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UNDERSTANDING THE IMPACT OF CONSUMER-ORIENTED ASSURANCE SCHEMES

A REVIEW OF VOLUNTARY STANDARDS AND LABELS FOR THE ENVIRONMENTAL SUSTAINABILITY OF AGRI-FOOD PRODUCTS

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Understanding the Impact of Consumer-Oriented Assurance Schemes: A Review of Voluntary Standards and Labels for the Environmental Sustainability of Agri-Food Products

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Assurance schemes (certifications and labels) are widespread in the agri-food sector. This paper reviews the landscape of existing schemes, and the evidence on whether labels change consumer behaviour, and whether assurance schemes achieve positive change on the farm. The impact of existing labels on shopping behaviours appears limited: even for well-established schemes, market shares remain low, as factors such as taste, health, or price appear to dominate consumer decisions. Regarding farm-level effects, not all crops, standards, and geographies have been equally well studied, and many studies find no effect; but when an effect is found, it is usually positive. The paper identifies actions to improve the effectiveness and inclusiveness of existing and new assurance schemes, and also highlights the new trend of labels which communicate environmental impacts, rather than conformity with process or production requirements.

Key words: Food systems, Voluntary sustainability standards, Certification, Credence goods, Hypothetical bias

JEL codes: D91, Q50, M3, D12, L15

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Table of Contents

Tables

Figures

Boxes

Key messages

- Assurance schemes, in the sense of certifications and labels confirming that a product or farmer adheres to certain requirements, are widespread in the agri-food sector. These typically cover not only environmental requirements, but also social or ethical aspects. A small number of schemes such as organic standards, Fairtrade, and Rainforest Alliance are particularly important in terms of global coverage and have shown strong growth in recent years.
- While consumers often state that sustainability is important to them, in reality the impact of existing labels on shopping behaviours is limited. Even for well-established schemes such as organic standards, market shares remain low. Factors such as taste, health, or price are usually more important in consumer decisions.
- Regarding farm-level effects of sustainability standards on economic, social, and environmental dimensions, not all crops, standards, and geographies have been equally well studied. A significant share of available studies find no discernible impact. However, when an effect is found, it is usually positive.
- Several actions can improve the effectiveness and inclusiveness of existing and new assurance schemes. For example, governments can provide greater clarity on the meaning of different schemes (e.g. through public websites). Targeted interventions can also help reduce the costs of these schemes for resource-poor farmers (particularly in low-income countries) and SMEs.
- A new trend is the growth of labels which communicate environmental impacts, rather than conformity with process or production requirements. These could help consumers reduce the environmental impact of their food choices without necessarily increasing household expenditures, by encouraging a shift between product groups – something which is not possible with traditional assurance schemes based on voluntary sustainability standards. To provide the right signals to consumers, farmers, and other supply chain actors, environmental impact labels should ideally communicate actual impacts rather than product averages.

1. Introduction

Food systems account for a significant share of global environmental pressures, such as greenhouse gas (GHG) emissions, water pollution, and biodiversity loss (Poore and Nemecek, 2018; IPCC, 2019; IPBES, 2019; Crippa et al., 2021). Addressing these environmental pressures will require action not only by agricultural producers, but also by other supply chain actors, consumers, and policy makers (Poore and Nemecek, 2018).

To enable consumers to make more sustainable consumption choices, a diverse range of environmental labelling and information schemes (ELIS) have been created (Gruère, 2013). These differ in terms of scope (e.g. which products, which environmental attributes), whether they are voluntary or mandatory, whether they focus on product characteristics or on processes and production methods, how information is communicated and to which audience, and so on.

This paper focuses on a subset of these schemes: voluntary schemes which communicate to consumers through a product label that a food product conforms to certain requirements in terms of production practices, with the aim of improving environmental sustainability. In the agri-food sector, such schemes are often referred to as “assurance schemes”.

There are currently no globally accepted definitions for many of the terms used to describe these and related initiatives, and different terms are sometimes used in the literature. For this reason, it is useful to clarify upfront some of the definitions used in this paper.

