). The first model allows stakeholders to focus more on the functions of the organization rather than on whether they are adequately heard. Appointed bodies can include representatives from key stakeholder groups but they are often more streamlined. Broad stakeholder participation in such bodies is often crucial to the success of systems. Though potential conflicts of interests may arise, many standards and certification schemes have adopted structures within their organization to minimize these. An example is the FSC's three-chamber governance that aims to separate economic, environmental, and social interests to ensure that no single interest dominates the process. It is better to ask whether the standard is constructed in such a way that it meets the supposed goal.

- **Financing**. Licensing fees are one source of income from the use of product labels, certification services, and provision of trainings. Fees charged on certificates issued or volumes certified can also contribute to financing the operations of a standards system. Donor funding also plays a significant role. This is true in the development of sustainability standards, especially in their start-up and early growth stages.

[48] For more on RSPO organization structure, see http://www.rspo.org/en/organization_structure.
[49] For more on RSB organization structure, see http://rsb.org/about/organization/.
[50] For more on MSC organization structure, see http://www.msc.org/about-us/governance/structure/board-of-trustees.

Standards and certification systems do not operate in a vacuum but **interact with stakeholders** including the government, civil society, consumers and the business sector in several ways. The government in particular can support the development and implementation of such systems in ways which can increase the uptake of voluntary standards[51] by:

- *Ensuring appropriate legal frameworks are in place*. Voluntary standard systems may benefit from a strong legal framework (the push and pull mechanism as described in Chapter 1). Examples of this include the implementation of MSC standards which benefit from laws prohibiting illegal fishing. Weak, unclear, unenforced legal foundations could impede goals of compliance to a standard.
- *Formulation of policy and their enforcement*. Governments may adopt or incorporate voluntary standards into the national regulatory framework. An example is Tunisia's national organic agriculture policy which is based on IFOAM standards. Moreover, governments can favour products which adhere to a set of voluntary standards through their import and export policies. An example is Viet Nam's commitment to increase exports of certifiable farmed fish *pangasius* in the coming years. The Viet Nam government and the exporters association have committed to certify 100 percent of farmed *pangasius* by 2015.[52]
- *Government procurement*. Policies requiring products which adhere to certain standards in government purchases are a direct way of supporting the voluntary standards and certification movement. An example is the government of Japan requiring FSC certification for sustainable procurement policies.
- *Direct funding support and financial incentives*. Public funding and tax breaks can influence standards and certification. This can either be as support during the standards development process or support to producers who wish to be certified. This in essence lowers the costs of adopting a standard, thus making investments more viable.
- *Government endorsement*. Governments can influence public opinion through their endorsement of standards certification systems. Public awareness and information campaigns are ways of supporting certifiers and can facilitate the faster adoption of standards because of government's wider reach.
- *Expert role*. Governments often have considerable expertise to help in the development and implementation of standard and certification systems. Trainings, technical support or supervision are areas where the expertise of technicians in local government units, for example, can be valuable. This is especially true when donor funding has ended, and support for local producers needs to continue. The regular support provided by technicians from Vientiane Capital Department of Agriculture to organic groups in the area, well after the termination of the PROFIL project supported by the Swiss NGO Helvetas, is a good example. [53]

The typology of interactions is described in a 2012 report as follows:[54]

- *Superseding* – occurs when another governance entity takes over though the system itself remains. In this case, regulators might require compliance to criteria established by the certification system. An example is the LEED building certification program. As LEED-certified structures have demonstrated environmental, economic, and health value,

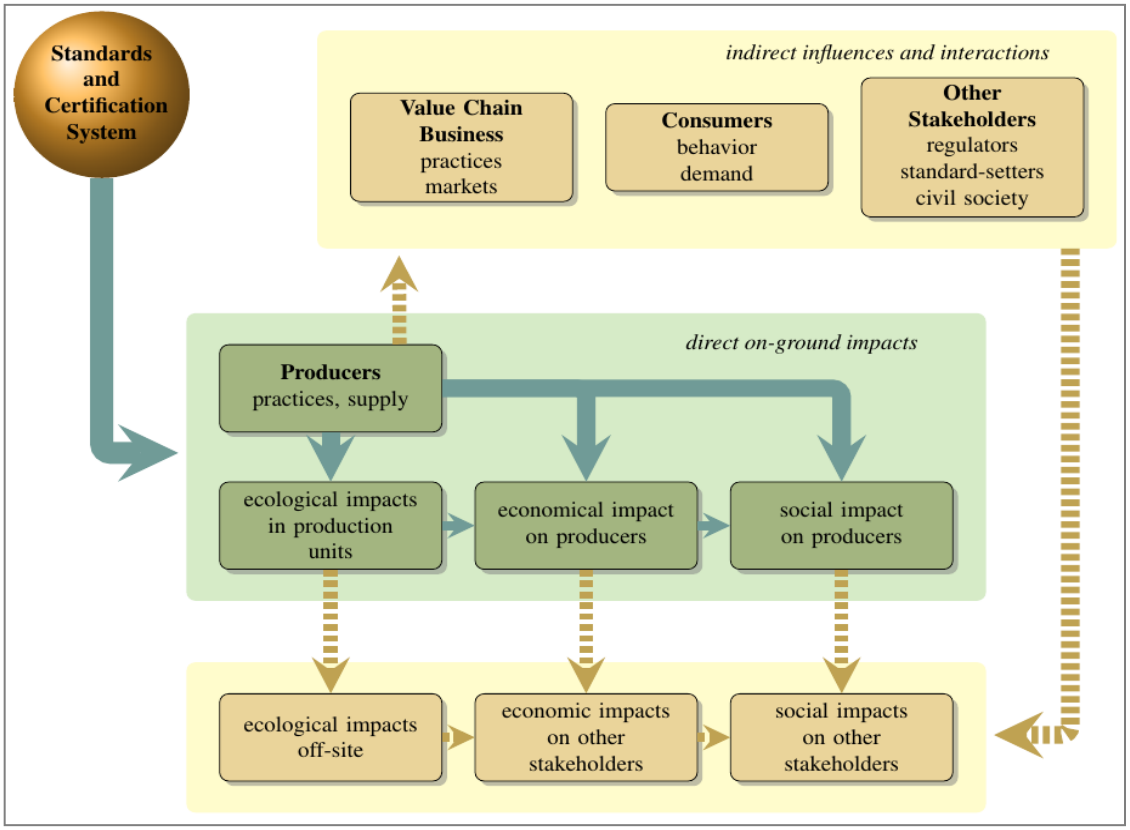
[51] *Although government interaction can also result in negative outcomes.*
[52] *http://worldwildlife.org/stories/in-vietnam-helping-catfish-farming-become-more-sustainable*
[53] *For more on the Lao experience in organic agriculture, see Appendix 4.*
[54] *Steering Committee of the State-of-Knowledge Assessment of Standards and Certification (2012)*

jurisdictions regulating building codes have started to enact mandates for meeting LEED standards.[55]

- *Symbiotic* – occurs when a certification system interacts with another entity to deal with a policy issue, while each maintains autonomy, such as when certification systems address a gap in existing policy. An example is the Clean Development Mechanism (CDM) Gold Standard which uses voluntary certification to fill gaps in an intergovernmental agreement (Kyoto Protocol). The World Wide Fund for Nature (WWF) initiated the CDM Gold Standard in 2002 to certify emission reduction projects under CDM which pass certain environmental and sustainability criteria.
- *Hybrid* – occurs when there is division and sharing of functions with another governance entity, which can be based on an explicit agreement between entities or not. An example is when a certification system is implemented to ensure compliance with government policies. The role of voluntary FSC certification systems in certifying that wood products are harvested in compliance with regulations in their country of origin is an actual illustration of this type of interaction.

The figure below illustrates the impacts of a standards and certification system, and the interactions between the system and stakeholders.

Figure 7: Impacts of and interaction between standards and certification systems and stakeholders



Source: Steering Committee of the State-of-Knowledge Assessment of Standards and Certification (2012)

[55] *LEED (Leadership in Energy and Environmental Design) green building certification system is a feature-oriented certification program that awards building points for satisfying specified green building criteria. The program was developed by the US Green Building Council in 1998. Many federal, state, and local governments have adopted various types of LEED initiatives, and provide incentives (such as tax exemption) for buildings that are LEED-certified (National Research Council 2010).*

2.6. LESSONS TO DATE

2.6.1. Factors affecting implementation of standards

- A 2009 report to the World Bank identifies the following factors which facilitate the implementation of standards[56]:
  - **type of product** – products with strict requirements of traceability, quality and safety (e.g. food), and where information on origin is important
  - **market conditions** – high level of market concentration among actors purchasing supplies, such as retailers, manufacturers
  - **kind of relations among actors** – long-term relations and high degree of trust
  - **identification** – commodities **identifiable** in end products (e.g. coffee, cocoa)
  - **length of the chain** – short chains with few actors
  - **degree of integration** – highly integrated chains.

- If the market is unwilling to pay a premium for compliance to a particular standard, or demand is limited, then the extra costs for complying to such a standard will deter adoption as it may be economically inefficient to do so. Government actors however can stimulate demand through **public procurement policies** by, for example, adopting procurement of only certified products for government use or by insisting on adoption to a certain standard for companies that bid for government contracts.

- Among consumer brands, **reputational risk management and avoiding bad publicity** are associated with uptake of standards.

- **Selection bias:** A common concern in standards implementation is its relative bias toward regions and farmers that are comparatively in a better starting point due to more favourable general economic and human development conditions. This is well-illustrated in the marine fishery and forestry sectors where developed countries are the significantly major participants in global certification schemes, often because it allows them to compete against low labour cost countries with low environmental standards. Among farmers, marginality (resulting from low education, harsh environment, remoteness of area) is a barrier to adoption. Standards also seem to favour larger operations, though this varies from industry to industry. Increasing bureaucratic requirements of international certification systems, moreover, privilege larger entities.

- **Regulatory framework design and enforcement:** Having property rights, clear rules of engagement, and enforcement of regulations can contribute to the successful implementation standards in various contexts. In forestry and fishery, development and enforcement of regulation affect the costs and risks of certification. For example, when timber extraction is very cheap due to weak enforcement of forestry laws, the opportunity costs of changing to sustainable practice can be high. Predictable and effective law enforcement encourages firms to seek out eco-sensitive markets which reward costs of certification through price premium or preferential purchase.

- **Institutional environment:** Governments play an important enabling and supporting role in the implementation of standards. The section on interaction pathways above outlines

[56] Tallontire and Greenhalgh (2005)

these roles. Managerial capacity, technical and financial support from donor organizations, as well as concerted institutional efforts of managers, NGOs, governments, certification and accreditation bodies, donor agencies, research institutions and business development service providers also determine of the success of implementing standards and certification systems.

2.6.2. Emerging trends and approaches

- *Meta-standards*. The proliferation of sustainability standards in the agriculture, forestry, and natural resource sectors has led to initiatives to develop meta-standards. See further details in section 2.4.5 above while **Appendix 1** lists and describes the features of some of these meta-standards.
- *Tiered approaches*. The LEED standard is an example of a tiered approach. There is a performance baseline against which improvements are measured according to three ascending levels of compliance (silver, gold, and platinum). Projects are scored in several categories, and the overall points received determine the level of compliance. This stepwise approach seems to work well in bringing as many players into the program as possible, but also allows for, and rewarding, improvement at the top. It could be the most effective way to raise the bar and the floor for performance in the sector.

In terms of research trends on sustainability, the following have been identified in literature: measuring impacts, establishing credibility, and mainstreaming standards.

3. CERTIFICATION

3.1. WHAT IS CERTIFICATION?

Certification is the process of verifying that a product, process, or service complies with a given set of standards or criteria. The certification system links the producer and consumer, involves interactions among stakeholders in the value chain, and involves processes that are not easily communicated by the label. Certification could be on the methods and the processes used along the production chain, or on the disposal of the final good (e.g. hemp rope vs. plastic cord).[57]

3.2. THE ROLE OF CERTIFICATION

The role of certification is therefore to assure the market that a standard is being met by the producer or supplier. This assurance also helps create confidence among consumers in the legitimacy of the label. The certification system can be broken down into three inter-related components: verification, certification, and accreditation. **Verification** is assessing compliance with a standard, and is carried out by auditors. **Certification** is when a decision on compliance is made based on the auditor's report, and a written assurance is issued. **Accreditation** is evaluating the competence of the certification body to determine compliance with the standard.

3.3. TYPES OF CERTIFICATION

The assessments of compliance to a standard (verification) can be any of the following: **self-assessment** or self-certification, **second-party assessment** by an interested party (e.g. a buyer), or **third-party assessment** conducted by an independent body. The issue of credibility is very important, hence the most credible schemes are those verified by independent bodies. A combination of these types is also possible, as in the case of **group certification**. Under group certification, second-party internal audit and a peer review process among group members is combined with a third-party assessment of their management process. This model is usually seen in the agriculture sector, and is a way to link smallholders with export markets. Producer group members share the cost of third-party certification thus reducing certification costs to individual farmers.

Group certification. Group certification systems were developed as a response to the need for a certification system that reduced costs for small and low-income farmers especially for those in developing countries. It was also a way to address the varied socio-economic-cultural conditions that farmers face in different countries. Group certification has evolved toward a system of combined internal and external controls applicable to all types of groups. Some national organic standards do not address the subject of group certification, although the major national markets (US, EU, and Japan) have issued guidance documents or statements on it. The scope of these documents addresses group certification of operations with similar production systems and centralized marketing, organized as a single legal business entity. The principle upon which the group is based is a managed and documented internal quality assurance system which is verified by the certification body at least once a year through audits and on-site inspections. The group is responsible for the compliance of its members and for the effectiveness of its quality system. The certification body has the responsibility of sanctioning the group it they were found to be non-

[57] *Matus (2009)*

compliant to requirements.[58] **Appendix 2** presents some examples of group certification, mainly found in the organic sector.

Regulations and voluntary standards differ in terms of clarity of goals and metrics and monitoring processes. Most regulations are based on legislation that state broad goals, while metrics and monitoring processes are left for the implementing agencies to decide on. In the case of certification systems (of voluntary standards), metrics and monitoring processes are usually already spelled out in detail in the criteria.

Considerations in defining the scope also differ between these two systems. Regulations attempt more often to regulate the behaviour of big players as their impact is more significant (e.g. pollution control). Considering government budgets, the burden of identifying, monitoring, and enforcing regulations on small producers may be disproportionate to the benefits.

Funding and institutional support for the long term is a greater challenge for voluntary certification programs than for government regulations. Regulatory programs have to compete for authority and resources in a political process, and environmental regulation and enforcement often are not priorities. The institutional structure and processes, however, are in place to support and fund them.

In terms of certification schemes for sustainably produced goods, for a producer or user of a good to be able to declare compliance of the end product with sustainability requirements, certification of the sustainability of the primary product is needed. This requires a traceability system (called chain of custody – CoC) to be established for the entire chain – i.e., from production to processing, and to trade.

CoC is the chronological documentation of showing the seizure, custody, transfer, analysis and disposition of evidence, physical or electronic, of a product. There are three CoC types: segregation (involves actual physical segregation); mass balance (certificate and product are sold together, and no issuing body is needed); and book-and-claim (through certificates of compliance issued to producers that can be sold to users and surrendered to an issuing body during declaration).

Audits are performed on the sustainability criteria and on the CoC.[59]

3.4. USES OF CERTIFICATION SYSTEMS FOR SUSTAINABILITY

The number of voluntary standards and certification systems has grown sharply in the last few years. This is seen in the increase in the International Social and Environmental Accreditation and Labelling (ISEAL) membership from eight systems in 2005 to more than 30 in 2011. In the wood and paper industry, in 2011 there were about 50 approaches to sustainable procurement of forest products, including forestry and procurement standards, certification schemes, labelling, and green procurement programs.[60]

[58] *DiMatteo (2008)*
[59] *FAO (2013)*
[60] *http://www.naturallywood.com/sites/default/files/Third-Party-Certification.pdf; www.wbcsd.org/pages/edocument/edocumentdetails.aspx?id=183&nosearchcontextkey=true;*

Sustainability standards and certification systems have developed for specific sectors (e.g. agriculture) or a specific purpose (e.g. fair-trade). Agriculture certification schemes were developed to ensure health and safety of certain products or to develop environmentally sound farming practices (e.g. Global Good Agriculture Practices – GlobalGAP, IFOAM). Forestry certification schemes aimed at ensuring sustainable forest management. Within the bioenergy sector, certification schemes or frameworks can be for biofuel feedstocks (e.g. Better Sugar Initiatives – BSI, Roundtable for Responsible Soy Production – RTRS), biofuels (e.g. EU–RED), or bioenergy production (e.g. Global Bioenergy Partnership – GBEP). For more detail on these certification systems, see Table 1 in section 2.4.5 above, and **Appendices 1, 2 and 3**. **Appendix 4** presents a few examples of standards and certification for sustainable agriculture systems in the GMS region.

3.5. LESSONS TO DATE

3.5.1. Limitations of certification

Certification programs are criticized for **lack of attention in measuring the impacts**, connecting the on-the-ground effects with market share, and attempting to measure how they have driven social and environmental improvements.[61] Evidence is still limited regarding impacts on poverty alleviation or food security, as the metrics for social impacts are poorly defined or lacking in sustainability schemes.[62] Certification programs do not generally require baseline assessments against which future improvements could be compared. They rely heavily on prescriptive guidelines to modify certain practices into more sustainable ones. Certification programs often include performance indicators; however, they focus on the management aspects, or process changes, and not the social or environmental outcomes. Fairtrade is the exception, as it sets economic benefits for producers as a main objective. The lack of available and meaningful data for comparison among certification schemes contributes to the difficulty of measuring impacts. There is also a dearth of peer-reviewed analysis of individual certification programs and the field as a whole. For further details see Chapter 5 below.

Lack of long-term or exit strategies in most certification programs. Many programs are dependent on the donor community, and it has yet to be seen if any existing sustainability system is ready to stand on its own, supported by the market. This is especially true in developing countries where certification development has been donor-driven. This raises the question of sustainability of the initiative, after the donor has left. Relatedly, the role of government interaction with the private sector is not well-defined, and their role in helping to scale up impacts is not usually considered in the programs.

Lack of provision for capacity building for producers to enable compliance. The majority of producers in any sector have resisted participating in voluntary sustainability standards. Fundamental requirements for data collection and reporting, on top of the large up-front costs discourage small producers. This has led to the situation where standards systems have evolved over time, but the infrastructure and capacity required to comply with them have lagged behind.

To the extent that standards are used to control imports, they can hinder trade and market access, especially for developing countries which have comparative advantage in a certain product and are interested to export. They are perceived, from the export standpoint, as a barrier

[61] *Elbehri et al. (2013)*
[62] *Elbehri et al. (2013)*

to developed country markets. Existing standards have received criticism for reinforcing global inequalities, in terms of who defines and who enforces the standards.[63] Standards have also been criticized as reflecting only capacities of developed countries and the position of disadvantage that this poses for developing countries.