In line with the definitions in the WTO Agreement on Technical Barriers to Trade, the term *standards* is often used to describe requirements which are not a legal obligation (when requirements are mandatory, the term "technical regulations" is often used instead) (Rousset et al., 2015).[1] Voluntary standards can be established by governments, private firms, NGOs, or multi-stakeholder initiatives. Some standards cover characteristics of a product itself (e.g. energy efficiency labels on appliances), while others cover the processes and production methods used (e.g. organic standards) (Gruère, 2013). In the academic literature, the term "voluntary sustainability standards" (VSS) is often used as shorthand for initiatives which define economic, environmental, and/or social sustainability requirements (Traldi, 2021).

A *conformity assessment* can then determine whether a product, process, entity, or site conforms to the relevant requirements. The term "assurance" is used in this context to describe "[d]emonstrable evidence that specified requirements relating to a product, process, system, person or body are fulfilled" (ISEAL, 2018). The assessment can be conducted by the entity itself (first-party), the buyer (second-party, e.g. when retailers assess their suppliers), or an independent body (third-party). Third-party conformity assessment is also referred to as *certification*.

In agri-food contexts, however, the term "assurance" is also often used as a synonym for third-party verified schemes. Examples include:

- The New Zealand Farm Assurance Program (https://www.nzfap.com/)
- The Irish Origin Green Quality and Sustainability Assurance schemes (https://www.origingreen.ie/what-is-origin-green/behind-the-programme/accreditation-and-verification/)
- The UK Red Tractor Food Assurance Scheme (https://redtractor.org.uk/)
- The Michigan Agriculture Environmental Assurance Program in the United States (https://maeap.org/),
- The Sustainable Farming Assurance Programme in Latin America (https://www.sustainableassurance.com/)

The term "assurance" is thus widely used to refer to third-party verified schemes in the agri-food sector, and will also be used here in this sense.

Labels and other information systems can be used to communicate claims about a product, including conformity with standards, to customers and other interested parties (Gruère, 2013). Well-known examples of schemes using labels based on voluntary sustainability standards are organic labels, Rainforest Alliance, or the Roundtable on Sustainable Palm Oil (RSPO). However, not all standards are necessarily accompanied by labels. Some standards could be intended mainly for communication between businesses (e.g. whether or not a farm meets criteria set by a retailer). Conversely, consumer-facing labels could also express the environmental *impact* of a product rather than its conformity with production or process requirements.

The assurance schemes covered in this report are those linked to *voluntary environmental sustainability standards* focusing on agri-food products (excluding seafood certification), focusing mostly on production and processing, and communicating to consumers through a product label. In addition, this report also briefly introduces newer initiatives which communicate environmental impacts to consumers (typically through labels, and typically on the basis of life-cycle assessments of environmental impacts).

This paper reviews the available evidence on how such assurance schemes can contribute to improving the environmental sustainability of food systems. Two important questions here are whether labels change

[1] Governments can (and often do) create public voluntary standards, such as on organic agriculture. These can be binding in the sense that producers must follow the standard to claim their product as organic. However, these standards are still voluntary in the sense that producers are not obliged to adopt organic agricultural practices.

consumer behaviour, and whether assurance schemes achieve positive change on the producer side. In turn, these lead to other questions, e.g. around the determinants of consumer trust.

Not all relevant aspects have been studied sufficiently in the scientific literature. Still, it is possible to derive some broad lessons from the available evidence. Despite their popularity, existing labels seem to have only modest effects on consumer behaviour; even well-known initiatives such as organic labels generally have low market shares. On the producer side, many studies find positive effects on economic, social, and environmental outcomes, although a considerable share of studies finds no effect; findings may thus be highly context dependent.

The next section provides a brief conceptual discussion on how assurance schemes and labels can overcome market failures due to asymmetric information problems for product attributes that are difficult to observe for consumers. Section 3 presents the landscape of voluntary sustainability standards for agri-food products. Section 4 discusses evidence on the effectiveness of labels in terms of consumer behaviour, while Section 5 discusses the effectiveness in terms of farm-level outcomes. Section 6 discusses possible synergies between different approaches (e.g. between public and private approaches, or between assurance schemes and due diligence approaches). Section 7 proposes actions which can improve effectiveness and inclusiveness of existing and proposed new schemes. Section 8 concludes.