Consumer demand for certified sustainable products is not as widely pervasive as generally thought. Certification schemes cover less than 10 percent of the market. The case of certified ethically produced goods shows that consumers' willingness to buy is not usually translated into actual purchase. For certified forest products, the major demand comes from governments or institutional buyers.

The governance structure in some of the major certification schemes are led by large-scale agro-industry. This raises the concern that standards are being set without the substantial contribution from diverse stakeholders who may lack the capacity to be represented and be involved in the intensive standard development process. Such a structure would also favour big players as it provides incentives to scale up production to make up for the certification costs.[64] Some critics therefore point out that such systems have compromised too much toward business interests or their own need to gain market share and thus, set standards that are too low to achieve meaningful change. This criticism highlights the concern that voluntary standards have limits in terms of both the extent of change they can bring about and the share of a market they can affect.

Certification programs do not always transfer successfully in all climatic zones or ecosystems. Certification programs are considered "global" but have to be adopted locally, which may be problematic as meta-standards or international standards do not always adequately reflect local conditions or needs.[65] There are attempts, however, of some standard systems, to address specificities in conditions or geographical contexts. This is most notable in organic agriculture, where regional organic standards are being developed to advance common market requirements based on regional conditions.[66]

Proliferation of certification schemes could lead to confusion or reduce confidence among consumers. Harmonization of standards is seen as a way to address the proliferation of sustainability standards and the problems they raise for both exporters and importers. (See **Appendix 5** for additional details on harmonization and regulatory convergence.)

High direct and indirect costs. Direct costs refer to audit and certification assessment costs, which cover costs by an audit team in visiting operations, annual certification fees, membership or use of logo, among others. Certification costs depend on several factors, e.g. size and location of the farm. Auditing costs depend on the number of criteria included in the standard and the expertise required for verification. Indirect costs refer to upgrades in management and investments needed to meet the standard, and are far more difficult to quantify. Van Dam et al. (2010) have estimated indirect costs to be typically 5–50 times higher than direct costs.[67] The cost of compliance with a certification program is a significant barrier to the widespread adoption of standards. In addition, producers often have to comply with multiple schemes. This increases their

[63] *Vollmer (2010) citing OECD; UNEP; Vandergeest*
[64] *Elbehri et al.(2013) citing UNCTAD*
[65] *NAS (2010)*
[66] *The Asian Regional Organic Standards (AROS) was approved for Asia in 2012, following earlier regional standards in Europe, East Africa, and the Pacific.For more on regional organic standards, see Appendix5.*
[67] *Van Dam et al. (2010)*

transaction costs which include costs associated with data gathering, documentation, and reporting. Some ways to address this may be to subsidize smallholders, or passing on the cost to retailers through charges for the use of a logo.

It is widely recognized that, especially for small producers from developing countries, the costs constitute a huge barrier. Capacity building assistance by some certification systems and organizations help in reducing potential costs of more disadvantaged producers. Some introduce stepwise improvements that lead to stricter criteria thus allowing large costs to be spread over time. Certification is beyond the reach of marginal and most small-scale farmers because of the costs and requirements involved. Group certification may address this. The promotion of local certification bodies may also reduce costs for small producers. Local certification bodies provide the advantage of having local inspectors who may be more informed about on-site conditions, and are better able to conduct spontaneous inspections.[68]

Because of these limitations, proposed certification schemes need to be thoroughly assessed in terms of what objectives are being sought from certification, the extent to which certification can help meet these objectives, and other policy tools that are required to help meet the objectives (see Figure 2). Certification can be effective in bringing about rapid changes in production practices when market-leading firms use it to verify and enforce for better practice and performance by their suppliers through contractual requirements e.g. multinational supermarkets requiring certification from the Kenyan fresh vegetable suppliers. In this case there is scale and resources to maintain the schemes. It is useful as a complement to regulatory policies, to fill gaps and to introduce mechanisms for adapting to rapid technological change. Filling the regulatory gap can happen in such cases as forestry conservation, where government may not be willing or not able to regulate. Adaption to technological change is most obvious in green technologies, e.g. Energy Star-certified LED lamps.

Other policy tools and strategies, including regulatory mandates and incentives, are better situated to influence the parts of the market in which certification is less attractive, less well understood, or unimportant to consumers and producers. In circumstances in which certification is insufficient to achieve sustainability objectives, it may still fill important complementary or supporting roles.[69]

[68] *Elhbehri et al, (2013) citing Rundgren*
[69] *Steering Committee of the State-of-Knowledge Assessment of Standards and Certification (2012)*

4. LABELLING

4.1. WHAT IS A LABEL?

A label is a mark or symbol that indicates compliance with certain standards, and often, is the last element of a certification system. This is the most visible part of the entire process (See Figure 6).

4.2. THE ROLE OF LABELLING

Labelling is a tool to communicate desirable attributes in a product (often unobservable), process, or service in order to influence consumer purchasing behaviour. Labels need to be legitimate, allowing consumers to access information about the underlying certification and standards.

4.3. TYPES AND USES OF LABELS

Depending on the target audience, there are several kinds of labelling strategies: labels on consumer goods (e.g. certified organic), labelling within the supply chain (e.g. firms requiring ISO 14000 certified suppliers, supermarkets requiring certified fish), and use of scorecards within the supply chain (e.g. Material Data Safety sheets for chemicals). The details of a standard influence the most effective method of labelling. A recent trend has been for the use of multi-attribute labels which provide the opportunity to create standard systems that incorporate or bundle values, rather than just individual features. The bundling of values in a single label allows a product to communicate its social (e.g. fair wages for workers), health (e.g. non-toxic), and environmental benefits (e.g. sustainably harvested).

There are many labels and declarations of environmental performance. This large and composite family should be referred to as “environmental labels.” Ecolabels are a subset of all environmental labels, and respond to criteria of comprehensiveness, independence, and reliability.[70] They provide consumers information on the impacts of their consumption that they otherwise would not be aware of. Ecolabels identify overall environmental performance of a product or service based on a life cycle consideration. They allow consumers to make environmentally friendly choices among a range of products or services. They provide marketing opportunities to products that stand out from the others, and support innovation which can lead to diffusion of green products in the market.

In July 2013, the Ecolabel Index tracked 435 ecolabels in 197 countries and 27 industry sectors.[71] The highest incidence of ecolabels is found in food products, appliances, housecleaning products, and paper products. Ecolabels trace their origins to Germany’s Blue Angel label introduced in 1978, and became the first worldwide environmental label. The figure below shows the types of ecolabels according to the International Organization for Standardization (ISO).

[70] *UNOPS (2009)*
[71] *http://www.ecolabelindex.com/*

Figure 8: Types of ecolabels (Source: International Organization for Standardization (ISO))

Germany's Blue Angel Label

The first ecolabelling program was introduced by Germany in 1977. The German Federal Environment Agency launched the Blue Angel to promote environmental and health awareness. The Agency set requirements and established test methods for products that were relatively eco-friendly and less health-endangering than other conventional products. Industry participation is voluntary. Product groups are regularly assessed to reflect technological and design developments and only those products that exceed the average are awarded the label. More than 4,000 products in 71 categories are covered by the German ecolabel. Since 1991, manufacturers of Blue Angel products must reclaim the product at the end of its useful life. Blue Angel criteria include: efficient use of fossil fuels; alternative product with less of an impact on the climate; reduction of greenhouse gas emissions; and conservation of resources. To reflect technological progress the Federal Environment Agency reviews and, if necessary, revises the criteria every three or four years. At the end of the term the Federal Environment Agency re-submits the criteria for awarding of the Blue Angel to the Environmental Label Jury for decision.[72]

The following German institutions are in charge of the Blue Angel label:

- *The Environmental Label Jury*: an independent decision-making body composed of representatives from environmental and consumer associations, trade unions, industry, trade, crafts, local authorities, science, media, churches and federal states.
- *The Federal Ministry for the Environment Nature Conservation and Nuclear Safety*, the owner of the label. It regularly informs the public about the decisions of the Environmental Label Jury.
- *The Federal Environment Agency* with its ecodesign, ecolabelling and environmentally friendly procurement department which acts as the office of the Environmental Label Jury and develops the technical criteria of the Basic Award Criteria for the Blue Angel.
- RAL gGmbH, which is the label-awarding agency.

The Blue Angel logo consists of the following three elements:

- The environmental **symbol** of the United Nations.
- The surrounding text specifying the main **environmental properties** of the product carrying the label, e.g. because energy-saving or low-noise.

[72] *http://www.blauer-engel.de/en/blauer_engel/balance/success_stories.php*

- Indication of the product's **central protection goal**, e.g. "it saves resources". The product groups are currently classified into four different protection goals.

A study that analyzed ways to further increase the degree of acceptance of the Blue Angel found that three-quarters of consumers in Germany take into account the Blue Angel label when they go shopping. Major problems identified are the large variety of environmental and energy labels used in Germany, the rather complicated procedure to obtain the label, and the relatively high costs for its use. The ecological effectiveness of the label and the usefulness for overall environmental policy depends significantly on the nature the product category. Some products were more successful than others to meet their environmental objectives. Despite these, the Blue Angel successfully promoted innovation in a number of product categories (e. g. in low-emission oil and gas burners, where the label was accompanied by other measures such as training courses organized by craft organizations). The Blue Angel is an important environmental label in Germany. The isolated impact of the label is difficult to access and probably relatively low in terms of energy savings and CO_2 reduction; however, any positive impact of the Blue Angel is heightened when it is accompanied by other policy tools and measures.[73]

Source: http://www.blauer-engel.de/en/blauer_engel/whats_behind_it/index.php

4.4. LESSONS TO DATE

- The experience with ecolabels suggests that good design is important, and paying attention to the context in which they are used is crucial.

- It has been suggested that the promotion of "responsible buying" has had limited success because consumers' purchasing decisions are largely determined by issues of convenience, flexibility, and function. Purchasing routines tend to be habitual and consumers do not expend too much cognitive reasoning in doing so. This implies that ecolabels appeal mostly to consumers who already have a prior interest in environmental issues, also called "commodified activism."[74]

- A certified label is shorthand for consumers, as well as for buyers and sellers in business-to-business transactions. Social marketing is a field that needs to be further investigated, to understand better how to promote behavioural change, and how to build consumer preference for sustainable products.

[73] *http://www.muredatabase.org/public/mure_pdf/household/GER14.PDF*
[74] *Vollmer (2010)*

5. PERFORMANCE AND IMPACT OF SUSTAINABLE STANDARDS AND CERTIFICATION SYSTEMS FROM CASE STUDIES

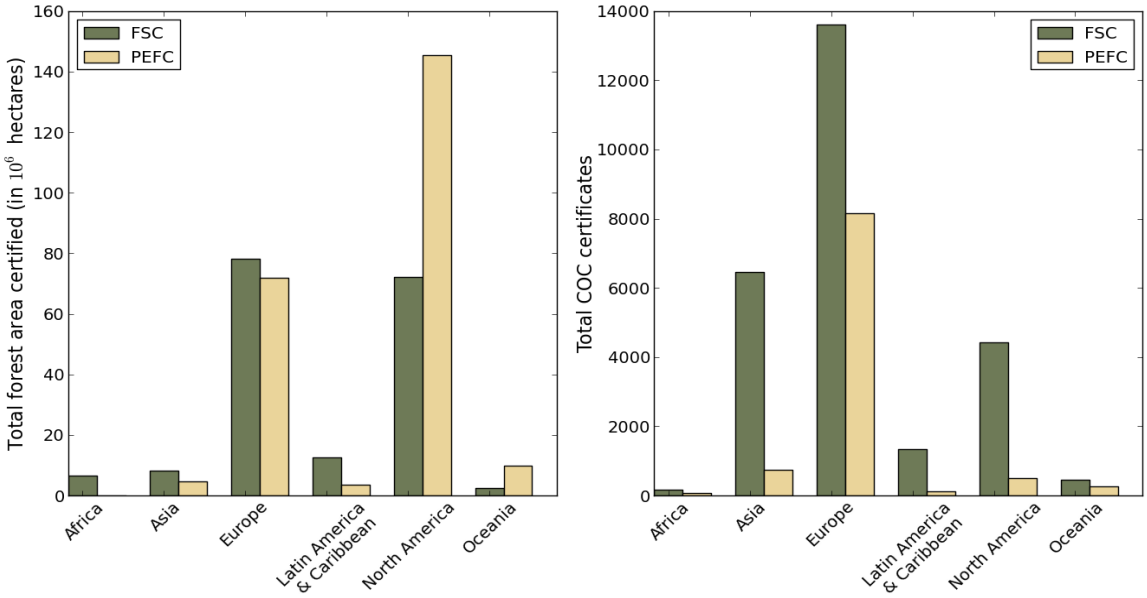
During the early years of the standards movement in the 1990s, certification bodies were more focused on increasing the uptake of standards throughout the value chain. As the schemes have grown in scope and scale, the demand is now on finding evidence of the benefits the schemes were purported to achieve in the community and in the environment. There is growing literature studying the performance and impacts of these systems, but the focus has mainly been on understanding impacts at the farm scale, or across groups of farms or entities. For environmental impacts in particular, the impact depends on the interaction between the farm or the unit under study and the surrounding landscape. This makes the measurement of impacts more difficult. Evidence, thus, is limited for the environmental aspects, as most available are anecdotal and cannot be a basis for generalization. The evidence and insights below are based on certification experience in the forestry and agricultural sectors, which were the earliest to develop sustainability schemes. Evidence from the fishery experience is also mentioned briefly. Labelling experience and impacts of certification on trade are discussed toward the end of this chapter.

5.1. EVIDENCE AND INSIGHTS FROM EXPERIENCE: THE FORESTRY SECTOR

Data declared by FSC and PEFC[75] show that global total area of forests certified under the two systems stands at 423 million hectares, as of July 2013.[76] The growth is mostly accounted for by the increase in certified temperate and boreal forests. In terms of chain of custody (CoC) certification, EU countries lead in PEFC certification, with 8,079[77] CoCs, and for FSC, 12,500[78] for EU countries. The majority of industrial forest companies and private forest owners in the US and in Europe are now certified. The figures show that there is strong support for certification in the Northern countries, in contrast to the lower uptake in the tropics. Since these systems were established, significant increases have been achieved which reflect growing support for certification. The low numbers however, especially on chain of custody, could be interpreted as indicating the limits of certification as a mechanism for changing forest management practices in the tropics.

[75] For more on FSC and PEFC, see **Appendix 3**.
[76] Total forest area globally was estimated by the Forestry Resources Council (FRC) in 2010 to be four (4) billion hectares FAO (2010)
[77] *http://pefcregs.info/statistics.asp*
[78] *https://ic.fsc.org/facts-figures.19.htm*

Figure 9: Certified forests and CoC certificates, as of July 2013



Source: Computed from data from http://pefcregs.info/statistics.asp, https://ic.fsc.org/facts-figures.19.htm

5.1.1. Impacts on the ground

A review of relevant literature by Cashore (2011) shows that certification has had some important impacts on forest management. Among the cases studied, examples include the decline in the deforestation rate of FSC-certified concessions in the Mayan Biosphere Reserve compared to the region as a whole. This was “most likely due to the sustainable practices required by FSC.” The impact on protection of wildlife habitat was also shown to be positive as in the case of Sabah’s lowland, dipterocarp forest, home of endangered large animals such as orangutans and elephants. The focus in this case was on reduction in logging and identification of high-conservation value areas.

Caution, however, is advised on making conclusions from the literature about impacts. A reason would be that there are various methodological issues in the framing of some of these studies. One important issue is the lack of systematic attention in studying more than one impact. Most studies focus on single cases and different types of impacts, which make it difficult to reach conclusions beyond a particular case.

An issue also arises when concluding from larger quantitative studies, which determine the correlation between certification and outcomes. This approach does not adequately measure whether there is a relationship between certification and the outcomes, and if there is, which one is the cause and which the effect. Put another way, if sustainable practices correlate with companies that were already adopting practices at this level, then certification would be considered a result and not the cause of responsible behaviour. An example of this is the case of the impacts of FSC and PEFC certification on forests in Sweden (Johansson and Lidistav as cited in Cashore 2011). Industrial owners chose FSC while small forest owners chose PFEC. Results showed that enhanced biodiversity was not so common in the large industrial forests compared with the small forests. Subsequent research showed that more harvesting occurred in the certified small forest properties. This put into question the overall impact of certification on biodiversity. In these studies, however, no test was done to determine whether the change in behaviours was a result of

certification, or whether the behaviours were already being adopted prior to certification. In the latter case, the company's choice of a certification system could simply be because its standards are consistent with the company's existing practices, which means improvements may no longer be needed.

An analysis (Cashore et al. as cited in Cashore 2011) of the effects of forest certification in 16 countries showed that while the uptake was still limited, certification seemed to have helped in empowering marginalized groups.[79] Multi-stakeholder participation in forestry governance was introduced, and the focus expanded from production and yields to now include worker participation rights.

Cashore makes the following observations from reviews of relevant literature:

- evidence exists on the positive effects in improving environmental and social conditions in specific cases such as habitat for apes, and well-being of workers;
- research on impacts on-the-ground is very limited. Many are desk studies or reviews of standards;
- many conclusions from existing studies are not derived through rigorous methodologies and careful analysis.

5.1.2. Insights from experience

- *On costs*: Direct costs vary across countries, certification system, and ownership size. Also, data on indirect costs of auditing such as costs of changing or creating management procedures, staff training and opportunity costs of staff time are difficult to estimate. Research on costs from improvements in operations show variations depending on the degree of changes required to become certified.
- *On consumer demand*: Research on consumer awareness shows that levels of awareness vary significantly across countries. An FSC study showed that in the Netherlands, awareness of the FSC label rose from 12 percent in 2001 to 63 percent in 2004. To compare, a 2008 survey showed that only 12 percent of US respondents were familiar with the FSC label, while in Canada, the figure was 17 percent.
- *On factors that enable or hinder certification:* "Structural" features are important for certification such as:
  a) The country's position in international trade – firms are more open to the idea of certification if their forest products sector had to compete with foreign suppliers.
  a) Transaction costs – large forest companies have fewer constraints.
  b) Domestic policymaking processes – support for FSC was more likely when forest regulations were already in place and business interests did not dominate policymaking.
- *Forest certification impacts other processes*. These processes include governmental policymaking, commitments at the firm level, and public-private partnerships. These interactions can happen in the following instances:
  a) Certification acts as a learning process enabling government to develop more broad-based policies.
  b) The government uses certification as a requirement for obtaining licenses.

[79] This is an issue of property rights and communal rights versus politically allotted rights.

- *Developing countries face more challenges in certification*. These are on forest governance, lack of capacity and resources to implement certification, and corruption which erode trust and accountability.