2. Assurance schemes and labels as a tool for overcoming information problems in markets

Assurance schemes and labels have been developed as a solution to the problem of providing so-called "credence attributes" in the market.

When consumers are shopping for products, three types of product characteristics are involved (Darby and Karni, 1973). Some are *search* attributes, such as colour, which are easy for consumers to assess before purchasing. Markets generally function well in providing the search attributes consumers want. Some other product characteristics are *experience* attributes, such as taste, which the consumer cannot evaluate before purchasing but which become clear once the product is consumed. As long as producers can be identified (e.g. through brands and trademarks), markets generally still work well in providing these experience attributes, as consumers can rely on word of mouth or reputation (Shapiro, 1983).

However, the market mechanism faces obstacles in providing the third type of product characteristics: *credence* attributes which cannot be evaluated by the customer either before or after purchasing a good, such as environmental impacts of food products. For credence attributes, the market mechanism is vulnerable to asymmetric information problems, leading to market failure. If consumers are willing to pay a price premium for some credence attribute (e.g. low environmental impacts), suppliers could falsely claim their product has this attribute to reap the price premium. Consumers would then realise that suppliers may be making false claims, and would hence stop trusting all such claims. As a result, the premium would disappear for all sellers, including those who did in fact provide the desired attribute (Akerlof, 1970). The resulting lack of consumer trust would then prevent food chain actors from developing and marketing food products with new, desirable credence attributes (Macready et al., 2020).

Many countries have regulations against fraudulent claims by sellers to avoid these problems. Yet these regulations do not fully resolve the problem when terms such as "fair" or "sustainable" could reasonably be defined differently by different people (Rousset et al., 2015). Assurance schemes and labels are a possible solution to these information problems. By defining requirements (e.g. through voluntary sustainability standards), assessing conformity of producers, sites and/or products against those requirements, and then communicating this conformity to consumers (through labels), credible assurance schemes can overcome the asymmetric information problem (Rubik & Frankl, 2017; Roe et al., 2014). For example, many countries have voluntary public standards defining what constitutes "organic" production, and rules specifying what kind of label may be used to communicate to consumers that a product was organically produced (Rousset et al., 2015). Labels transform credence attributes into search attributes: the consumer can now look for the label when searching for the product's desired attributes (Rousset et al., 2015).

Traditional assurance schemes can create incentives for producers to adopt more sustainable practices if doing so allows them to join the scheme and enjoy a price premium, a greater or more stable market for

their products, or other benefits. However, a necessary condition for these incentive effects to exist is that there is consumer demand. If consumers are indifferent, there would be no possibility of offering incentives to producers.

Where consumers do have preferences for specific credence attributes, one positive effect of solving the information problem is that these consumers are now better matched to products which meet their preferences. In this case, assurance schemes may create economic value for consumers (who can enjoy products which better meet their preferences) and producers (who may be able to charge a price premium). However, they would not necessarily improve environmental sustainability of food systems, as they may simply "reshuffle" existing product flows. Assurance schemes and labels only improve environmental sustainability if they convince producers to change their practices, or change the mix of products consumed towards products with lower environmental impacts.

3. The landscape of assurance schemes for agri-food products

Hundreds of voluntary sustainability standards, assurance schemes, and other types of sustainability initiatives exist, many of which relate to agri-food products. However, evidence on market shares or adoption rates by farmers is only available for a handful of major schemes. The first part of this section provides a broad overview on the characteristics of initiatives using data from Standards Map, a detailed database maintained by the International Trade Center (ITC).[2] The second part of this section then discusses in more detail twelve major sustainability standards related to agriculture and food.

3.1. A broad overview

The ITC Standards Map database contains self-reported information on 262 distinct voluntary sustainability standards and assurance schemes, across sectors and geographies. The ITC Standards Map database is neither a comprehensive nor necessarily a representative sample of these initiatives; but given its wide coverage, it can still provide some insights into the characteristics of existing initiatives. Of the 262 initiatives in the database (as of 2019), nearly two-thirds (170) relate to agriculture and food (Table 1); within this sectoral scope, standards and schemes focusing on agriculture dominate in the database.