Forest certification has created impacts by promoting sustainable forestry management in some countries where there is strong support for certification. There is, however, a need to improve methodologies for data collection and analysis to better understand the impacts on specific parameters and across cases, and to determine when findings may be generalized. There is evidence that there are changes in forestry practices because of requirements by certification, but it is unclear whether it has resulted in declines in forest degradation and deforestation.

5.2. EVIDENCE AND INSIGHTS FROM EXPERIENCE: THE AGRICULTURE SECTOR

5.2.1. Impacts on the ground

Direct or on-the-ground impacts of certification systems on agriculture can be divided into environmental, social, and economic impacts.

i) On environmental impacts

Despite the strong interest in environmental and ecological issues associated with sustainable agriculture standards, studies that measured ecological indicators have been relatively few. The few that have, though, were rarely designed appropriately to measure the impacts of certification.

A 2010 study of Costa Rican coffee farms found that certified organic farms reduced their use of herbicide and pesticide. It also found that they increased adoption of environmentally sound practices such as soil conservation, and the use of shade trees and organic fertilizer. A 2003 study in Ecuador on bananas found that farms certified to Rainforest Alliance and Fairtrade adopted more sustainable practices in relation to land, water, agrochemical and waste management compared with non-certified farms. These studies, however, focused on management practices and not on actual environmental indicators, e.g. biodiversity conservation.[80]

A study of eight European countries in 2010 found that replacement of conventional farming with organic practices was associated with increased diversity in beetle species, but not in breeding birds as might be expected. Other studies found similar results in that there is evidence of better biodiversity overall in organic farms, but these varied across taxonomic groups. Lebel (2012) cautions, however, that these should not be regarded as evidence of impacts of certification systems. Oelofse (2010) compared nutrient budgets between organic and conventional farms in China that grew soy and vegetables, and in Brazil that grew citrus. He found that certification does not lead to significant changes in the soil nutrient stocks. This was because soil fertility management in the two farm types was similar.

Life cycle assessments of organic cultivation have conflicting results. Some suggest that because of the lower yields, some off-site negative impacts might be higher compared with conventional production. Total energy use, however, appears to be less in organic farms per hectare and per unit product.[81]

[80] *Lebel (2012)*
[81] *Lebel (2012)*

ii) On economic impacts

Except for Fairtrade programs, many sustainability standards have few or no economic criteria. Fairtrade schemes require minimum prices and social premium, productivity improvements, and other criteria that influence competitiveness.

A review by Nelson and Pound (2009) of 80 studies on Fairtrade coffee, cocoa and banana producers show strong evidence that certification provides a favourable economic opportunity for smallholder families who belong to producer organizations, and supply products of the right specifications demanded by the market.[82] Impacts on plantation workers, though, is less known. Among certified coffee smallholders, the most direct benefit identified was stable incomes because of guaranteed markets.[83] A higher proportion of studies reviewed found higher returns to farmers from sales to Fairtrade markets than with sales to conventional ones. Several studies, however, show incomes to be low and modest. In cases in Bolivia and Southern Mexico, while the Fairtrade price was considered a "lifeline" during price fluctuations and crop damage, the incomes do not reach a "living wage" (Jaffee 2007; Stonehill 2006). In Ghana, Fairtrade cocoa farmers continued to have difficulty meeting their basic needs, and have to depend on other crops and other non-agricultural sources. This is also supported by findings of a 2000 study (OPM/IIED)[84] which showed that there are instances when premiums were too small to accrue to the farmers, but was used at the organizational level. Those who experienced increase in incomes, such as in Mexico and Central America, enabled producers to diversify and spread risks (Murray et al. 2003). An example of this is when income is derived also from alternative activities for which the cooperative provided trainings (such as handicraft making and marketing). The benefits to producer organizations include having the resource to capitalize the group and improve the financial management. Overall, the review found that context played a significant role in terms of impacts, and positive changes in the certified individual or organizational well-being are hard to attribute to a single factor (such as certification).

Studies of fair-trade bananas compared certified households and non-Fairtrade certified ones in Peru, Costa Rica, and Ghana. Outcomes diverged in the three cases. In Peru, Fairtrade farmers had higher net incomes than organic certified farmers. The higher incomes, however, were attributed to higher productivity, not higher prices. However, compared with farms that had no certification, Fairtrade farmers had higher incomes, which could be attributed to higher prices. The Costa Rican case found no difference in incomes between certified and non-certified farmers. In Ghana, households belonging to certified cooperatives had lower incomes, but also worked fewer hours.[85]

Significant economic benefits were observed in four out of seven studies in the certified coffee sector. A study of fair-trade cooperatives in Nicaragua, Peru and Guatemala found evidence that certification generated a price premium. Similarly, a study on organic certification in Uganda found a 75 percent increase in coffee revenues, and a 12 percent increase in average incomes of certified households. The third study, conducted in El Salvador, showed yield increases of up to 76 percent in 183 certified organic farms, compared with 22 percent in 60 conventional farms. These trends were similarly observed in exporter data. Another study of certified farms in Nicaragua and Guatemala in 2008–2009 showed that they outperformed conventional farms in four out of five

[82] *For more details on Fair Trade certification, see* ***Appendix 3****.*
[83] Twenty-nine out of the 80 papers reviewed demonstrated this as a benefit (ranked first in terms of number of papers which demonstrated this).
[84] *Oxford Policy Management/ International Institute for Environment and Development*
[85] *Lebel (2012)*

standards, and generated profits twice that of conventional farms[86]. The three remaining studies did not find clear evidence of economic benefits. A Costa Rican study found that price premiums compensated for the lower yields of organic farms, but these were not sufficient to cover the additional costs to certify. A study in Peru showed no differences in terms of income or investment between organic or fair-trade certified farmers and non-certified ones.[87]

Some studies showed ambiguous evidence about economic benefits. Thirty-three studies were reviewed which revealed some positive economic benefit in almost all cases through higher prices and income stability. Stable and secure access to markets is claimed by certified producers to be the most important benefit. Guaranteed prices cushioned Fairtrade certified tea farmers in South Africa during the sharp declines of tea prices in 2006–2007. Certified Nicaraguan farmers also claimed that minimum prices reduced their vulnerability to fluctuations in the world market. A review of selected sustainable coffee certification programs (Utz Kapeh, Organic, Fairtrade, and Rainforest Alliance) showed that the overall income impact depends on the balance between extra costs to meet these standards; and the extra income earned from the premium net of impact of changing practices on yield and quality.[88]

The tradeoffs of certification are illustrated in the results of several studies. One of these compared the impacts of Fairtrade, Rainforest Alliance, and C.A.F.E Practices (Starbucks) certifications on Nicaraguan coffee producers. It showed that farmers benefited from higher prices through Fairtrade, but those certified to the other two systems produced higher yields and overall better performance. Overall, available literature reveal varying effects of certification on yield and quality, and methodologies applied so far do not isolate the impacts and the factors they can be attributed to.

In terms of revenue gains, a study of the fair-trade coffee value chain between Nicaragua and Finland showed that farmers received 7 percent more, while consumers paid 55 percent more. The retailer end of the chain realized most of the revenue gains. A 2009 study by Valkila (2009), moreover, showed that while incomes of certified farmers were higher compared with the non-certified farmers, the lower yield means the gains are not enough for marginalized farmers to escape poverty. The same author concluded in a subsequent study that certified farmers received a smaller fraction of the retail price of fair-trade coffee than non-certified farmers do from conventional coffee. He notes, however, that retailing and distributing costs might be higher because of lower volumes and marketing.

Business opportunities may be enhanced through participation in certification schemes. A study of certified Fairtrade coffee farmers in Peru in 2011 showed that they considered prices, technical assistance, marketing management, and leverage of the cooperatives to be satisfactory. Although capacity building activities are not inherent in the standards themselves, such activities seem to have improved the business management skills of farmers, as in the case of Fairtrade coffee farmers in Bolivia. Organic soy and vegetable farmers in China considered that by being certified they benefited from a stable market and technical support from the contractor.[89]

Studies which were designed to correct for biases show that more stable prices, price premiums, and access to trade channels are associated with certification. Other economic benefits identified

[86] *Unfortunately none of these studies mention the share of the market or production that the study sample represents.*
[87] *Cashore (2011)*
[88] *Giovanucci and Ponte (2009)*
[89] *ITC (2011)*

by other studies include credit access, technical assistance, as well as opportunities for income diversification. Most of the evidence of economic benefits and business-related impacts comes from the experience of Fairtrade certification. It must be noted, however, that within these studies, are also cases where desired economic outcomes are not achieved, especially when yields and other costs are considered.

iii) On social impacts

Social criteria of most certification systems are based on the ILO conventions on worker health, safety and work conditions. Some standards include criteria on gender, employee benefits, and engagement in the community. Studies on fair-trade systems provide most of the available evidence on the positive impacts of certification systems on social and working conditions.

A few of the studies had rigorous research design which captured the factors that certain benefits could be attributed to. One of these is a study of fair-trade cooperatives in Nicaragua, Peru, and Guatemala, which showed significant but uneven impacts of certification on health and education among certified families. This means that farmers' participation in certification programs increased the likelihood that the children attend school.[90] Another is a study of a certified banana cooperative and non-certified cooperatives in Ghana in 2008, which showed that there is no difference to the levels of work safety, satisfaction, or fairness indicated by farmers between the two groups. It must be noted however that the fair-trade workers had fewer hours of work, lower salaries, and lower family income.[91] A study of Kenyan farmers engaged in fair-trade certification for different products found that they were more satisfied with their living conditions and nutrition, comparing with the non-certified farmers.[92]

Other studies that employed less rigorous methods also came up with mixed evidence. Examples include a study of Mexican certified and non-certified farms which found no considerable differences for income-related variables such as education even though certified coffee generated a higher price. Case studies of workers in the horticultural sector of Kenya, South Africa, and Zambia in 2005 suggest that codes of conduct did not necessarily lead to improvement in the conditions of women or temporary workers. Studies of gender equity in fair-trade and organic coffee producers show significant positive benefits for women. With certification, the women organizations have better access to certified coffee networks, gain control over farm practices, and earn cash incomes.[93] It must be noted, however, that there is the risk that traditional gender roles might be reinforced by opportunities. They might also increase women's workloads without the corresponding benefits.

Some certification systems support community development through funding. Fair-trade schemes directly assign funds to local communities. An example is the amount set aside for cooperatives producing Rooibos tea in South Africa (USD0.66 per kilo) and estates using hired labour (USD1.57 per kilo) as social premium. These premiums are then used for improvements, schools, and other community initiatives.[94] Who has a say in how these premiums are to be spent is an important issue, whether they should be the growers or the local community. Evidence is mixed in this aspect. A study of Fairtrade tea in Kenya described that decisions were made by a Social Premium Committee. Tea farmers, however, would rather receive higher prices, and disapproved that the

[90] *ITC (2011) citing Arnould et al.*
[91] *ITC (2011) citing Ruben and van Schendel*
[92] *ITC (2011) citing Becchetti & Constantino*
[93] *ITC (2011) citing Lyon et al.*
[94] *ITC (2011) citing Blowfield and Dolan*

benefits went to other community members who did not grow tea. Households of certified banana farmers in Costa Rica were found to invest more in education and training, though incomes were not higher. This behaviour was due to collective decision making on how the social premiums were to be used.[95]

The amount of premium and amounts, however, differ depending on the characteristics of the product (e.g. price, quality, type of wood). Price premiums also are unstable. An example is in Brazil, where one study found that certified tropical hardwoods had a premium of 20–50 percent, but commodity products, such as composite boards, had no premiums.

A 2009 review of over 80 studies on impacts of Fairtrade certification at the local and community level support most of the findings mentioned above.[96] The authors note that most of the studies focus on outputs (e.g. higher price, training) than on outcomes (e.g. higher incomes) or livelihood impacts (e.g. improvements in material wealth). Other indicators that showed strong evidence are non-income benefits (e.g. capacity building, market information, access to credit). Most of the studies, however, emphasize that the income improvements do not seem to be great enough to bring these families out of poverty, as many of them are able to cover only basic needs even after certification.

5.2.2. Insights from experience

- Being certified reduces income vulnerability, but does not seem to be enough to raise livelihoods to a sustainable level. Certification needs to be supported or complemented by government policies and interventions that target development needs at the community level.
- Non-income benefits from being part of a certified producers group are widely acknowledged among smallholders. These benefits include access to credit, market information, trainings, and business management assistance. At the organizational level, strengthening of producer groups is commonly identified.
- Income benefits to individual members of certified groups do not entirely come from certification, but from other support activities provided by the organization (e.g. trainings for handicraft making and marketing). Standards do not guarantee that price premiums necessarily reach the farmers or the communities.
- Yield reductions, as the case in Ghana when shifting from no- or low-shade to medium-shade production required by Rainforest Alliance, need to be offset through price premiums or trainings in good practices.
- The issue of gender empowerment has not been well-researched. What little information is available shows mixed evidence. Participation and access to cash income have been mentioned by some narratives, but impact of certification on overall gender empowerment is still an open question.
- There is a lack of systematic studies that employ more rigorous methodologies to determine impacts of certification on the ground. The need for more research and evidence on the range of indicators of performance and effects of certification programs is widely recognized. Relatedly, reviews point to the need to understand in which particular conditions certification can make a difference on poverty and sustainability.

[95] *ITC (2011) citing Zuniga-Arias and Segura*
[96] *Nelson and Pound (2009)*

5.3. EVIDENCE AND INSIGHTS FROM EXPERIENCE: THE FISHERY SECTOR

According to a 2010 study, demand for certified seafood is growing, mainly driven by the private sector in developed countries. The market for sustainable seafood in the US and Europe is being driven by a handful of retailers, most of whom have made strong commitments to sustainable fishery as part of their corporate sustainability policy. This in turn, has significantly increased the perceived market value for certification. From this experience, it has been shown that certification increases market access for fisheries.[97]

In addition to growing demand, certification in the fishery sector has become a valuable tool for demonstrating the traceability and the legality of a product. Illegally landed product and fraudulently labelled product (e.g. farmed salmon labelled as wild salmon) are major issues facing global fisheries. Certification provides assurance through chain-of-custody, which is important for purchasers wishing to safeguard their seafood supplies from illegal product (e.g. McDonald's procuring only MSC-certified whitefish for its Filet-O-Fish products, though it does not use the MSC label).[98]

In terms of impacts on the environment, a 2009 study by Gulbrandsen examined the effectiveness of the Marine Stewardship Council (MSC), the leading wild-capture fisheries certification program. Assessments of the benefits to the environment of MSC certifications have generated mixed results. The study found process improvements in certified fisheries that could lead to enhanced marine biodiversity conservation. Only one major ecological improvement, however, was recorded that was associated with the MSC certification – a reduction in seabird by-catch in the South Georgia Patagonia toothfish fishery. The study mentions other findings which concluded that although MSC may provide incentive for industry to adopt better stock management, it had failed to demonstrate that certification prevented the decline of fish stocks. From experience, it seems that fisheries certification alone is not likely to arrest declining fish stocks. The intersection between private and public efforts is being suggested as an area to look into to address marine fishery issues.

5.4. LABELLING AND CONSUMER DEMAND: EVIDENCE FROM EXPERIENCE

The question of interest here is whether consumers who claim to prefer ethically produced products over non-certified ones actually buy them. The majority of surveys show that those who claim thus, also claim to be willing to pay a price premium for such products. There is, however, no clear evidence that consumers actually look for certified products when shopping and pay a premium price for such products.

A 2011 study of consumer behaviour on the purchase of Fairtrade-labelled coffee was conducted in a major US retail chain showed two key findings.[99] First is that the Fairtrade label had a positive effect on sales, which increased by 10 percent when two popular bulk coffees were labelled as Fairtrade. Second is that price-sensitive consumers were unwilling to pay a premium for the Fairtrade label. The most robust finding in existing literature on consumer purchasing behaviour is that women are more likely than men to report purchasing and participating in "politicized consumption." Some findings also show that consumers were prepared to pay more when they were given information on the positive impacts of the program (e.g. number of farmers participating

[97] *CEA (2011) quoting CEA*
[98] *CEA (2011)*
[99] *Heinmueller et al. (2011)*

and their revenues from Fairtrade sales). On the other hand, a study by the Natural Marketing Institute (NMI) on consumer attitudes reveals that they buy products with "sustainable" labels for health reasons.[100] This could imply that consumers care less about the environmental or social impacts of their purchases or about distant ecosystems or the global commons, but place higher value on the health benefits that consumption of such products claim to bring.

Other studies show that consumers are willing to pay varying amounts for the enhancement of food attributes (e.g. food safety, fair-trade, animal friendly), and more importantly, for the information that they believe provides assurance of quality i.e. consumers perception of quality may differ from producer expectations as to what the consumer is looking for. These differences in amount willing to be paid depend on the product, the attribute, and the country. The impact of consumer demand for food quality and safety has to be considered in terms of market segments and industry developments.[101]

In the last two decades, the literature shows that the individual consumer is not as significant as perceived. Institutional and business buyers have been the major drivers in the demand for certification. For forestry certification, government and public bodies have become important purchasers, as many have started to adopt green procurement policies.

5.5. IMPACTS OF STANDARDS ON TRADE AND SUPPLY CHAINS: EMPIRICAL EVIDENCE

The evidence of effects of standards on trade comes from econometric studies and – for the agriculture sector – mainly investigates product quality and safety standards for horticulture and food products. In the food safety literature, a leading study by Wilson and Otsuki (2004) examined the impact of pesticide regulations in 11 OECD importing countries on exports of 19 countries across Asia, Africa and Latin America from 1997 to 1999. The results suggested that a 10 percent increase in regulatory stringency (i.e. tighter restrictions on a common organophosphate insecticide) led to a 14.8 percent decrease on banana imports. The impact of technical regulations on developing country exports was examined in a World Bank Standards and Trade Survey covering 689 firms in 24 industries in 17 developing countries.[102] The results showed that exporting firms regard limited access to credit, low demand, and product quality as factors affecting export success. Production and investment costs are higher for firms that face technical regulations, but compliance costs account for only a small portion of the total costs as they are usually below 10 percent of investment amount. The cost to comply with multiple technical regulations, however, can become significant and limit export expansion opportunities for developing country firms.

A more recent OECD study by Swann (2010) mapping the standards literature across sectors shows that there is often, though not always, a positive relationship between international standards and trade.[103] The positive effect is mostly found in the manufacturing sector. The general trends are:

[100] *NMI (2008)*
[101] *Caswell and Joseph (2008)*
[102] *World Bank (2004). Industry sectors included textiles and apparel, raw agricultural products, processed food and tobacco, etc.*
[103] *The review focused on studies that made the minimum of theoretical assumptions in order to avoid an outcome where supposedly empirical results mainly reflect theoretical assumptions. This meant omitting studies which applied computable general equilibrium (CGE) models or partial equilibrium models to predict effects of harmonizing standards. It also excluded studies on SPS literature that reflect a firm consensus about the specific role of SPS, and which may not apply to other or all standards (Swann 2010)*

- When exporting countries use international standards, this has a positive (or at least neutral) effect on their export performance.
- When exporting countries use national standards, it may lead to superior export performance by that country.
- When importing countries use international standards, the most common effect is an increase in their imports.
- When the importing country uses national standards, the effects are more diffused. Studies looking exclusively at voluntary standards show that the effects are distributed evenly. For those looking at regulations or mandatory standards, the effect on imports tends to be negative.