Table 1. Sectoral scope of standards and schemes in ITC Standards Map

Sectoral scope	Nr	%
All sectors	262	100%
Agri-food	170	65%
Agriculture	150	57%
Fish – Aquaculture	53	20%
Fish – Wild capture	41	16%
Livestock	54	21%
Processed food	71	27%

Note: A standard or scheme may cover more than one sector. "Agri-food" covers agriculture, fish – aquaculture, fish – wild capture, livestock, and processed food.
Source: ITC Standards Map database.

[2] See https://www.standardsmap.org/en/home (accessed 13 Sept 2022). The data used here is the 2019 vintage of the Standards Map database. A number of other databases contain information on standards and labelling schemes. The Ecolabel Index (www.ecolabelindex.com) covers 455 labels and standards across a range of sectors. An earlier information source is Gruère (2013), who reviewed 544 environmental labelling and information schemes covering 197 countries. Other data sources include the Global Ecolabelling Network (www.globalecolabelling.net) and the Sustainability Compass (*Kompass Nachhaltigkeit,* www.kompass-nachhaltigkeit.de), although the latter does not cover food and agriculture. These databases typically focus on requirements, ownership, the standard-setting process, and the type of verification used (e.g. third-party accredited), but rarely include data on market shares, number of certified producers, etc.

Table 2 shows that for the 170 agri-food related standards and schemes in the ITC Standards Map database, environmental, management, and social requirements are most common. Of the 170 agri-food related standards and schemes, 160 contain environmental requirements, making this the most "universal" category of requirements.

Table 2. Requirements covered by agri-food standards and schemes

Category	Number of standards and schemes with requirements	%
Environment	160	94%
Management	155	91%
Social	148	87%
Ethics	139	82%
Quality	125	74%
Total	170	100%

Note: Table summarises the number of distinct requirements as self-reported in the ITC Standards Map database for the 170 agri-food related standards and schemes. A requirement is included in the table if its "degree of obligation" in the ITC Standards Map database was not "NA" or "not covered".
Source: ITC Standards Map database.

Across the 170 standards and schemes, all five categories of requirements are relatively common; it is rare to have just a single focus (e.g. exclusively on environmental criteria). Table 3 shows that 94 of the 170 standards and schemes (55%) have criteria across all five categories (environment, social, quality, management, and ethics), with a further 47 (28%) covering four out of five categories. Only 4 standards or schemes (2%) focus on a single category.

Table 3. Number of categories of requirements covered by agri-food standards and schemes

Number of categories covered	Number	%
All five	94	55%
Four	47	28%
Three	15	9%
Two	10	6%
One	4	2%
Total	170	100%

Note: Table summarises how many categories of requirements (environment, social, quality, management, and ethics) are covered by the 170 agri-food related standards and schemes in the Standards Map database.
Source: ITC Standards Map database.

As noted above, 160 of the 170 agri-food standards and schemes that self-report on ITC Standards Map have environmental requirements. Table 4 shows that these are typically private standards, using third-party assessment by a body independent from the standard-setter, with requirements around the chain of custody or traceability. Moreover, the majority of the initiatives also use a label, although this is far from universal.

Table 4. Key characteristics of agri-food standards and schemes with environmental requirements

	Yes	%
Private standard?	133	83%
Third-party assessment?	121	76%
By an assessment body independent of the standard setter?	112	70%
Chain of custody/traceability?	103	64%
Label?	100	63%

Note: Data refers to the 160 agri-food standards in the ITC Standards Map database which claim to have environmental requirements of some nature. "Third party assessment" based on the variable "minimum level of conformity assessment allowed"; "assessment body independent of the standard setter" based on the variable "Certification/verification body has no affiliation with governance mechanism of standard-setting organization".
Source: ITC Standards Map database.

Table 5 shows at which stage of the life cycle the environmental requirements of the 160 agri-food standards apply, according to the self-reported information in ITC Standards Map. Two-thirds have requirements targeting the primary production stage, while 37% target the manufacturing stage. Other stages of the life cycle are much less commonly covered.