Overall, the findings support the widely held view that international standards support trade. Findings on national or country-specific standards show both positive and negative effects, and thus only partially support the view that national standards create barriers to trade. Some studies also found that the effect of national standards on trade exceeds the effect of international standards. Existing evidence does not provide a single answer to the issue of trade effects, as it appears that this depends on how multiple economic effects interact, and is context-specific.

An important question to all this is what the effect of higher and stricter standards in the importing country has on a developing country's trade and consequently, on its poverty and income levels. This is mainly seen in the case of stricter EU food safety regulations and the effects on its developing country suppliers. An important study in this area is that by Maartens and Swinnen (2006). Their analysis of data covering a 15-year period (1991–2005) of fruit and vegetable exports from Senegal showed that:

- exports increased significantly despite increasingly strict EU food standards;
- higher exports had a positive effect on incomes of poor households;
- stricter standards led to structural changes in the supply chain (shift from smallholder production to large-scale estate production);
- despite the structural changes, the welfare effects for rural households remain strongly positive.

The supply chain restructuring changed the mechanism through which households benefit: through labour markets instead of product markets.[104] There is only limited discussion on quality issues regarding the impacts on quality of products with certification. The evidence is mixed in the coffee sector.

A case study quoted by the same authors of bean producers in Madagascar exporting to the EU found a rapid increase of exports within a period of 15 years despite stringent public and private safety and quality requirements. About 10,000 small farmers, with small plots of land averaging from 0.01 to 0.05 hectares, supplied one company that has contracts with major supermarkets in France, Netherlands, and Belgium. Farmers seem to have benefited from the high-standards contract production through a combination of different factors: (a) improved access to modern inputs and credit; (b) income from contract farming which constituted almost half of the family

[104] *Maartens and Swinnen (2006)*

income; (c) access to better technology and management practices; (d) more stable incomes and higher welfare.[105]

Another study by the same authors found that there is on-going consolidation of the export supply base in the developing countries as a result of increasing food standards in the importing countries. This is because small agro-food businesses, exporters, and farmers face financial, technical, and institutional constraints imposed by the implementation of these standards resulting in the weaker players exiting the export market. The trend is observed in the Kenyan and Zimbabwean fresh vegetable sector, which is becoming increasingly dominated by a few large agribusiness companies. Compliance with higher food standards and monitoring of this compliance requires tighter vertical coordination in the supply chain. Importers, processors, and distributors in high-standard markets procure from preferred suppliers usually on a contract basis to ensure large and consistent volumes of products with the required quality and safety. This pushes the entire food distribution system into more vertical coordination, which disadvantage smaller businesses leading to more consolidation at the supply end.[106]

Studies on harmonization of standards through econometric studies using data on mutual recognition agreements and other approaches show that harmonization has a positive effect on trade.[107] For more on harmonization and regulatory convergence, see **Appendix 5**.

[105] *Maartens and Swinnen (2008) citing Minten et al.*
[106] *Maartens and Swinnen (2008)*
[107] *Swann (2010)*

6. CONSIDERATIONS FOR GOVERNMENT IN USING VOLUNTARY STANDARDS AND CERTIFICATION AS POLICY INSTRUMENTS AND IN REGULATORY FRAMEWORK DEVELOPMENT

When sustainability is the objective, standards and certification are tools that need to be supported by complementary government policies, regulatory frameworks, and market mechanisms which would create the necessary enabling environment for their adoption. These measures could take the form of **national legislation**, **policies on public procurement**, **tax incentives**, or **start-up grants** among others. Governments can play a determining role, as in the case of organic standards, providing support through establishing national standards, and in cases where they pursue an active policy, by providing **technical assistance** to small producers and **promoting markets**. Governments can act as **managers of standards** or **regulators if voluntary standards represent the norm**. Sustainability as an issue seems to have marketing potential, but **public awareness and education** on sustainable choices and their impacts needs to be further supported.

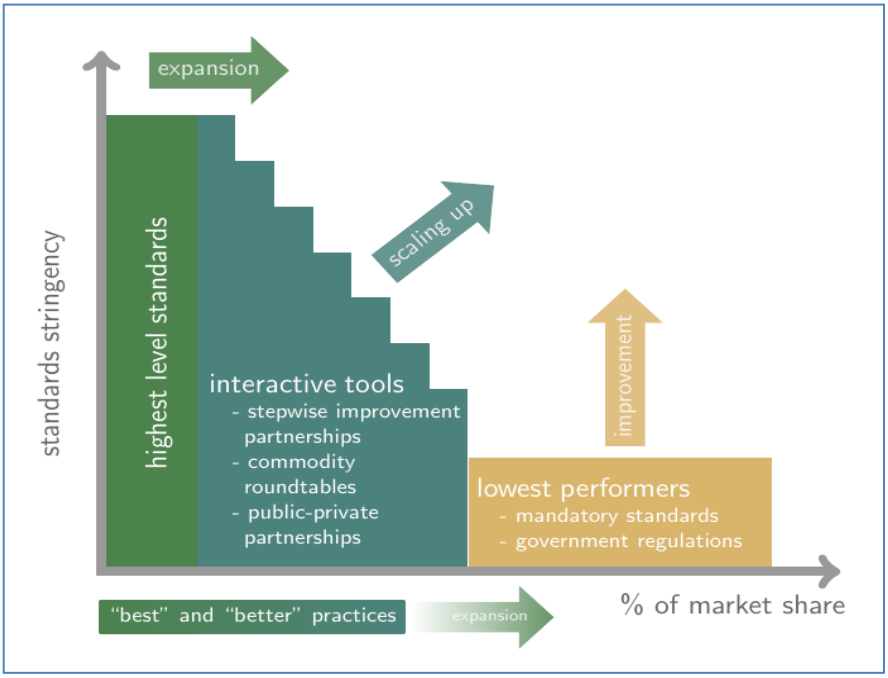
However, in order to support voluntary standards and certification systems in their use as effective policy tools, it is useful to understand and recognize the limits of such systems, and in choosing the most appropriate policy options or mix for the local conditions:[108]

- Standards that embed a great deal of technical knowledge – as may be seen in the number of versions and the specificity of its ratings, as well as undergoing continuous process of updating – seem to encourage the perception that they are credible and scientifically sound, and thus popular. The LEED standard, in the area of building construction and maintenance, is an example. The credibility of the certification is likewise important. The use of third-party certifiers helps increase credibility, as they are supposed to be independent auditors. Certification that is internal to the firm or self-certification, or within the industry association, raises a degree of skepticism.

- Certification programs, because they are voluntary, do not eliminate the weak performers. Raising the performance of those at the bottom of the industry, therefore, may not be the right tool, and regulation may instead need to be enforced. The figure below shows that voluntary systems have the flexibility to set high standards and create market incentives that recognize top performers. However, to move the market as a whole toward more sustainable practices requires government support in the implementation of complementary tools and regulations that help to improve the performance of middle and bottom performers. These tools need to recognize lower standards but should create a system of incentives that drive improvements in performance over time.

[108] *Matus (2009)*

Figure 10: Role of standards and tools and regulations in moving the market toward more sustainable practices



Source: Steering Committee of the State-of-Knowledge Assessment of Standards and Certification (2012)

- There are economic advantages in certifying products: price premium, increased market access, lower insurance rates due to decreased risks, and preferential tax rates or loan terms. They are significant incentives but not enough to effect a market transformation. For this, regulation may be required.

- For certification to be more widely adopted, capacity building and knowledge extension is needed. Who takes responsibility for this is an open question, and most likely will differ across sectors – in some cases it may be government, in others a private body. Capacity building is a tool to complement certification systems – it is a question of determining who is responsible for it, and linking it to the implementation of a program.[109]

- The forest certification case highlighted in chapter 5 above shows that it is very difficult to measure progress, especially when dealing with large geographical areas, like forests and fisheries, but with a small number of participants. Also, it highlights that there is no linear correlation between certification and impact. It must also be pointed out that a difference exists between the decision to adopt an environmentally beneficial practice, and the decision to certify. Certification does not always imply adoption of underlying practices (e.g. ISO 14000 where certification is for management systems, and not production); on the other hand, firms may still adopt even without certification. Moreover, if governments use voluntary standards and certification systems to achieve a public good objective (e.g. climate change or reduced pollution) it may be difficult to obtain the evidence that such systems are achieving this.

[109] *A few organizations have emerged to attempt to address this need. ISEAL (International Social and Environmental Accreditation and Labelling Alliance) is one such institution. ISEAL works with a range of voluntary standards systems, provide services, engage in trade and policy advocacy, and develop tools common among certification programs (e.g. auditing requirements). In Asia, especially in Southeast Asia, CertAll is doing significant work in addressing capacity building needs of producer groups and certification bodies, as well as linking local groups to international markets.*

- *Competing standards and target audiences*. An issue that might arise is whether the proliferation of so many standards in one area (e.g. food and consumer products) might result in label-fatigue among consumers. Certification as a tool is likely less effective in an area that is already crowded.

- *Distribution of costs and benefits among stakeholders*. Who bears the cost of restrictive standards? Cost distribution is an issue that is starting to gain attention as certification programs entail costs that are not uniformly distributed or cannot be universally recouped. Most of the time, the producing entity bears the costs of certification directly, and comply with complex documentation and monitoring requirements, all of which disadvantage small or less organized producers. Subsidization from the part of the government, or donor agencies, to organic farmers is what partly helped the growth of the organic sector.

- *Resource requirements for implementing standards*. This is not only limited to financial, but also include technical and human resources as well.

Taking the above into account, a government may decide that the most appropriate policy choice is to create regulatory systems of standards, certification and labelling. In such a case policymakers need to ensure the following attributes are carefully defined, established or considered:

- *Institutions and processes*. Inclusiveness and transparency are important in gaining acceptance and effectiveness of a standard. The most important questions that need to be addressed are: Who should be "at the table", and at what point in the process? Who participates in setting the initial goals? How much of a say do each of the stakeholders get?
- *Define goals*. Standards should have an underlying goal, and quantifiable with appropriate metrics.
- *Work out the standards*. Standards have to be credible, and each element of the standard has to relate back to the goal. At the same time, they need to be flexible to allow for technological developments or changing conditions, or amended goals. Flexibility and adaptability of the standards ensure long-term relevance. An option aside from the creation of altogether new standards would be to incorporate existing systems or parts of it into the regulatory framework. Decide whether the systems are to be mandatory or optional in effect (as in the case of EU–RED where fulfillment of sustainability requirements is required for biofuels to be counted against energy targets, but does not preclude importation of biofuels in general).
- *Outline the process for certification*. Should it be self-certification, second, third-party certification or combinations thereof. This process covers methods of measurement, sampling, inspection, and verification, as well as monitoring, sanctions, and penalties. An example of a penalty is the denial to or the revocation of the certificate, and the right to use the label. Probationary policies should also be developed to give non-compliant firms a second chance.
- *Incorporate monitoring and impact evaluation tools into the framework*. The importance of determining the performance, effectiveness, and impacts of the systems cannot be overemphasized.
- *Ensure that implementation arrangements and enforcement mechanisms are in place*.
- *Consider financing and expertise requirements for the entire process of standards development, implementation, and evaluation*.

- *Create or strengthen existing government support programs that will build capacity of small stakeholders, promote knowledge extension, and public awareness of the standards*.

Using voluntary standards and certification systems as regulatory instruments in the US

Case-studies from the US illustrate the use and adoption by government of standards into the regulatory framework, and provide an understanding of the institutional frameworks and processes necessary to accomplish this.[110] The US standards systems are primarily voluntary, private sector, and market-driven with many standard developers taking an active role. The government participates in the development process as a stakeholder but is not a driver of the process, compared to governments of other countries who play a more active role in a centralized process. The US government, however, relies on voluntary standards for procurement and regulation when the usage is consistent with regulatory objectives. As is being done by US government regulatory agencies, voluntary standards can be used to support regulation in the following ways:

- *Incorporation by reference*. An agency may adopt a voluntary standard without change by incorporating the standard in an agency's regulation or by listing/referencing the standard by title.

- *Strong deference*. An agency may grant strong deference to standards developed by a particular organization for a specific purpose. The agency will then use the standards in its regulatory program unless someone demonstrates to the agency why it should not.

- *Basis for rulemaking*. The agency reviews a standard, makes appropriate changes, and then publishes the revision in the Federal Register as a proposed regulation. Substantive comments received from the public during the rulemaking proceeding may result in changes to the proposed rule before it is issued as a final rule.

- *Regulatory guidance*. An agency may permit adherence to a specific standard as an acceptable, though not compulsory way of complying with a regulation. The agency provides in the rule text that a regulated entity may comply with the rule set out in the text, or may comply with a referenced voluntary standard.

- *Guidelines*. An agency may use standards as guidelines for complying with general requirements. The guidelines are advisory only and therefore compliance with them is not mandatory.

- *Deference in lieu of developing a mandatory standard*. An agency may decide that it does not need to issue a mandatory regulation because voluntary compliance with either an existing standard or one developed for the purpose will suffice in meeting the needs of the agency.

The US government's conformity assessment procedures provide assurance that the products and services regulated or procured by federal agencies have the required characteristics and/or perform in a specified manner. Agency conformity assessment procedures include:

[110] *http://ita.doc.gov/td/standards/United%20States/Use-of-Voluntary-Standards-in-Support-of-US-Regulation.pdf. The US is certainly not a singular example, but documentation of the US experience is more easily available and accessible through the Internet, than the example and experience of other countries*

- sampling and testing, inspection, and/or certification by the agency or other specified organization;
- licensing;
- product listing;
- the submission to an agency of manufacturing, operational, and related data for review;
- manufacturer self-declaration of conformity to agency requirements;
- mandatory labelling and advertising requirements; establishment of national requirements which are adopted/enforced at state and local government levels;
- issuance of regulatory guidelines; pre-marketing approval requirements;
- post-marketing monitoring requirements; and the conduct of environmental impact assessments.

While federal agencies may use a number of different conformity assessment approaches to achieve the required level of assurance of compliance, the US regulatory philosophy relies heavily on manufacturer's or supplier's declaration of conformity. The following institutional processes and conditions explain why this approach is successful in the United States:[111]

- the sometimes severe penalties imposed by the US legal and judicial system on products proven to be defective or hazardous to the public safety or environment;
- the US consumer has increasing access to information about poor quality or hazardous and defective products through various media;
- the size of the US marketplace and the ability of the US consumer to switch to a competing product if dissatisfied;
- US laws and regulations establish operational requirements for the US marketplace, such as truth in labelling and advertising.

[111] *http://www.nist.gov/standardsgov/standards-in-regulations.cfm*

7. CONCLUSIONS AND THE WAY FORWARD

Standards and certification systems have introduced new forms of partnerships and interactions between and among private sector actors, government, civil society, and consumers. The effective operations of sustainability certification schemes, and the degree of success in attaining their purported objectives, depend on the strength of these partnerships and interactions at all levels of governance. Context conditions, however, vary widely and are complex, and these can affect or interact with certification systems in ways that might limit the effectiveness, suitability, and impacts of certification. The importance of context is also underlined by findings at the broader level, as when looking at trade impacts across exporting and importing countries.

In terms of results, the mixed impacts at farm and community levels found in a large number of case studies and surveys of certification in the agriculture, forestry, and fishery sectors imply that certification may not be appropriate in all cases. The specific impacts, such as on incomes and farmer well-being so far seen are very context-specific, and cannot be generalized. There is an acknowledged lack of methodologies for measurement and analysis of impacts beyond the farm and community units. There is even less evidence on environmental impacts, and what is available (e.g. MSC certification) show almost no direct environmental benefit from certification. The impacts of certified production, overall, is regarded as limited thus far, and while certification has been shown to be feasible in certain markets, concrete effects on sustainability on the ground is difficult to ascertain. On the other hand, where certification seems to be gaining ground, such as in business-to-business transactions, the value relates more to reliability and risk reduction, than concern about the global commons.

The experience on certification in the agriculture natural resources sector generates valuable insights into what certification can accomplish, as well as its limitations. It also points to areas that need to be examined to enable certification systems to help achieve environmental, economic, and social objectives through its principles and criteria. Bioenergy-related standards and certification introduce new and complex criteria, including some of which are still undefined. As application of these systems is only recent, the impacts will not be seen for some time. All this lends a degree of uncertainty in whether these systems are appropriate. In terms of their being an adequate measure or intervention, the experience in other sectors seems to settle the question.

A thread that runs through this paper is the importance of context conditions in determining the success or failure of certification. This is well-illustrated in the experience of various sectors, and in various locations around the world, of which reviews and surveys consistently show that there are always those who will be better placed than others to reap the benefits of certification because the "correct" factors were in place when certification was introduced.
The limits of certification show that it should be regarded as a stand-in for any number of tools, but should not be looked at as the solution to complex sustainability challenges. In cases, however, where government may not be willing or not able to regulate, standards and certification can have a valuable contribution to public policy goals (e.g. forest conservation) by filling the gap. The market access benefits of certification, however, may be worth considering in certain contexts as some examples seem to indicate that they can lead to improvements in income and well-being at the household and community level. Caution is advised, however, in interpreting these results, as study methodologies widely vary, and applied to very different commodity and geographic contexts.

The option of using and adapting existing voluntary standards (e.g. IFOAM standards) to a specific agency's needs and objectives is preferable for governments wishing to develop and implement regulations, especially governments which may not have the financial and technical capacity to develop standards from scratch. In comparison with voluntary systems, national governments have at their disposal a much wider array of conformity assessment options, in addition to its inherent regulatory powers, and can thus, in principle, implement standards with stronger force more effectively. The caveat, however, for successful implementation is the combination of the existence of workable institutional frameworks (e.g. for enforcement) and of certain market attributes (e.g. more awareness among consumers).

APPENDIX 1: VOLUNTARY BIOENERGY SUSTAINABILITY STANDARDS AND CERTIFICATION SCHEMES

1. VOLUNTARY SCHEMES AND INITIATIVES

1.1 Bioenergy production and biofuels

i) Roundtable for Sustainable Biomaterials (RSB)

The RSB began as an initiative of the Swiss École Polytechnique Fédérale de Lausanne (EPFL) in 2007, and in collabouration with over 120 organizations in 30 countries from the public, private and non-profit sectors, developed international sustainability standards for biofuels. RSB formerly stood for Roundtable for Sustainable Biofuels, the name change occurring in March 2013 after its shift to an autonomous non-profit organization. The change reflects the expansion of the scope for the RSB standards, from biofuels only to now include other products derived from biomass. This includes biofuels, bioelectricity, biochemicals, and bioplastics such as packaging, cosmetics, and food additives.[112] The RSB standard includes principles and criteria, as well as minimum and progress requirements for the following: (a) legality; (b) planning, monitoring, and continuous improvement; (c) GHG emissions; (d) human and labour rights; (e) rural and social development; (f) local food security; (g) conservation; (h) soil; (i) water; (j) air; (k) use of technology, inputs and management of waste; and (l) land rights.

RSB has a GHG minimum requirement of 50 percent for biofuel blends compared to the fossil fuel baseline, increasing over time. RSB's GHG calculation methodology is based on a well-to-wheel approach and includes emissions from land use change, including above and below ground carbon stock, and the use of co-products, residues and wastes. Indirect land use change will also be considered. RSB developed several guidance documents to assist in the conduct of Environmental and Social Impact Assessment (ESIA) that covers social guidelines, ecosystem and conservation values, and soil and water guidelines.

The RSB, based on extensive consultation in 2012, has decided to address indirect effects through a less controversial approach called the Low Indirect Impact Biofuels (LIIB) approach. The approach encourages biomass production and processing practices that pose less risk of displacement and competition with food, feed, and fiber, e.g. the use of wastes and residues, and use of idle lands do not increase pressure over arable land by diverting raw material from the existing supply. The RSB proposes LIIB as an alternative to ILUC factors, and as a point of consideration by the European Commission, as LIIB is seen as more acceptable to industry players.[113]

RSB adopts a meta-standard approach, with a generic standard wherein options for implementation are open. Option 1 allows the certification of crops by a qualifying standard and not by the RSB generic standard. Option 2 develops a general certification system for all biomass feedstocks not covered by a sustainability standard.

RSB has developed various sets of requirements: a set of additional requirements, and standard requirements which include supply chain requirements or chain of custody, accreditation and verification requirements. The tracking of chain of custody models are: identity preserved,

[112] *http://rsb.org/pdfs/Newsletters%20&%20Bulletins/RSB_Newsletter_July%2013.pdf*
[113] *http://rsb.org/pdfs/Newsletters%20&%20Bulletins/RSB_Newsletter_July%2013.pdf*

segregation and mass balance based on ISO standards (ISO Guide 65, ISO 19011, and ISO 17011). RSB was recognized by the EC as a voluntary scheme in 2011.

In 2013, RSB launched two initiatives aiming at smallholders: one is linking them to biofuels markets through RSB certification; and testing the draft standard for smallholder groups.[114]

ii) International Sustainability and Carbon Certification (ISCC)

The ISCC began as a project that was finalized in Germany in 2010, and is aimed at establishing an international certification system for biomass and bioenergy, covering all relevant raw materials from the forestry and agriculture sectors. The ISCC was developed to comply with the ordinance on sustainable production of biofuels for transport and liquid biofuels for electricity. The following principles and criteria comprise the ISCC standard: (a) biomass shall not be produced on land with high biodiversity value or high carbon stock, peatland and high-conservation value; (b) environmentally responsible production; (c) safe working conditions; (d) biomass production shall not violate human rights, labour or land rights; (e) compliance with national laws and international treaties; and (f) good management practices.

ISCC's certification criteria cover requirements for the following: (a) sustainability in biomass production including protection of areas of high-conservation value areas and with high carbon stock, as well as peatland, and sustainable management of farms; (b) GHG emission savings and calculation methodology; and (c) traceability and mass balance. International ISCC standards can be adapted to local conditions through the National or Regional Initiatives (Technical Working Groups).

Social criteria are assumed to be fulfilled for countries that have ratified the ILO conventions. ISCC requires a GHG emission reduction of 35 percent. ISCC's GHG calculation methodology considers all emissions in the life cycle of the production chain, including transport and by-products. The methodology also takes into account emissions from land use change based on the ISO standards and GBEP's "Common Methodological Framework for GHG Emissions due to Bioenergy." Traceability will be determined through mass balance or physical segregation methods.

ISCC can operate as a meta-standard, and can endorse other certification systems provided they comply with ISCC requirements. Two different certificates can be issued by ISCC: (a) certificates for sustainable farming, that can issued to farms; and (b) chain of custody certificates for all those involved in the supply chain. The ISCC was recognized as a voluntary scheme by the EC in 2011.

iii) CEN (European Committee for Standardization)

A technical committee (CEN/TC 383) for "Sustainably produced biomass for energy applications" was established by the European Committee on Standardization (CEN) in 2008 tasked to develop a European standard for sustainable biomass for energy applications (transport, heating, cooling, and electricity). The work is assist economic operators in providing evidence for the provisions relating to the EU sustainability criteria for biofuels and bioliquids. Working groups formed for the following areas, corresponding to the four parts of the standard, EN 16214: (1) terminology; (2) conformity assessment including chain of custody and mass balance; (3) biodiversity and environmental aspects; and (4) calculation method for the GHG emission balance using a life cycle approach.[115] Parts 1, 3, and 4 have been finalized by the committee and published as of January

[114] *http://rsb.org/pdfs/Newsletters%20&%20Bulletins/RSB_Newsletter_July%2013.pdf*

[115] *http://www.cen.eu/cen/Sectors/TechnicalCommitteesWorkshops/CENTechnicalCommittees/Pages/TCStruc.aspx?param=648007&title=CEN/TC%20383*

2013; part 2 is still being worked on but is expected to be published as Technical Specification before the end of 2013.[116]

The CEN standard provide requirements and evaluation methodologies on biodiversity, soil, water and air quality, land use change and loss of carbon stocks. Social requirements are also provided for (labour conditions, local employment and welfare), competition with food, and land use rights. Indirect effects are also taken into account.

Existing relevant international standards are incorporated into the CEN standard, in particular ISO standards. These include principles of management standard series such as ISO 9000, ISO 14000 and ISO 26000, as well as ISO 14040 for Life Cycle Assessment and ISO 14064 series for GHG Accounting and Verification for the GHG calculation methodology.

Minimum criteria is introduced into the European CEN standard in order to promote harmonization of principles and criteria in the EU, and facilitate compliance with EU–RED.

iv) International Organization for Standardization/Technical Committee 248 (ISO/TC 248)

The International Organization for Standardization (ISO) is developing an international standard to address sustainability issues related to bioenergy production. The project committee ISO/TC 248 held its first meeting in 2010. There are 32 participating countries, while 12 countries are observers. The committee will develop globally harmonized sustainability criteria that will address social, economic, and environmental aspects of the production, supply chain, and use of bioenergy. The committee will develop a global standard (ISO 13065) on sustainability of biomass and conformity assessment including chain of custody. The standard will contribute to dealing with related social and environmental issues, and help avoid technical barriers to trade and building competitiveness of the bioenergy sector.

Four working groups have been formed to deal with cross-cutting issues (including terminology, verification, and audit), greenhouse gases; environmental, economic and social aspects; and indirect effects.[117] Since June 2013, the committee draft study/ballot has been initiated. The target publication date of the standards is April 2015.[118]

1.2 Biofuels feedstock

There exist several certification schemes applicable to the agriculture sector, aimed at ensuring the provision of safer and healthier products produced using environmentally friendly or sustainable farming practices. These schemes address a core set of concerns namely, agrochemical use, food safety conditions, traceability, and environmental aspects. Biofuels from tropical countries (such as sugarcane ethanol and palm oil biodiesel) have higher yields and better GHG balances than biofuels from temperate region, they also have more significant adverse impacts on the environment. Certification schemes for biofuels feedstock grown in the tropics thus needed to be developed to address sustainability concerns specific to the crop and to the region.

[116] *http://www.cen.eu/cen/Sectors/Sectors/UtilitiesAndEnergy/Fuels/Pages/Sustainability.aspx*
[117] *http://www.iso.org/iso/iso_technical_committee?commid=598379*
[118] *http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm?csnumber=52528*

i) Roundtable on Sustainable Palm Oil (RSPO)

The RSPO was established in 2004 in Switzerland with the Secretariat in Malaysia, aimed at promoting the growth and use of sustainable palm oil as well as developing global standards for sustainable palm oil.

The RSPO criteria cover economic, social, and environmental aspects, as well as management aspects in the plantation and processing stages: (a) transparency; (b) compliance with relevant laws and regulations; (c) commitment to long-term economic and financial viability; (d) use of best practices by growers and millers; (e) environmental responsibility and conservation of natural resources and biodiversity; (f) responsible consideration of employees, individuals, and communities; (g) responsible development of new plantings; and (h) commitment to continuous improvement in key areas. The principles and criteria focus on the production stage, and do not cover the transport and processing of palm oil products. A set of guidelines and a methodology intended for national interpretation of the principles and criteria have been developed. It provides for addressing key concerns at sub-national levels, and complementing national laws with a higher benchmark, if necessary.

The RSPO certification system was launched in 2007. The first national interpretations of the generic principles and criteria were approved, for Indonesia, Malaysia, and Papua New Guinea. The RSPO Principles and Criteria Guidance for independent smallholders for group certification were adopted in 2010, and the RSPO trademark was launched in the following year. In 2012, the number of members exceeded 1,000 from over 50 countries.[119] In June 2013, annual production capacity of global crude oil certified to RSPO has reached 15 per cent.[120] In November 2012, the EU approved palm oil-based biodiesel for the renewable fuels standard provided it is certified under the RSPO (the EU is the world's largest buyer of RSPO-certified palm oil, and the second largest importer of palm oil). The move has been criticized by environmental activists warning that without stronger safeguards, palm oil production could increase deforestation and GHG emissions. Another issue raised is the absence of criteria for GHG accounting in the RSPO standards; this lack of carbon standards is a criticism that has been raised even by the members of the academe. The continued certification of palm oil grown on carbon rich peat forests is considered by activists as one of RSPO's major failures until now.[121]

ii) Better Sugar Initiative

The BSI began as collabouration between 30 global stakeholders in 2005 to identify key social and environmental impacts of sugarcane production. The initiative aimed at promoting sustainable sugarcane production and the reduction of economic, environmental, and social impacts of sugarcane production and primary processing. Stakeholders came from producer groups, unions, banks, traders, branded goods companies, research institutes, NGOs, and intergovernmental organizations. BSI published in 2010 the Production Standard, which included principles and criteria for sustainable production, and the Chain of Custody Standard, which contained technical and administrative requirements for tracking along the entire supply chain, from production all the way to final use.

The BSI standard includes the following principles on economic, financial, environmental, and social aspects: (a) obey the law; (b) respect human rights and labour standards; (c) manage input, production and processing efficiencies to enhance sustainability (d) actively manage biodiversity

[119] *http://www.rspo.org/en/milestones*
[120] *http://www.rspo.org/news_details.php?nid=162&lang=1*
[121] *http://news.mongabay.com/2012/1128-rspo-palm-oil-ok-in-eu.html*

and ecosystem services and (e) continuous improvement in key areas of the business. The BSI GHG calculation methodology takes into account emissions associated with direct land use change, but not indirect land use change.[122]

iii) Roundtable for Responsible Soy Production (RTRS)

The RTRS was established in 2006 to promote sustainable soy production, processing, and trade with reduced environmental and social impact, at the same time maintaining or improving the livelihood of producers. This was a response to the devastating impacts of soy production on South America's ecosystems. The initiative involved soy producers and traders, manufacturers, finance institutions, retailers, feed companies, and NGOs.

The RTRS framework includes: (a) standard for responsible soy production, ban on conversion of areas with high-conservation value to agricultural land, promotion of best management practices, fair labour conditions, respect for land tenure claims; (b) certification standards; (c) chain of custody standards; (d) certificate trading platform that enables a soy grower to participate even if they do not have access to fully separated responsible soy supply chains; (e) code of conduct; and (f) grievance procedure.

The RTRS standard version 1.0, released in 2010, is composed of five principles and 27 criteria. The standard covers the following principles: (a) legal compliance and good business practices; (b) responsible labour conditions; (c) responsible community relations; (d) environmental responsibility; and (e) good agricultural practices.

National Interpretations of the standards for Uruguay, Argentina, and India have been approved. RTRS was recognized by the EU as a voluntary scheme in 2011. The first South American soy producers were certified on the same year. The RTRS has 150 members from around the world.[123]

Environmental activists criticize RTRS for ignoring the genetically modified soy issue and weakening the requirements around deforestation and labour conditions. Majority of the certified soy will be GM soy, which studies have claimed to have shown more negative effects on people's health and the environment than non-GM soy. The deforestation clause, on the other hand, of RTRS allows soy cultivation to replace natural habitat under certain circumstances.[124]

iv) Green Gold Label

The Green Gold Label (GGL) established in 2002, is a certification system for sustainable biomass covering production, processing, transport and final energy transformation. GGL provides standards for specific parts of the supply chain, and standards for tracking and tracing the origins of the biomass. GGL comprises different sets of standards for each of the following, under which certain principles and criteria have to be fulfilled: (a) chain of custody and processing – producer or trader; (b) agriculture source criteria; (c) transaction and product certificate; (d) forest management criteria; (e) power company criteria; (f) conservation stewardship criteria; (g) GHGs and energy balance calculation standard; (h) chain of custody and processing standards; and (i) transaction certificate.

[122] *http://bonsucro.com/site/standard-development/*
[123] *http://www.responsiblesoy.org/*
[124] *http://www.toxicsoy.org/toxicsoy/RTRS_files/RTRS%20backgrounder%20v2.pdf*

As of May 2013, GGL is awaiting approval from the European Commission for the newly developed GGL-RED to comply with the EU–RED requirements for recognition as a voluntary scheme.[125]

1.3 Household bioenergy technologies

i) Improved cookstoves

Cookstove efficiency in the developing world has been identified as a major area needing improvement, inasmuch as about 3 billion people worldwide rely on coal or biomass as the primary energy source for cooking and heating, which make up 13 per cent of global energy consumption. Open fires and traditional stoves have low combustion efficiency resulting in longer cooking time and inefficient use of fuelwood, and pose a risk to health especially of women and children. It also leads to environmental problems through unsustainable collection of wood for fuel, leading to forest degradation, loss of biodiversity and natural habitats.[126]

The lack of international standards and limited testing capabilities in the individual countries have been identified as major factors that hamper widespread adoption of clean cookstoves. The absence of objective certification to validate the efficiency and GHG emission reduction claims of manufacturers is causing uncertainty in the clean cookstove market.[127]

In early 2011, the international stove community defined steps toward establishing standards for clean cookstoves. In a February 2013 meeting jointly convened by the Alliance and the US Environmental Protection Agency's (EPA) Partnership for Clean Indoor Air, and chaired by the International Organization for Standardization (ISO), stakeholders from 23 countries reached a consensus on an International Workshop Agreement document. The Agreement provides guidance on four performance indicators: (a) fuel use; (b) total emissions; (c) indoor emissions; and (d) safety. Each indicator will have tiered standards aimed at improving performance across the supply chain.[128] A proposal for a new field of technical activity called "Cookstoves and clean cooking solutions" was submitted to ISO in March 2013, which will be voted on by ISO member bodies within three months of submission. Once the proposal is approved, an international working group will be established to prepare draft standards, thus continuing the ongoing standards development efforts.[129]

The Global Alliance for Clean Cookstoves (GACC) is a major player in the cookstove community. It supports the formal international standards development process through formulation of interim guidelines for standardized reporting, evaluation of options for standards frameworks, and conduct of studies to build evidence base required to establish standards. Further, through its Standards and Testing Program, testing protocols will be developed and refined, and enhancing testing capacity will be done through a global network of regional testing and knowledge centers (RTKCs).[130]

ii) International Biochar Initiative (IBI) Biochar Standards

The IBI started work on the development of standards in 2009, through an inclusive process with the international Biochar community. The open and transparent process allows other entities to

[125] *http://www.greengoldcertified.org/site/pagina.php?id=9*
[126] *https://sites.google.com/a/ncsu.edu/khopkarworldforestry/*
[127] *http://www.cleancookstoves.org/resources/fact-sheets/igniting-change.pdf*
[128] *http://www.cleancookstoves.org/our-work/priorities/promote-standards.html*
[129] *R. Chiang (Personal communication, April, 22 2013)*
[130] *http://www.cleancookstoves.org/blog/standards-and-testing-2012-highlight-and-2013-outlook.html*

easily adopt the Standards as the basis for their own regulatory or certification programs. The IBI membership approved the initial version of the draft standards in May 2012. In April 2013, IBI published version 1.1 to address technical program revisions.

The IBI Biochar Standards provides the tools for a universal and consistent definition for Biochar, as well as to confirm that a product intended for sale or for use as Biochar has the necessary characteristics for safe use. The Standards also provide common reporting requirements that will assist efforts to link specific functions of Biochar to its beneficial soil and crop impacts.

The IBI Certification Program is currently under development. Manufacturers who have fulfilled the IBI standards would be able to apply for certification and to use the "IBI Biochar Certified" seal on their product.[131]

1.4 Framework for life cycle analysis

i) GBEP life cycle analysis of bioenergy

Numerous studies have looked into the potential of biofuels to reduce GHG emissions compared with the fossil fuels they would replace. These studies have shown differing results, depending on the assumptions used for the calculations. GBEP's Task Force on Methodologies developed a common methodological framework that could be applied to the life cycle analysis of bioenergy, which aimed at improving the acceptance of the results and to foster transparency in the process of estimating.

Version Zero of a Common Methodological Framework for GHG Life cycle Analysis of Bio energy was released in June 2009 for initial dissemination and testing. Version one was published in January 2011. The framework serves as guidance and provides a template for life cycle analysis to be used to calculate GHG emissions, and enable comparisons on an equal basis. The framework consists of a 10-step analysis covering the emissions from biomass feedstock production, including land use change, co-products and by-products, transport of biomass, conversion, transport of fuel and fuel use. The framework includes options for reporting direct land use change or indirect land use change, or a combination of both.[132]

1.5 Scorecards

i) WB/WWF Biofuels Environmental Sustainability Scorecard

The Biofuels Environmental Sustainability Scorecard was launched in 2008 under the initiative of the World Bank and the World Wildlife Fund and is a tool that can be useful for initial screening of biofuel projects. The Scorecard provides an indication of whether a proposed biofuel project will likely have a net positive or negative impact on the environment. The coverage is global, all feedstocks and types of biofuel, from production to processing. The Scorecard facilitates consideration of key environmental and social issues in biofuel projects. The descriptive scoring system allows the user to:

- compare different biofuels and biofuel production systems across key environmental sustainability criteria
- understand what kind of changes to production systems would result in more sustainable production

[131] *http://www.biochar-international.org/characterizationstandard*
[132] *http://www.globalbioenergy.org/fileadmin/user_upload/gbep/docs/2009_events/7th_SC_NY/GBEP_GHG_report_2306.pdf*

- track progress in improving sustainability.