Table 5. Life cycle stage where environmental requirements apply

	Yes	%
Primary production	107	67%
Manufacturing	59	37%
Transportation/distribution	30	19%
Use and consumption	12	8%
End of life	6	4%

Note: Showing information for 160 agri-food standards with environmental requirements. One standard may apply to more than one life cycle stage.
Source: ITC Standards Map database.

Table 6 provides more detail on the types of environmental requirements included in the 160 agri-food standards and schemes with environmental requirements. The vast majority have requirements on inputs (91%), waste (88%), and water (87%). By contrast, requirements on climate/carbon aspects are only found in less than half of the standards and schemes.

In summary, the analysis of the ITC Standards Map database, which relies primarily on self-reporting by standards, suggests that agri-food related standards often cover several domains (e.g. environmental, social, and ethical aspects), and the vast majority contain environmental requirements, which typically focus on the agricultural production stage. These agri-food standards and schemes with environmental requirements are typically private standards using independent third-party assessment and traceability or chain of custody requirements. Most are accompanied by a label, but this is not universal.

Box 1 provides more details on the UK Red Tractor Food Assurance Scheme, which shares many of the characteristics discussed here, as a private standard using third-party certification on a wide range of requirements, and accompanied by a label.

Table 6. Environmental requirements for agri-food standards and schemes in ITC Standards Map

Criterion	Nr of standards and schemes with a requirement	%
Inputs	146	91%
Waste	141	88%
Water	139	87%
Biodiversity	131	82%
Soil	128	80%
Energy	104	65%
Forests	85	53%
Climate - Carbon	79	49%
Livestock	59	37%
All environmental req.	160	100%

Note: Table summarises the number of distinct environmental requirements as recorded in the ITC Standards Map database for the 160 agri-food related standards and schemes which have some type of environmental requirement. A requirement is included in the table if its "degree of obligation" in the ITC Standards Map database was not "NA" or "not covered".
Source: ITC Standards Map database.

Box 1. The Red Tractor Food Assurance Scheme

The Red Tractor Food Assurance Scheme (originally started in 2000 under the name "British Farm Standard") provides standards that result in a certification for poultry, dairy, beef and lamb, pork, cereals and sugar beet, and fruits and vegetables. The standards cover a wide range of requirements such as food safety and traceability, quality, general management practices, animal welfare standards, and environmental aspects. Certification is provided by independent third-party certification bodies and is process-based. One of the criteria for Red Tractor certification is that all steps of the production process must take place in the United Kingdom.

The Red Tractor Food Assurance Scheme is the most popular such scheme in the United Kingdom, with some 50 000 British farmers adhering to the standards, covering over 90% of UK poultry farms and 95% of UK milk production. The Red Tractor standard is used by all leading UK supermarkets.

Certified products can be labelled with a Red Tractor logo. Different logos exist depending on the Red Tractor ingredient's share of the final product. Where the certified ingredient is at least 95% of the product, a "Certified Standards" label is applied. Where an ingredient makes up less than 95% of the product, but all of the ingredient is Red Tractor certified (e.g. beef in a lasagne), a "Named Ingredient" label is applied (e.g. "Certified Beef"). For poultry products, additional "Free Range" and "Enhanced Welfare" labels exist as well. However, not all products made with Red Tractor certified ingredients are necessarily labelled as such.

While the Red Tractor scheme is a private standard, it is recognised by the UK Food Standards Agency's Earned Recognition programme, so that farmers who adhere to the scheme receive fewer inspections from authorities.

The Red Tractor scheme for fruits and vegetables, included in the ITC Standards Map database, is an example of a scheme covering all five categories (environment, social, quality, management, and ethics) (Table 7).

The Standards Map database distinguishes between those requirements which are deal-breakers (i.e. certification is impossible if the criterion is not met), those which are major, and those which are optional. For the fruits and vegetables scheme, most requirements relate to environmental and quality aspects; this is also true for the deal-breakers. There are also a number of criteria relating to labour practices

(e.g. around the safe use of hazardous pesticides). Not all Red Tractor standards include such social/labour requirements.