The Scorecard is divided into four components: (a) must haves (attributes that a project needs to have to fulfill the sustainability test); (b) project design; (c) management; (d) and social/labour issues.[133]

ii) Inter-American Development Bank (IDB) Biofuels Sustainability Scorecard

The IDB Biofuels Sustainability Scorecard was created by the Sustainable Energy and Climate Change Initiative (SECCI) and the Structured and Corporate Finance Department of the IDB, based on the sustainability criteria of the Roundtable for Sustainable Biofuels. The objective of the Scorecard is to provide a tool to assess the various complex issues from the field to the tank, encouraging higher levels of sustainability in projects. The Scorecard does not replace certification schemes and life cycle assessment tools, but can be used to inform these processes.

The Scorecard addresses environmental and social sustainability aspects specific to biofuels projects, although there are other important factors that are not taken into account, e.g. economic sustainability. It was designed specifically for use of the private sector at the project level, although it could also be used as a conceptual tool in outlining assessment criteria for biofuels development. The Scorecard was designed to be used at multiple stages of a project life cycle. It can be used in project development, project screening, initial analysis, throughout due diligence, and investment approvals. Users can identify areas that can be improved and then measure the impact of changes in different areas.[134]

1.6 Sustainability frameworks and tools for policy formulation

i) Global Bioenergy Partnership (GBEP)

The GBEP was established in 2008 through the initiative of the G8 countries and five additional countries (Brazil, China, India, Mexico, and South Africa) to promote the development of biomass and biofuels, and to develop an international sustainability framework for bioenergy. GBEP was launched during the 14th session of the UN Commission on Sustainable Development in 2006. As of 2013, GBEP is composed of 23 countries, 14 international organizations, as observers, 25 and 10 international organizations and institutions. GBEP's program of work identifies the following priority areas to: (a) facilitate the sustainable development of bioenergy; (b) test a common methodological framework on GHG emission reduction measurement from the use of bioenergy; (c) facilitate capacity building for sustainable bioenergy; and (d) raise awareness and facilitate information exchange on bioenergy.

The GBEP sustainability indicators for bioenergy were launched in November 2011, developed by a Task Force composed of GBEP partners and observers. The 24 voluntary sustainability indicators serve as a guide to inform decision making at the national level. The GBEP work addresses all forms of bioenergy. The indicators do not provide directions, thresholds or limits, and do not constitute a standard. They are not legally binding on GBEP partners. The indicators, measured over time, will show progress toward or away from a sustainable development path that was determined nationally. The indicators serve as starting points from which policymakers and stakeholders can identify and develop measurements as well as domestic data sources deemed relevant to the national needs.

[133] *http://www.fao.org/bioenergy/20548-0e3bfa02bfb74ce060268a4bbe61efba3.pdf*
[134] *http://www.iadb.org/biofuelsscorecard/*

The GBEP criteria includes a set of indicators, that can be interpreted according to national circumstances. The criteria cover a range of sustainability issues grouped under three pillars:

1. *Environmental impacts*: GHG emissions, land and ecosystems, air quality, water availability, use efficiency and quality, biological diversity and land use change, including indirect effects.
2. *Social impacts*: food security, access to land, water and other resources, rural and social development, access to energy, labour conditions, human health and safety.
3. *Economic and energy security impacts*: economic development, economic viability and competitiveness, access to technology and energy security.[135]

A recent meeting of the GBEP Working Group on Capacity Building for Sustainable Bioenergy (May 2013) discussed the first lessons learned in testing the GBEP sustainability indicators. The lessons were derived from experiences with five of the GBEP pilots: Indonesia, Ghana, Germany, Colombia, and the Netherlands. The pilots were to assess the practicality and applicability of the methodology as a policymaking tool, as well as for policy evaluation and monitoring. It was found that indicators were considered valuable to support fact-based and high-quality policy development. Some indicators faced data availability and quality issues, and an international expert exchange platform is being recommended to further develop the methodology.[136]

ii) The Bioenergy and Food Security (BEFS) Analytical Framework

The BEFS project was initiated by the Food and Agriculture Organization (FAO) to address the need to balance and consider jointly the many complex issues that link bioenergy and food security. The BEFS Analytical Framework provides the tools aimed at assisting policymakers in formulating informed decisions related to the development of their bioenergy sector and its potential role in food security and poverty reduction. The BEFS approach utilizes country level information and cross-institutional stakeholder dialogue to support evidence-based decision-making process.

The key elements of this approach are: institutionalized dialogue among relevant national stakeholders, assessment of sustainable bioenergy potential (based on land suitability, production costs, and analysis of environmental and socio-economic dimensions), risk prevention and management, investment screening, impact monitoring and evaluation, and capacity building at both technical and policy levels.

The framework has been implemented in Peru, Tanzania, and Thailand. Malawi is now developing its BEFS Roadmap, and work is continuing in Sierra Leone to assess the country's sustainable bioenergy development potential.[137] The Association of Southeast Asian Nations (ASEAN) has requested FAO for technical support in the use of BEFS to evaluate the impact of bioenergy policies in ASEAN member states, and the impact of regional bioenergy developments on food security. The BEFS ASEAN project meeting was first held in October 2012. BEFS country briefs are now being prepared by FAO.[138]

[135] *http://www.globalbioenergy.org/aboutgbep/history/en/*
[136] *http://www.globalbioenergy.org/fileadmin/user_upload/gbep/docs/2013_events/4th_WGCB_Berlin_29-30_May_2013/2905_6_-_VAN_KEULEN.pdf*
[137] *http://www.fao.org/energy/befs/en/*
[138] *http://www.fao.org/energy/befs/78757/en/*

1.7 Carbon emission standards

i) Gold Standard

The Gold Standard (GS) is a certification standard for carbon mitigation projects that is internationally recognized as the benchmark for quality in both the compliance and voluntary carbon markets. The GS was established by the World Wildlife Fund and other NGOs in 2003 in order to demonstrate that carbon markets could deliver capital efficiently to greenhouse gas mitigation projects. GS projects are continuously monitored, reported, and verified for both real and permanent emission reductions and sustainable development.

A range or projects are eligible to register with the GS:

- *Renewable energy*: such as solar, biomass, biogas, liquid biofuels for electricity, wind, geothermal, hydro
- *Energy efficiency*: industrial, domestic, transportation, public sector, agricultural sector and commercial sector
- *Waste handling and disposal*: waste handling activities that deliver energy or a usable product with sustainable development benefits (e.g. composting)
- *Land use and forests*: including new forests and agroforestry, forest management and smart agriculture.

The GS certification scheme covers environment, social, and economic aspects. Environment requirements include indicators for soil, forest, biodiversity, waste, water, energy use and management, and carbon. Social indicators include for social/human rights, labour rights (conditions of work and conditions of employment, and empowerment of workers.

The GS certification process involves nine distinct steps that cover consultations and feedback, and reviews and verification at various stages before issuance of credits. A project must adhere to the requirements and guidelines under Gold Standard version 2.2, comprising GS Requirements and Gold Standard Toolkit. The GS adopts all methodologies approved by the Executive Board of the Clean Development Mechanism that meet GS scope and eligibility criteria for projects in both compliance and voluntary markets. All GS projects have to undergo validation and verification by a Designated Operational Entity (DOE), an independent auditor accredited by the UNFCCC CDM Executive Board to validate project proposals or verify achievement of GHG emission reduction targets in implemented projects.

Since its establishment, more than 800 low carbon GS projects have been listed, mainly in China, India, Turkey, and Africa. This is equivalent to more than 6 million GS credits that have been issued in the voluntary markets, and almost 1 million in the compliance market.[139]

[139] *http://www.cdmgoldstandard.org/frequently-asked-questions/gold-standard-foundation*

APPENDIX 2: CLIMATE-FRIENDLY AGRICULTURE STANDARDS AND SUSTAINABLE FARMING CERTIFICATION PROGRAMS

1. ORGANIC STANDARDS

1.1 International Federation of Organic Agriculture Movements (IFOAM)

IFOAM is the global umbrella organization for the organic agriculture movement, with 750 member organizations in 108 countries. The initiative began during an international congress on organic agriculture organized by Nature and Progress, a French farmer organization, in 1972. The IFOAM Standard is an internationally applicable standard that can be applied directly for certification. The IFOAM passed the first international standards for organic agriculture – the IFOAM Basic Standards – in 1980. Based on existing private organic standards at that time, it became the standard for standards. Since then, the Basic Standards have been the basis for private organic standards and regulations around the world, influencing major systems such as EU Regulation 834/2007 and FAO's Codex Alimentarius Guidelines for organic production.

The IFOAM Basic Standards set out the principles, recommendations, and baseline requirements for operators in the production of organic crops, and maintaining organic integrity in the handling and processing of organic products. The IFOAM Basic Standards, together with the IFOAM Accreditation Criteria for Certification of Organic Production and Processing, constitute the IFOAM Norms which form the basic pillars of the IFOAM Organic Guarantee System (OGS).[140] Between 2003 and 2010, OGS underwent a major revision process which resulted in the development of the following elements:[141]

- IFOAM family of standards – aimed at distinguishing between credible organic and non-organic standards while acknowledging need for diversity and local adaptation of standards, improving transparency and public awareness, and facilitating equivalence agreements[142]
- the IFOAM Standard
- the Global Organic Mark
- the IFOAM Accreditation and the IFOAM Global Organic System Accreditation.

2. SUSTAINABLE FARMING CERTIFICATION PROGRAMS

2.1 National sustainable agriculture standards

The Sustainable Agriculture Standard is an initiative begun in 2008 by various US stakeholders to establish a comprehensive, continuous improvement framework along the agriculture supply chain, and to develop a common set of economic, environmental, and social indicators aimed at determining whether an agricultural crop has been produced and handled in a sustainable manner. The national standard aims at supporting producer efforts to adopt sustainable practices, providing a means of clear communication of sustainability achievements, and harmonizing the various sustainable agriculture standards that are in place or in development, as well as avoiding confusion among consumers.

[140] *http://www.organic-world.net/ifoam-norms0.html*
[141] *http://www.ifoam.org/en/value-chain/ifoam-organic-guarantee-system*
[142] *http://www.ifoam.org/en/ifoam-family-standards*

The Sustainable Agriculture Standard Development Committee tasked with the development of the standards, is composed of 58 representatives from all areas of the agriculture sector, including commodity producers, processors, retailers, as well as from environmental, labour and development organizations, NGOs, business, academe, among others.

In April 2012, a draft National Sustainable Agriculture Standard (LEO-4000) was released for review by the Committee. The standard has the following components: principles, criteria, indicators, performance levels, and tiers. Each tier has required or optional performance levels. Principles cover social (including labour and community rights), environmental, and economic aspects translated into criteria and their associated indicators. As the time of writing this report, there is a move to pilot test the standard. Leonardo Academy, which is accredited by the American National Standards Institute, is providing the process administration in the development of the standard.[143]

2.2 Sustainable Agriculture Network's Agriculture Standard

The Sustainable Agriculture Standard covers requirements for the environmental, social, labour, and agronomic management of farms that cultivate crops that are part of the Sustainable Agriculture Network's (SAN) certification program. SAN a coalition of non-profit, independent conservationist organizations formed in 1997, and aimed to link producers and consumers through the Rainforest Alliance Certified seal of approval. The founding members are conservation organizations in Latin America founded in the mid-1980s and the 1990s who, seeing the need for coordination, decided to form the SAN network, in partnership with Rainforest Alliance.

The SAN Agriculture Standard outlines principles that cover social and environmental management systems, ecosystem conservation, wildlife protection, water conservation, working conditions, occupational health, community relations, integrated crop management, soil conservation, and integrated waste management. The range of products certified to the SAN standards has grown significantly and can now be applied to over a hundred crops. These crops include soy, sugarcane, coffee, soy, peanut, sunflower, tea, among many others.[144]

3. ALTERNATIVE CERTIFICATION AND PARTICIPATORY GUARANTEE SYSTEMS

3.1 Certified Naturally Grown (US)

Certified Naturally Grown (CNG) is a non-profit organization founded in 2002 offering certification for small-scale, direct-market farmers and beekeepers using natural methods. CNG is based on the Participatory Guarantee System (PGS) model of certification. CNG is a "grassroots alternative" to the US Department of Agriculture's National Organic Program (NOP) meant primarily for small farmers distributing through local channels such as farmers markets, roadside stands, local restaurants, community-supported agriculture programs, and local grocery stores.

The CNG standards and requirements are based on the USDA's NOP rules. An alternative was found necessary because once the NOP was implemented in 2002, farmers who referred to

[143] http://www.sustainableagstandard.org/
[144] *http://sanstandards.org/sitio/subsections/display/9*

themselves as “organic” for decades were not disallowed to do that as the term “organic” became strictly reserved to those who were certified by USDA-sanctioned agency. Many small farmers, most of whom grow a wide range of crops in diverse family-sized farms, could not afford the financial costs and found the paperwork requirements too complex. The need for an alternative program and a “new label” gave impetus for the CNG initiative that began soon after NOP came into effect.

The crux of the CNG program is the farmer-to-farmer inspection approach. Certification is offered for produce, livestock, and beekeeping operations. Certification applications can be made online, after which an annual financial contribution is required. Signed Declaration of Fulfillment of CNG Standards is posted online and can be viewed by other members. Within a certain period after being accepted into the program, on-site inspections have to be conducted, and on an annual basis thereafter. All participating farmers and growers are required to conduct inspection of at least one other farm annually. In order to maintain integrity, “trading” inspections are prohibited.[145]

CNG participants are given access to use the CNG seal on their websites, documentation, and products. There are 350 farmers who are enrolled in the program from nearly 50 states, making it the largest guarantee program in the US for those organic farmers who do not wish to participate in the USDA NOP.[146]

3.2 Ecovida Agroecology Network (Brazil)

Prior to the formal creation in 1988 of the Ecovida Agroecology Network in Brazil, many of the Ecovida groups were already in existence. These groups were formed when the need rose to develop alternatives after the disastrous effects of the Green Revolution started to be felt. The concept of agro-ecology was promoted, embodying a new ethical paradigm that upheld respect for the environment and local culture, solidarity and cooperation. Ecovida’s model for participatory certification was developed as an alternative approach, mainly in response to the Normative Instruction (NI 07/99) of the Ministry of Agriculture introduced in 1999. The NI required high certification costs and introduced methods that were regarded by the groups as inappropriate to the reality of the peasant and small holder.

Ecovida is present in 180 municipalities involving 2,400 farming families (approximately 12,000 individuals) organized into 270 groups, associations, and cooperatives. Membership also includes 30 NGOs, 10 ecological consumer cooperatives, and a number of professional and support organizations. The entire membership is organized into 21 regional nuclei, at different stages of organization. Ecovida groups sell in local farmer markets, supermarket chains, institutional settings (hospitals, public schools), specialty shops, and a fifth of the products are sold to the export market. Most of what is exported is additionally certified by an internationally recognized certification body.

[145] *http://www.naturallygrown.org/*
[146] *Participatory Guarantee Systems: Case studies from Brazil, India, New Zealand, USA. IFOAM, February 2006*

APPENDIX 3: ECO-FRIENDLY LABELLING AND SUSTAINABILITY CERTIFICATION PROGRAMS

1. FORESTRY CERTIFICATION SCHEMES

The forest sector has developed the more comprehensive sustainability certification schemes. This is partly explained by the strong engagement of many governments, NGOs, and industry representatives in the process. These forest certifications schemes are aimed to achieve a range of goals that include preventing deforestation and forest degradation, and maintaining biodiversity. Forest certification also attempts to guide the forest sector toward a holistic approach through sustainable forest management with emphasis on the global environmental, economic, and social, impacts of practices.[147]

1.1 Forestry Stewardship Council (FSC)

Since its formation in 1993, the FSC has emerged as one of the most well-documented sustainability certification programs, and is often cited as the industry leader. The creation of FSC is a private initiative that came about as a response of various NGOs, including WWF to the reluctance of the International Tropical Timber Organization to adopt sustainable certification and labelling standards. Stakeholders involved in the creation of FSC also included timber industry representatives, indigenous people's as well as forest workers' groups.

The FSC adopts global criteria that include 10 principles and 56 criteria, all of which relate to sustainable forestry management. These include land use rights, protection of high-conservation value forests, and the use of forest products and services. The FSC allows takes into account differing conditions in countries or states by approving national and local certification schemes in cases where global standards are inadequate for the domestic needs, provided they are in accordance with the general principles of the FSC's global certification scheme. The challenge for schemes or organizations like FSC is bringing together the various interests of stakeholders, whose values often diverge or are opposing, as in the case, for example, of environmental NGOs vs. timber companies.

The FSC claims to certify a tangible share of certain forest products, however, its coverage is mainly in the United States and Europe (32 per cent and 52 per cent, respectively), with tropical forests in the developing countries covering much less (Ellis and Keane, 2008 quoted in Certifiably Sustainable?)

1.2 Programme for the Endorsement of Forest Certification (PEFC)

The PEFC is an international umbrella organization dedicated to promoting sustainable forestry management through independent third-party certification. PEFC claims to be the world's largest forest certification system, endorsing more than 30 national certification systems covering over 240 million hectares of certified forests. PEFC developed International Sustainability Benchmarks, a set of 300 criteria that form the basis against which national certification systems are assessed. All criteria must be fulfilled by national systems. The criteria cover the following aspects: biodiversity,

[147] *Certifiably Sustainable?*

ecosystem services, natural alternatives to chemicals, workers' rights, local employment, indigenous peoples' rights, and legal framework.[148]

In contrast to FSC, PEFC is not involved in the development of international forestry principles. It relies on intergovernmental principles that have been developed and adapted in various regions.

A comparative study in 2012 which analyzed the efficiency and ability of the PEFC system to guarantee assurance for the exclusion of controversial wood (wood coming from unacceptable sources, e.g. illegally harvested, wood harvested in violation of traditional and civil rights) from PEFC certified products, as compared with the assurance system of the Forestry Stewardship Council, showed that despite the many similarities between the two systems, the PEFC system was found to be significantly weaker in several important areas. These areas are: traditional and civil rights and forest conversion, definition of unacceptable sources , requirements for risk assessment and transparency, data and field verification requirements, and monitoring and evaluation.[149]

2. FAIRTRADE CERTIFICATION

Fairtrade certification attempts to create global trade relationships that are socially and environmentally just (Jaffe 2007, quoted by Certifiably Sustainable?). Labelling is used by the Fairtrade system to certify products that were sustainably produced and traded. Products that currently use the Fairtrade label include coffee, tea, herbs, cocoa and chocolate, fresh fruit, flowers, rice, sugar, and vanilla. The globalized nature of agricultural production has resulted in supply chains that run across many different geographic regions. Stakeholders along this global supply chain include small farmers, manufacturers, importers, retailers, advocacy groups, among others. Fairtrade believes it supports long-term sustainability by fostering sustainable relationships between producers and consumers. They offer small farmers from developing countries a degree of security by keeping commodity prices at a manageable level, thus protecting them from price fluctuations, as a way of encouraging these farmers to engage in sustainable farming practices.