Table 7. Requirements in the Red Tractor scheme for fruits and vegetables

Category	Deal-breaker	Major	Optional	Total
Environment	**11**	**24**	**9**	**44**
Biodiversity		2	3	5
Energy		2		2
Inputs	6	9		15
Soil	2	2	4	8
Waste	1	3		4
Water	2	6	2	10
Social		**12**		**12**
Labour practices - conditions of work and social protection		12		12
Management	**2**	**7**		**9**
Supply Chain Responsibilities	1			1
Sustainability Management	1	7		8
Quality	**8**	**25**	**1**	**34**
Ethics	**3**			**3**
Total	**24**	**68**	**10**	**102**

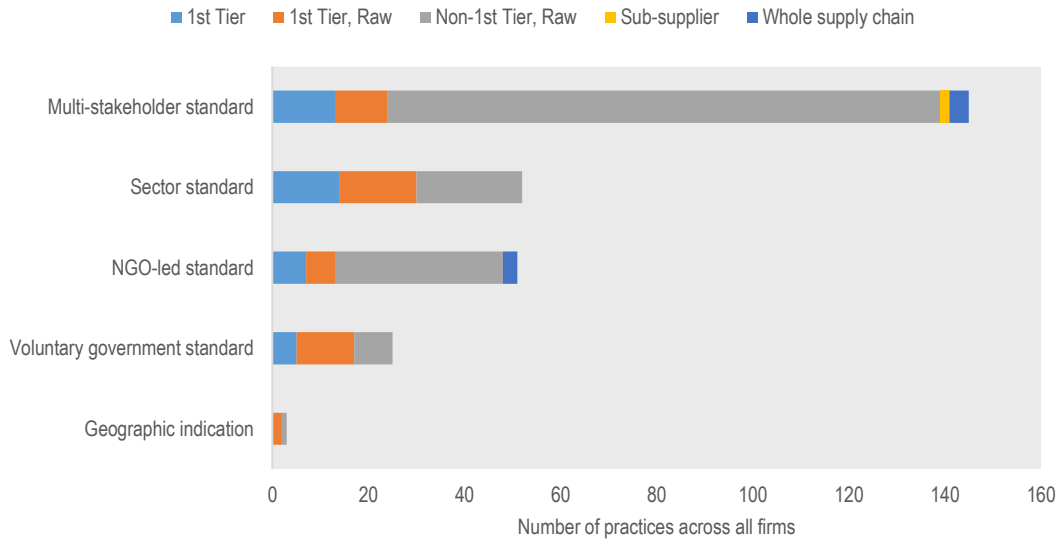
Note: Table shows the number of requirements of the Red Tractor fruits and vegetables scheme, as reported in ITC Standards Map (2019), by category and (where relevant) sub-category.
Source: ITC Standards Map.

Source: ITC Standards Map; Red Tractor Assurance (https://redtractor.org.uk/, accessed 30 September 2022).

Unfortunately, the Standards Map database usually does not provide information on how widespread the different standards are. However, other information sources can shed some light on this question. Thorlakson et al. (2018a) analysed the use of various voluntary practices (including sustainability standards and assurance schemes) by major companies in the food, textile, and wood-products sectors. Their analysis sheds some more light on the characteristics of widely used standards. First, where firms use standards, these are nearly exclusively related to single inputs (e.g. palm oil) rather than taking a more comprehensive view of firms' environmental impacts. Second, standards have only a limited reach in firms' supply chains (Figure 1). The vast majority of standards applies to direct suppliers and/or suppliers of raw materials (whether direct suppliers or sub-suppliers). Very few initiatives address other sub-suppliers or the entire supply chain. However, this pattern is not necessarily inefficient: firms may be focusing on specific raw material inputs as part of a targeted approach focusing on sustainability "hotspots". Third, multi-stakeholder standards (which are jointly developed by several actors, e.g. governments, NGOs, and businesses) appear to be most widely used.[3]

[3] A large literature explores the governance arrangements of voluntary standards; see Lambin and Thorlakson (2018) for a review. On possible interactions between public and private standards, see also earlier OECD work (Rousset et al., 2015).

Figure 1. Supply chain reach of standards



Note: Figure shows total number of practices across firms in the food, textile, and wood-products sectors surveyed by Thorlakson et al. (2018a). Firms can use multiple practices. "1st Tier" refers to direct suppliers of the firm except those supplying raw materials; "1st Tier Raw" refers to direct suppliers of raw materials. "Non-1st Tier, Raw" refers to sub-suppliers supplying raw materials.
Source: Adapted from Thorlakson et al. (2018a).