The Fairtrade certification movement began with the Max Havelaar label, certifying Fairtrade standards for Mexican coffee growers in the late 1980s. Fairtrade initiatives operate as members of the Fairtrade Labelling Organizations (FLO) International. FLO-CERT is the certification body for Fairtrade.

The Fairtrade standard aims to secure fair-trade for producers, especially those from developing countries. Principles for product standards include a set of environmental, socio-economic, social and labour principles. Principles for trade standards include minimum price requirements and traceability. The Fairtrade standard is applicable for a variety of products, from agriculture (e.g. coffee, cotton) to composite products.[150]

An extensive review of literature on the impact of fair-trade conducted in 2009 (coffee having received the most focus) found strong evidence that Fairtrade provides smallholder farmers with economic opportunities when these farmers are part of farmer organizations and have the capacity to supply products according to market specifications. Higher returns and stable incomes are enjoyed by many Fairtrade producers; though Fairtrade does not guarantee higher net household

[148] *http://www.pefc.org/about-pefc/who-we-are*
[149] *NEPCon (2012)*
[150] *http://www.fairtrade.net/about-us.html*

incomes because of other factors (e.g. other household costs). The literature also found other benefits from adopting Fairtrade that are non-quantifiable such as better access to credit, improved organizational capacity, among others. The findings suggest that Fairtrade is important in providing farmers greater stability and security to plan and invest for the longer term, and building their capacity.[151] From the point of view of consumers, the findings of a 2011 study based on consumer behaviour from experiments conducted in a US major retail chain suggest that there the Fairtrade label enjoys substantial support from customers although a segment of price-sensitive consumers are not willing to pay a large premium for the label.[152]

3. ISO 14000 SERIES

The International Organization for Standardization (ISO) 14000 series is a set of environmental management standards that can be used by organizations or firms to design and implement an effective environmental management system. Compared with other certification programs, it is not a market-driven tool as firms can determine their own performance baselines, and implementing an environmental management system aimed at reducing their environmental footprint. An accreditation body conducts an external audit, after which a certificate is awarded for compliance. The technical committee responsible for ISO 14000, ISO/TC 207 was established in 1993 to respond to the complex challenge of "sustainable development" raised during the 1992 UN Conference on Environment and Development in Rio de Janeiro.

Steps have been taken to ensure compatibility of the ISO 14001 with ISO 9001 standards, belonging to the family of quality management standards in the areas of management systems and auditing. This compatibility facilitates ease of use by organizations that wish to environmental and quality management systems the firm, the customers, and stakeholders. A common standard, ISO 19011 provide guidelines for auditing environmental and/or quality management systems. Ongoing work of the ISO/TC 207 also includes environmental performance evaluation, environmental labelling, life cycle assessment, environmental aspects in product standards, greenhouse gas management, among others. New standards are also being developed for eco-efficiency assessment, calculation of carbon footprint, ecodesign, and a few more aspects, in order to address evolving issues in environmental and sustainable development.[153]

3.1 Supermarket and retailers eco-friendly labels

Risks of contamination and other incidents have led many retailers to adopt a proactive stance in addressing supply chain risks and focus as well upstream by working closely with their suppliers.

Negotiated agreements with companies and large-scale purchasers are the major determinants of the market share of certified sustainable products. An advantage in this is that this relatively long-term commitment from several large retailers can enable a certification program to scale rapidly. Some retailers have enough leverage to require its supply chain to "go green", as in the case of Wal-mart, and in this, certification becomes a tool to manage. Some retailers, like Whole Foods, have started to create their own sustainable products line. Most efforts in the corporate sector to green their supply chain or to adopt more sustainable practices in their operations have come about as part of their corporate social responsibility. These shifts are also evident in the way

[151] *Nelson and Pound (2009)*
[152] *Heinmueller et al. (2011)*
[153] *http://www.iso.org/iso/theiso14000family_2009.pdf*

companies now attempt to build sustainability into their product attributes. A company no longer has to market its “sustainable” product separately from the conventional one.

APPENDIX 4: GREATER MEKONG SUBREGION SELECTED EXPERIENCE ON SUSTAINABILITY CERTIFICATION

1. LAO PDR

The development of organic production in Laos began in 204 through the initiative of Helvetas, a Swiss NGO, through the PROFIL project which was implemented in collabouration with the Ministry of Agriculture and Forestry's (MAF) Department of Agriculture. Four (4) major components of the project were essential to ensure the creation of a vibrant organic sector widely supported by farmers and stakeholders:[154]

1. Setting the proper regulatory environment and enabling frame conditions through the development of the Lao Organic Standards and the setting up of a certification system in 2005. The creation of the Lao Certification Body in 2008 to implement this system is a major outcome of the project.
2. Supporting producers in the production phase through the provision of trainings and technical assistance to farmer groups in several districts.
3. The creation of the organic farmers market in Vientiane in late 2006. Through this twice weekly market, a wide range of fruits, vegetables, and processed organic products are easily available to the public. The number of buyers has been observed to be increasing because of better awareness. The fact that the price of the produce is comparable to conventionally produced ones in the normal markets has also helped increase the popularity of the organic farmers market.
4. The gradual development of regional and international markets. Building contacts with prospective international buyers was essential. The success of certified organic coffee for exports serves as an example for other types of products that Laos has the potential to export.

The PROFIL project ended in 2008 but the success of this initiative has been sustained through the integration of the Lao Certification Body into the structure of the MAF's Department of Agriculture, and continuing support to farmers groups sector through its regular operations. District offices of the Department of Agriculture such as Vientiane Capital continue to provide technical support to these groups. Lao Certification Body provides support and training to farmer groups wishing to implement an Internal Control System, and grants certification to those which have fulfilled the requirements and passed inspection. The experience of Laos in the area of organic agriculture serves as an example to other small countries wishing to pursue a similar path.

2. VIET NAM

2.1 Safe vegetables

Viet Nam's Ministry of Agriculture and Rural Development (MARD) estimate that around 70,000 hectares of agricultural land are planted to 'safe' vegetables in Viet Nam, or about 12 percent of total agricultural land, producing an equivalent of 900,000 tonnes. An aggressive policy has been in place since 2005, mainly targeted toward vegetables for domestic consumption. Demand has been observed to be rising, which is driving larger scale production. About two-thirds of provinces – 40 out of 63, but increasing – are now developing safe vegetable programs. The following gives an

[154] *http://www.laosorganic.com/*

idea of the resources that are being set aside at the provincial level: Hanoi to spend 400 billion dong (2008–2015), Ho Chi Minh City to spend 200 billion dong (2007–2012), Hai Phong City to spend 100 billion dong (2008–2012). Other provinces have followed suit and submitted budgets for safe vegetable production.

Government policies supporting safe vegetables include development of new varieties, implementation of good agricultural practices (GAP), provision of storage facilities, setting the regulatory framework, implementing management systems such as ISO and Hazard Analysis and Critical Control Point (HACCP). The regulatory framework for safe vegetables includes the National Action Plan for Food Safety and Hygiene, various ordinances and decisions. In terms of guidelines and criteria, national standards have been adopted for specific vegetables such as cabbage, cucumber, tomato, French bean, Chinese pea, and corn. Technical guidelines are also in place for provincial standards.

Viet Nam good agricultural practices (VietGAP) standards serve as the main framework for the production of safe fresh fruit and vegetables. The standards are voluntary, and encourage producers to improve quality. The VietGAP framework involves selection of areas and varieties, management of the land, use of chemical inputs and water resources, postharvest and handling, waste management and treatment, labour conditions, checks and documentation, as well as appeals.

Safe vegetables are sold domestically in supermarkets and safe vegetable shops, as well as being sold to institutional buyers. There is also some export of safe vegetables and fruits, the main market of which is the United States. The Hanoi Safe Vegetables and Food Exchange, through the initiative of the Hanoi Department of Agriculture and Rural Development, was established to promote the effective production and distribution of safe vegetables, fruit, rice, meat, dairy products, and fish in Hanoi and the rest of the country. Among its aims are to establish a distribution network of consumer groups to promote direct sale from the farmers to these groups, provide market information to producers and support necessary production system adjustment, and link agricultural cooperatives and farms with potential business partners and investors.

The weaknesses in implementation have been identified to include difficulty in monitoring small farmers, certification systems not seen to be strong enough, and limited awareness of both producers and consumers. The government has outlined the following solutions: planned production areas, completion of technical guidelines, strengthening of the certification system, among others.[155]

In February 2013, MARD announced the application of VietGAP more broadly in fruit cultivation, with a target of 20 percent certified safe fruits in the market by 2020. VietGAP certified produce can carry the label VietGAP Green Label. As of this date, 12 vegetable and fruit production and distribution chain operators have been certified and authorized to use the VietGAP Green Label.[156]

2.2 ADDA Organic Project

Implemented by the Agricultural Development Denmark Asia (ADDA) between 2004 and 2012, the Organic Project in partnership with the Viet Namese Farmers Union (VNFU) aimed at developing a

[155] *http://www.unido.org/fileadmin/user_media/News/2008/Hang-Viet_Nam_Presentation.pdf*
[156] *http://vccinews.com/news_detail.asp?news_id=28003*

framework for the production and marketing of organic agriculture in Viet Nam. Organic farming based on international standards is a recent development in Viet Nam. Small organic initiatives have shown that there is potential for the development of this sector, especially targeted toward the domestic market. Awareness of organic products is still very limited, and consumers are also faced with the difficulty of distinguishing between organic and safe or “clean” products. The project aimed at supporting development of national organic standards as well as the creation of an independent certification organization.

The project’s primary target group was 1,300 small farmers in Hanoi and nearby areas, supplying markets in Hanoi and Hai Phong. It also promoted the organization of producers into groups, cooperatives and associations. The conduct of field trials was an important element of the project. Two components were also considered significant: the optimization of production systems, and research in basic production.

The Viet Nam Participatory Guarantee System (PGS) was developed by ADDA under this project in 2008. The system involves a wide range of stakeholders, from producers to consumers, to NGOs and traders. The PGS developed its own standard which was based on the National Basic Standards for Organic Producers in Viet Nam, developed by MARD. Under this system, producers are organized into producer groups and operate an inspection system or regular peer review. Producer groups are organized at the higher level in what is called inter-groups. Various stakeholders are represented in the inter-group, such as consumers, traders, local officials, farmer trainers, and NGOs working in the area. The group is responsible for certification decisions. The PGS coordination group is the overall committee that represents all the inter-groups. It is at this level that the PGS standard and procedures, and the PGS label are maintained and decided. The PGS certification is also issued by the coordination group. It is also responsible for the general promotion of PGS to the public. Currently, mostly vegetable products are certified.

APPENDIX 5: HARMONIZATION AND REGULATORY CONVERGENCE: PROCESSES AND PROGRESS

1. HARMONIZATION AND REGULATORY CONVERGENCE

Recommended approaches for a harmonized system to guarantee sustainability of bioenergy include protocols, guides and codes of good practice. These are mechanisms that have been developed by some international organization for the harmonization of procedures of certification bodies. ISO has developed Codes of Practices setting the minimum requirements for inspectors and certification bodies, e.g. Guide 59 (Code of Good Practice for Standardization). The ISEAL Alliance, which is the global membership association for sustainability standards, has developed Codes of Practice for credible social and environmental certification systems which ISEAL members are required to fulfill. In April 2013, ISEAL completed the second round of consultations for a new standard being developed called ISEAL Credibility Principles. The new set of principles will set out the values upon which credible standards are built, and upon which the Codes of Practice are based.[157] Well-defined and harmonized procedures in areas such as monitoring and conformity assessment are necessary in order to assure the controllability, and thus, the reliability of standards. This further helps in building credibility of certification schemes in the market.

In terms of actual experience, the distinct advantages of harmonizing in particular areas have been highlighted by a 2010 review of the implementation of the low carbon fuel standard. They include: lower risk of feedstock and fuel shuffling; possibility of credits generated in one program to be used in another program; ease of reporting on the part of parties being regulated; and uniformity in the methodology used to evaluate GHG impacts of transportation fuels.[158]

The lower costs for both export producers and consumers in the importing country have also been used as argument in support of harmonization. This has been more widely studied in the area of organic products. Tables 1 and 2 below show a comparison of costs incurred when there is harmonization compared with situations when there is none, for export producers and importing countries, respectively.

Table 1: Certification costs of harmonization (in USD/farm)

	EU		US		Japan		Switzerland	
Exporter	With	W/out	With	W/out	With	W/out	With	W/out
Argentina	400	400	400	950	400	3,400	400	400
Australia	245	245	245	545	245	545	245	245
Canada	447	557	447	447	447	1,840	447	557
Slovakia	660	660	660	1,085	660	1,510	660	660
US	802	882	802	802	802	2,207	802	882

Source: Adapted from Wynen (2004)

[157] *http://www.isealalliance.org/our-work/defining-credibility/codes-of-good-practice*
[158] *LCFS (2011)*

Table 2: Certification costs without harmonization (as percentage of import cost)

Exporter	EU	US	Japan	Switzerland	Rest of the world
Argentina	0.6	2.7	9.7	1.1	3.5
Australia	0.3	1.3	1.3	0.6	0.9
Canada	1.3	0.6	4.3	1.3	1.9
Slovakia	2.3	3.9	5.4	2.3	3.5
US	2.0	0.9	4.9	2.0	2.4

Source: Adapted from Wynen (2004)

2. REGIONAL HARMONIZATION INITIATIVES

2.1 Eco-Mark Africa (EMA)

Eco-Mark Africa was developed to create an enabling environment to improve market access and trade of African products at the same time fostering sustainable consumption and production patterns across the African continent. The development of a continent-wide and cross-sectoral label is part of the African 10-Year Framework Program on Sustainable Consumption and Production implementing the Johannesburg Plan of Implementation endorsed during the World Summit on Sustainable Development in 2002. The African Ecolabelling Mechanism (AEM) is the pan-African political structure and technical framework that implements and awards the Eco-Mark Africa label on the basis of a clear set of sustainability criteria.

The EMA will establish a certifiable sustainability standard as well as a recognition system for other sustainability standards that will also function as a quality assurance system. Currently, threshold criteria for environmental, social, and economic aspects are being defined and covering four sectors: agriculture, forestry, fisheries, and tourism. Criteria and indicators will be designed in a way that existing standard systems may be benchmarked against it and accredited certifiers may use it to certify companies. Incentives and supporting tools to prepare small producers for the certification process are being developed.

The EMA label is not intended to be a stand-alone label; it will work as an additional or “add-on” label that can be used for marketing purposes and public relations of companies that sell products or services which are certified by EMA, or a standard recognized by EMA. The EMA Standard is currently under development through a multi-stakeholder process.[159]

2.2 Single market for green products initiative (EU)

There is a current proposal to introduce a EU-wide standard to measure the environmental performance of products and organizations. The European Commission is scheduled to begin in 2013 a three-year pilot to test the common standard, which is intended to help companies reduce costs and lessen consumer confusion with too many labels on the market. The voluntary standard will include two methods to measure environmental performance throughout the life cycle: the Product Environmental Footprint (PEF) and the Organization Environmental Footprint (OEF). It is hoped that a progressive use of these methods would reduce the need for third-country exporters to comply with multiple requirements existing in the different domestic markets of the EU

[159] *http://www.ecomarkafrica.com/*

representing any number of private or public schemes, thus reducing costs for the company interested to sell across the Single Market.

The decision to propose an EU-wide ecolabel came about from a 2012 study by the International Institute for Management Development of the Ecole Polytechnique de Lausanne that surveyed consumers and consumers alike, concluded ecolabelling has nearly reached a saturation point and there is now an increasing concern about the practice's over-proliferation and credibility.[160]

2.3 East African Organic Products Standard (EAOPS)

The EAOPS is recognized in Burundi, Kenya, Rwanda, Tanzania, and Uganda. The EAOPS was developed through a regional public-private sector working group that consisted of representatives of national bureaus of standards, the national organic movements, the organic certifying bodies of the abovementioned countries, and the East African Business Council. The standard is based on organic standards currently in place in the region, the IFOAM Basic Standards and the Codex Alimentarius guidelines for production, processing, labelling, and marketing of organically produced foods.

The East African Organic Mark can be used by all certified to the EAOPS standard, both in third-party certification systems and PGS systems. Products certified to other recognized standards imported to East African countries can also carry the East African Organic Mark.[161]

The development of the EAOPS

The work on the East African Organic Production Standard was conducted in a strong public-private partnership, with the involvement and support from UNEP, UNCTAD, and IFOAM.

Drafting and consultations. The first draft was based on local and international organic standards, which was then further developed through a comprehensive consultation process. Two national consultations were organized in each participating country. Two regional meetings were then conducted for region-wide consultations with stakeholders. Individual meetings were held with the ministries off agriculture, the national bureaus of standards, and the East African Community. The draft standard was sent out to a mailing list of 800 individuals. The national organic movements in each country distributed the draft to even more stakeholders.

Piloting of the standard and international comparisons. The EAOPS was tested in the field by a group of organic inspectors in Uganda. They concluded that the standards worked well but had areas which needed improvement. A few items in the criteria were also recommended to be removed. The EAOPS was also compared with the IFOAM Basic Standards and the Codex Alimentarius organic guidelines. Most of the EAOPS was determined to be in full compliance with these standards. For some issues, the degree of compliance was a question of interpretation. A few items (e.g. conversion period) do not conform to those two standards.

[160] *http://www.environmentalleader.com/2013/04/11/eu-wide-eco-label-proposed/ and http://ec.europa.eu/environment/eussd/smgp/index.htm*
[161] *http://www.goma-organic.org/hamonization-tracker/the-east-african-organic-products-standard/*

Final adoption. The EAOPS was adopted by the East African Community (EAC) in 2007. Through the adoption by the EAC, it automatically became the official standard for the partner states, and existing national standards have been withdrawn.

2.4 Pacific Organic Standard

The Pacific Organic Standard was written for organic production in the Pacific Island countries and territories, endorsed by the Conference of Pacific Ministers of Agriculture and Fisheries. The Standard takes into account local agricultural traditions as well as two global organic standards, IFOAM and Codex Alimentarius. The scope covers crop production, animal husbandry, aquaculture production, processing and handling, social justice, and textile processing. The Standard is voluntary and can be used for self-assessment by producers, declarations of conformity in the marketplace, certification by certification bodies in the region and participatory guarantee systems. The Standard has standpoints which can be used for international negotiations, and can be a basis for equivalence agreements with other countries and regions.

The Pacific Organic and Ethical Trade Community (POETCom) name and label can be used by certified operators on their products. PGS systems can use a special PGS version of the POETCom label. The labels can be used on certified and in-conversion products.