More detailed information on the use of standards and schemes is available for a smaller number of major schemes, as discussed below.

3.2. An in-depth view of major schemes

The main source of information on the use of voluntary sustainability standards and related schemes is the *State of Sustainable Markets* report by ITC, FiBL, and IISD, covering twelve major schemes related to agriculture and food.[4] (Rainforest Alliance and UTZ merged in 2018 but are still treated as distinct schemes here). Table 8 summarises their key characteristics, while Figure 2 shows global indicators. As Table 8 makes clear, all of these schemes typically include not only an environmental focus, but a social and an economic focus as well, although the scope, detail and relative importance and stringency of these dimensions differs by scheme.[5]

As Figure 2 shows, in terms of the number of certified producers worldwide, the most popular schemes are various organic standards (which differ by country), as well as the Fairtrade, Better Cotton Initiative, and Rainforest Alliance standards. In terms of certified area, organic standards clearly dominate. Expressed as a share of the global production area, certification is most significant for cocoa, cotton, coffee, and tea. By contrast, certification plays a smaller role for other commodities, notably soybeans.

Between 2008 and 2019, strong growth was seen in the certified area of cotton (which grew by a factor of 56x), sugarcane (47x), oil palm (25x), and cocoa (18x). Growth was more muted for soybeans, although even here total certified area expanded by about 37% over this period. In recent years, growth has slowed for most commodities.

[4] In addition, the publication covers two forestry-related standards (FSC and PEFC), which are not discussed here. One widely used standard not covered here is the ISO 14001 standard for environmental management systems. The ISO 14001 standard is not specific to the agri-food sector and does not provide specific targets or requirements on environmental performance, but sets out organizational processes to improve environmental performance (e.g. through target setting and monitoring).

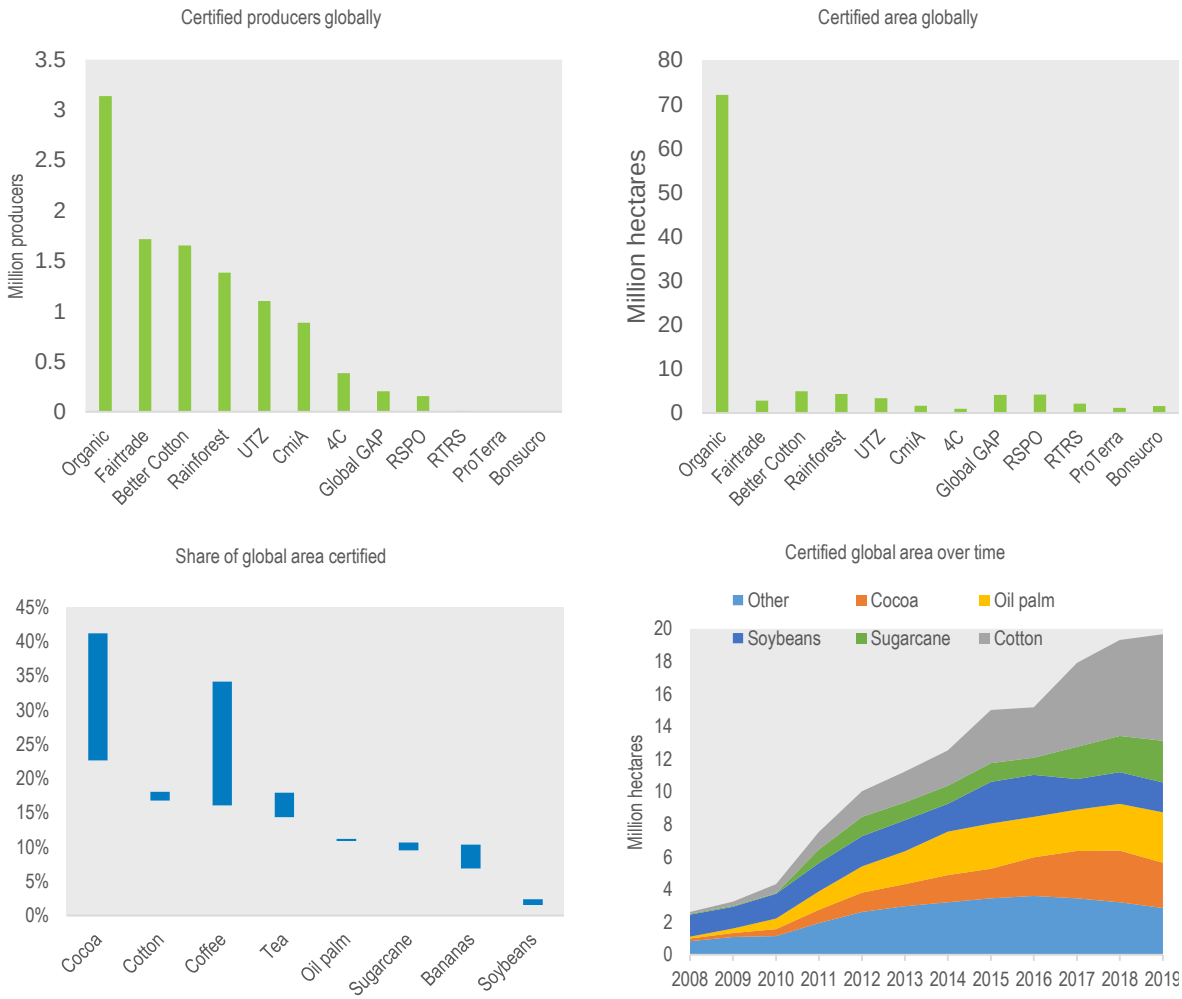
[5] It is important to note that the requirements mentioned in Table 8 are as reported by the standards; in reality, initiatives may not emphasise all of these equally.