Preparatory activities and development of the standard. The process to draft the Pacific Organic Standard began in 2007 through the initiative of the International Fund for Agricultural Development (IFAD). The project was implemented by IFOAM, in collabouration with the Secretariat of the Pacific Community, and the Regional Organic Task Force (ROTF). The ROTF is a public-private sector partnership with representatives from the national organic movements, government bodies, organic businesses, and regional NGOs.

In 2006, prior to the drafting, network building activities were intensively undertaken across the region. These activities were meant to identify and to sensitize the stakeholders on the importance of having such a standard. Awareness-raising and information dissemination activities were widely undertaken, as well as developing tools for understanding the main technical aspects of the standard.

Adopting of the standard and implementation. The first draft standard developed by the ROTF was circulated for consultation in January 2008. Several more drafts were developed, the final version of which was completed in June 2008. The First Pacific Organic Standard was launched in September of the same year by the Chair of the Pacific High Level Organics Group and Prime Minister of Samoa during the Ministers' of Agriculture and Forestry meeting in Apia Samoa. Further discussions were held with a range of stakeholders on the future of the organic sector in the region, e.g. the administration of the standard, updating, certification.

The ROTF evolved into the Pacific Organic and Ethical Trade Community (POETC) tasked with the implementation of the Regional Action Plan and serve as the overall body for organic and fair-trade movements in the region. The POETC is housed in the Secretariat of the Pacific Community and is now in the process of defining its governance structure.[162]

[162] *http://www.goma-organic.org/hamonization-tracker/the-pacific-organic-standard/*

2.5 Asia Regional Organic Standard (AROS)

The AROS was initiated under the auspices of the Global Organic Market Access (GOMA) Project. The GOMA Project is an initiative that follows on from the 2003–2008 work of the International Task Force on Harmonization and Equivalence in Organic Agriculture, and was jointly led by FAO, IFOAM, and UNCTAD.

The AROS was initiated in 2010 by the GOMA Asia Working Group. Drafts of the standard were developed based on the Common Objectives of Organic Standards (COROS) and the IFOAM Basic Standards. The practices and inputs of the region were all taken into account in the specification of requirements, practice examples, and lists of farm input substances. The drafts were consulted in most countries within the scope of the Working Group. The final draft of the standard was approved in 2012.

AROS is aimed to be used for assessing equivalence among organic standards in the region, paving the way for the multilateral recognition of the region's organic standards and systems. AROS can be used for organic certification and regulation, and can potentially harmonize standards in the region. By being a reference, it allows standards setting bodies in the public and private sectors to evaluate where their standards can be improved upon or updated to be consistent with other standards that have adopted AROS. It also serves as reference for the development of new, harmonized standards in countries where they do not exist. The scope of AROS covers plant production, collection of wild products, and the processing and labelling of products derived from these activities.

AROS was developed with participation from East, Southeast, and South Asian countries. The next steps include proposing the adoption of AROS by regional government bodies like the Association of Southeast Asian Nations (ASEAN) and the South Asian Association for Regional Cooperation (SAARC) as the harmonized regional organic standard. The proposal process has been initiated in ASEAN. Once it is adopted in ASEAN, it means that each country would be requested to adopt AROS or benchmark their standards to AROS, thus promoting harmonization in ASEAN. Such a process has its precedent in ASEAN when it was done for the GAP standards.[163]

2.6 ASEAN good agricultural practices (GAP)

The GAP for production of fresh fruits and vegetables in the ASEAN region is aimed at preventing or minimizing the risks of hazards during the production, harvesting, and postharvest handling of these produce. ASEAN GAP covers the following hazards: food safety, environmental impact, worker health, safety and welfare, and produce quality.

ASEAN GAP is aimed at enhancing the harmonization of GAP programs within the ASEAN region, thus facilitating trade between countries in ASEAN and to the global markets. It also aims at improving viability for farmers and ensuring a safe food supply. Not all fresh fruits and vegetable produce are covered by ASEAN GAP, as it excludes products that pose a high food safety risk, e.g. sprouts. ASEAN GAP can be used for all types of production systems, but is not a standard for organic products or GMO-free organics.

[163] *http://www.goma-organic.org/regional-projects/asia/*

Development of GAP. The development of ASEAN GAP standards began as a project between ASEAN and the Australian Government, in a project called Quality Assurance Systems for ASEAN Fruit and Vegetables Project under the ASEAN Australia Development Cooperation Program. A series of workshops were held involving representatives from ASEAN member countries which drew experiences with implementing GAP programs in Malaysia, Thailand, Singapore, and the Philippines. Certified systems and guidelines for GAP in other countries were also reviewed. The standard was drafted and refined in subsequent workshops to ensure compatibility with existing GAP programs, and ensure relevance and achievability for all member countries.[164]

2.7 Harmonizing Biofuel Standards in East Asia

Countries of the East Asia Summit (EAS) Region have been actively developing biodiesel fuel (BDF) for a variety of reasons. Out of 16 countries, 11 have established national standards to minimize problems with engines arising from the use of BDF. Only Brunei, Cambodia, Laos, Myanmar, and Singapore are the exceptions. The multiplicity of standards in the region, however, have raised barriers to BDF trade and is counterproductive to regional interests in maximizing benefits from BDF production and utilization. EAS policymakers have thus, decided to embark on harmonization of BDF, and so far a regional benchmark standard has been established. The need for East Asia to establish its own benchmark was found necessary as well because the main feedstocks in the region are different from those associated with other major benchmarks elsewhere in the world (e.g. coconut and palm oil).

The process of harmonization of BDF standards started with the Cebu Declaration on East Asian Energy Security in 2007, and was undertaken by the EAS Energy Cooperation Task Force. A Working Group at the ERIA was later established.

As only two international standards – that of the US and EU – were used as reference or basis in the process of developing the national standards by a large number of the EAS countries, the roadmap toward harmonization seemed to be clear. A comparative review done by the Economic Research Institute for ASEAN and East Asia (ERIA) shows that harmonization is technically feasible and beneficial economically and environmentally, but efforts stalled due to lack of political determination. At the East Asian regional level, no plan toward harmonization has been discussed. A way through is suggested through the adoption of a sub-optimal option instead of full harmonization of BDF standards by setting the benchmark as an optional standard in some countries, thus compliance is voluntary. Countries can opt to prioritize parameters in the BDF standard allowing them to harmonize first with indispensable standards, and then moving on to the less critical ones. Efforts to harmonize BDF standards require technical facility for monitoring quality, and by national policies that promote the broader usage of BDF.

In terms of similar experience in other regions, the EAS harmonization is more significant in what it has achieved so far (except EU experience, which is more akin to national, rather than regional action). In Asia, the only other regional effort is the Asia-Pacific Economic Cooperation's initiative to establish guidelines for the development of biodiesel standards (Shi and Goto 2011).

[164] *http://www.aadcp2.org/home/project.php?id=22*

2.8 Certification Alliance (CertAll)

CertAll is a one-stop service network for organic producers looking for local and international certification for organic products. CertAll allows organic organizations in smaller markets to have access to a wide range of organic certification and marketing support through its partner organizations (e.g. promotion at major market fairs, promotional listing in publications). CertAll provides access to internationally accredited inspection and certification service. The Alliance has members across Asia in the following countries: China, Thailand, Indonesia, Malaysia, Philippines, Laos, Viet Nam, Nepal, and Sri Lanka. The Italian certification body, Istituto per la Certificazione Etica e Ambientale, is also a member of the Alliance.

The Alliance focuses on the inspection and certification of organic production and processing, though it looks to expand to other areas, such as on ecotourism and GlobalGAP.

APPENDIX 6: REFERENCES

Akerlof, G. A. (1970) The market for lemons: Quality uncertainty and the market mechanism. The Quarterly Journal of Economics 84(3), 488–500.

Appleton, A. E. (2009) Private climate change standards and labelling schemes under the WTO agreement on technical barriers to trade. In International Trade Regulation and the Mitigation of Climate Change, eds. Thomas Cottier, Olga Nartova, and Sadeq Bigdeli. New York: Cambridge University Press, pp.131–51.

Baracol-Pinhão, D. (2011) The environmental area initiative approach to the WTO negotiations on environmental goods and services: Linking trade policy and climate change. NCCR Trade Regulation Working Paper No. 2011/017. World Trade Institute, Bern.

Bernstein, S. and Hannah, E. (2008) Non-state global standard setting and the WTO: Legitimacy and the need for regulatory space. Journal of International Economic Law 11(3), 575–608, DOI: 10.1093/jiel/jgn022

Biomass Technology Group. (2008) Sustainability Criteria and Certification Systems for Biomass Production. Final Report prepared for the European Commission (DG TREN). Enschede, the Netherlands.

California Environmental Associates (2011) A literature and state-of-knowledge review of fisheries certification and standards. In Toward Sustainability: The Roles and Limitations of Certification, Steering Committee of the State-of-Knowledge Assessment of Standards and Certification. (2012). Washington, DC: RESOLVE, Inc

Cashore, B. and Auld, G. (2011) Forestry Review. In Toward Sustainability: The Roles and Limitations of Certification, Steering Committee of the State-of-Knowledge Assessment of Standards and Certification. (2012). Washington, DC: RESOLVE, Inc.

Caswell, J. A. and Siny, J. (2008) Consumer demand for quality: Major determinant for agricultural and food trade in the future? Journal of International Agricultural Trade and Development 4(1) 99–116.

NEPCon. (2012) Comparative Analysis of the PEFC System with the FSCTM Controlled Wood Requirements. Study prepared by NEPCon for FSC International.

Dehue, B., Meyer, S., and Hamelinck, C. (2007) Towards a Harmonized Sustainable Biomass Certification Scheme. Study commissioned by the WWF International.

DiMatteo, K. (2008) Overview of group certification. In Harmonization and Equivalence in Organic Agriculture vol. 5, UNCTAD, FAO, IFOAM.

Ecofys. (2012) Analysis of Member State RED Implementation. Final Report for the European Commission. Retrieved from http://ec.europa.eu/energy/renewables/studies/doc/2013_task2_red_implementation.pdf

Endres, J. M. (2010) Clearing the air: The meta-standard approach to ensuring biofuels environmental and social sustainability, Virginia Environmental Law Journal 28(73).

Elbehri, A., Segerstedt, A., and Liu, P. (2013) Biofuels and the Sustainability Challenge: A Global Assessment of Sustainability Issues, Trends, and Policies for Biofuels and Related Feedstocks. Rome: FAO.

FAO (2010) Global Forest Resources Assessment 2010. FAO Forestry Paper 163, Rome. Retrieved from http://www.fao.org/docrep/013/i1757e/i1757e.pdf.

FAO (2013) A Report by the High Level Panel of Experts on Food Security and Nutrition. Retrieved from http://www.fao.org/fileadmin/user_upload/hlpe/hlpe_documents/HLPE_Reports/HLPE-Report-5_Biofuels_and_food_security.pdf

Fernholm, J. (2006) Consuming ethical codes of conduct? European Advances in Consumer Research, 7, 614-5. Retrieved from http://www.acrwebsite.org/volumes/eacr/vol7/EuropeanVolume7_80.pdf.

Gascoine, D. (2007) Private voluntary standards within the WTO multilateral framework. Report prepared for the Department for International Development, London.

Giovannucci, D. and Ponte, S. (2005) Standards as a new form of social contract? Sustainability initiatives in the coffee industry. Food Policy, 30(3), 284–301. DOI:10.1016/j.foodpol.2005.05.007

Global Alliance for Clean Cookstoves. (2011) Igniting Change: A Strategy for Universal Adoption of Clean Cookstoves and Fuels. Retrieved from http://www.cleancookstoves.org/resources/fact-sheets/igniting-change.pdf

Gulbrandsen, L. H. (2009) The emergence and effectiveness of the Marine Stewardship Council. Marine Policy vol. 33(4), 654–60. DOI:10.1016/j.marpol.2009.01.002

Heinmueller, J., Hiscox, M., and Sequeira, S. (2011) Consumer Demand for the Fairtrade Label: Evidence from a Field Experiment. Retrieved from http://personal.lse.ac.uk/sequeira/SSRN-id1801942.pdf

International Energy Agency. (2012) Task 3: Impacts of Sustainability Certification on Bioenergy Markets and Trade. Strategic Inter-Task Study T40/43/38. Retrieved from http://142.150.176.36/task43/images/membersonly/certificationproject/Task%203%20Impact%20on%20trade%20071112c.pdf

International Trade Centre (ITC). (2011) The Impact of Private Standards on Global Value Chains. Literature Review Series on the Impacts of Private Standards – Part I. Geneva: International Trade Centre.

International Trade Centre (ITC). (2011) When do Private Standards Work. Literature Review Series on the Impacts of Private Standards – Part IV. Geneva: International Trade Center.

Lang, Barbara (2006) Experiences with voluntary standards initiatives and related multi-stakeholder dialogues. GTZ commissioned by the Federal Ministry for Economic Cooperation and Development. http://www2.gtz.de/dokumente/bib/06-0656.pdf

Lebel, L. (2012) Agricultural Standards and Certification Systems. In Toward Sustainability: The Roles and Limitations of Certification, Steering Committee of the State-of-Knowledge Assessment of Standards and Certification. (2012). Washington, DC: RESOLVE, Inc.

Lee, H., Clark, W. C., and Devereaux, C. (2008) Biofuels and sustainable development: Report of an executive session on the grand challenges of a sustainability transition. CID Working Paper No. 174, Joint Center for International Development and Belfer Center for Science and International Affairs. Cambridge, MA: Harvard University.

Lin, J. S. W. (2010) The sustainability of biofuels: Limits of the meta-standard approach. The Governance of Clean Development Working Paper 011, University of East Anglia. Retrieved from http://www.tyndall.ac.uk/sites/default/files/GCD_WorkingPaper011.pdf

Lin, J. (2012) Governing biofuels: A principal-agent analysis of the European Union biofuels certification regime and the Clean Development Mechanism. Journal of Environmental Law 24(1), 43-73. DOI 10.1093/jel/eqr025

Liu, Pascal (2009) Private standards in international trade: issues and opportunities. Paper presented at the Workshop on Environment-Related Private Standards, World Trade Organization 9 July 2009, Geneva.

Maertens, M. and Swinnern, J. F. M. (2006) Trade, standards, and poverty: Evidence from Senegal. LICOS Discussion Papers, No. 177/2006. Leuven: Katholieke Universiteit.

Matus, K. (2009) Standardization, Certification, and Labelling. A Background Paper for the Roundtable on Sustainability Workshop, January 19–21, 2009.

Milder, J. C., Gross, L. H., and Class, A. M. (2012). Assessing the ecological impacts of agricultural eco-certification and Standards: A global review of the science and practice. Internal Report. Washington, D.C.: Eco-Agriculture Partners.

National Research Council of the National Academies. (2010) Certifiably Sustainable? The Role of Third-Party Certification Systems: Report of a Workshop, Committee on Certification of Sustainable Products and Services. Washington, D.C.: The National Academies Press, http://www.ap.edu/catalog.php?record_id=12805

Nelson, V. and Pound, B. (2009) The Last Ten Years: A Comprehensive Review of the Literature on the Impact of Fair Trade, University of Greenwich, Natural Resources Institute. Retrieved from http://www.fairtrade.org.uk/includes/documents/cm_docs/2010/n/2_nri_full_literature_review_final_version.pdf

Paiano, A., Camaggio, G., and Lobefaro, L. (2011) Implications and Policies about the First Generation Biofuels: an International and EU Analysis. New Medit 3/2011. Retrieved from http://www.iamb.it/share/img_new_medit_articoli/393_56paiano.pdf

Scarlatt, N. and Dallemand, J. F. (2011) Recent developments of biofuels/bioenergy sustainability certification: A global overview. Energy Policy 39, pp. 1630–46. DOI:10.1016/j.enpol.2010.12.039

Shi, X. and Goto, S. (2011) Harmonizing Biofuel Standards in East Asia: Current Status, Challenges, and Way Forward. Discussion Paper ERIA-DP-2011-03, Economic Research Institute for ASEAN and East Asia.

Steering Committee of the State-of-Knowledge Assessment of Standards and Certification (2012) Toward Sustainability: The Roles and Limitations of Certification. Washington, D.C.: RESOLVE, Inc.

Swann, G. P. (2010) International standards and trade: A review of the empirical literature, OECD Trade Policy Working Papers, No. 97, OECD Publishing. DOI: 10.1787/5kmdbg9xktwg-en

Tallontire, A. and Greenhalgh, P. (2005) Establishing CSR drivers in agribusiness. Final report for Foreign Investment Advisory Service International Finance Corporation and World Bank. Natural Resources Institute, UK. Retrieved from http://www.eldis.org/vfile/upload/1/document/0708/DOC19592.pdf.

UNOPS (2009) A guide to environmental labels – for procurement practitioners of the United Nations system. Retrieved from http://www.greeningtheblue.org/sites/default/files/Env%20Labels%20Guide_final_0.pdf.

USDA Foreign Agricultural Service. (2012) EU Biofuels Annual 2012, GAIN Report Number 2020 (June). Retrieved from http://www.usda-france.fr/media/Biofuels%20Annual_The%20Hague_EU-27_6-25-2012.pdf

US Environmental Protection Agency. (2010) Renewable Fuel Standard Program (RFS2) Regulatory Impact Analysis. EPA-420-R-10-006. Retrieved from http://www.epa.gov/otaq/renewablefuels/420r10006.pdf

Valkila, J. (2009) Fair Trade organic coffee production in Nicaragua – sustainable development or a poverty trap? Ecological Economics 68(12), 3018-25. DOI:10.1016/j.ecolecon.2009.07.002

Van Dam, J., Junginger, M., and Faaij, A. P. C. (2010) From the global efforts on certification of bioenergy towards an integrated approach based on sustainable land use planning. Renewable and Sustainable Energy Reviews 14(9), 2445–72. DOI:10.1016/j.rser.2010.07.010

Vollmer, D. (2010) Surveying the landscape: Certification schemes for sustainable products and services. In Certifiably Sustainable? The Role of Third-Party Certification Systems, Committee on Certification of Sustainable Products and Services. Washington D.C.: The National Academies Press, pp. 105–18.

Wilson, J. S. (2008) Standards and developing country exports: A review of selected studies and suggestions for future research. Journal of International Agriculture Trade and Development 4(1), 35–45.

Wilson, J. and Otsuki, T. (2004) To spray or not to spray: Pesticides, banana exports, and food safety. Food Policy 29(2): 131–46. DOI:10.1016/j.foodpol.2004.02.003

Wynen, E. (2004) Impact of organic guarantee systems on production and trade in organic products. In Harmonization and Equivalence in Organic Agriculture vol. 1, UNCTAD/DITC/TED/2005/4

Zezza, A. (2013) Sustainability certification in the biofuel sector. Discussion paper #2013–03, Belfer Center for Science and International Affairs, Harvard Kennedy School. Cambridge, MA: Harvard University.