Table 8. Key characteristics of major sustainability standards in agriculture and food

Standard	Process/ performance	Year initiated	Environmental focus	Social focus	Economic focus
Better Cotton Initiative	Process	2005	Crop protection, water stewardship, soil health, biodiversity, responsible land use	Decent work conditions	Fiber quality, management systems
Bonsucro (sugarcane)	Performance	2008	Manage biodiversity and ecosystem services, additional biofuel requirements under EU renewable energy directive	Obey the law, respect human rights and labor standards	Production efficiency, continuously improve key areas of the business
Common Code for the Coffee Community (4C)	Process	2006	Biodiversity, energy, soil management, waste management, water management	Work and labor rights, working conditions, gender, health and safety	Profitability and productivity, capacity development, record keeping, market access/information, quality, traceability
Cotton Made in Africa	Process	2005	Responsible land use, enhance biodiversity, and protect climate and environment; GMO-free cotton, care for water and soil; minimize adverse impacts of crop protection	Responsible business conduct, support smallholder farmers, decent work, respect children's' rights and gender equality	Effective management systems; access to high quality inputs and pre-financing; increase productivity and fiber quality; improving living conditions and resilience
Fairtrade	Process	1997	Agricultural practices e.g. agrochemicals, waste, soil and water, GMOs	Social development, e.g. organizational transparency, worker rights and security, working conditions	Required minimum price and/or price premium (the latter is invested in quality of life improvements), pre-financing
Global Good Agricultural Practices (GAP)	Process	1997	Waste and pollution management, conservation	Worker health, safety, and welfare, complaints management	Site management, record-keeping, hygiene, recall procedure
Organic cropland	Process	1972	Organic ecosystems, crop production	Social justice	Processing and handling
Proterra	Process	2012	Biodiversity conservation, effective env. management; no GMOs; pollution and waste mgmt.; water mgmt.; GHG and energy; adoption of good ag. practices	Compliance with law; human rights and responsible labor practices; responsible relations with workers & community	Traceability and chain of custody
Rainforest Alliance	Process but some outcome criteria	1987	Biodiversity conservation, natural resource conservation	Improved livelihoods and human well-being (e.g. working conditions)	Effective planning and management
Roundtable on Responsible Soy	Process	2006	Environmental responsibility, good agricultural practices	Legal compliance, responsible labor conditions & community relations	Good business practices
Roundtable on Sustainable Palm Oil	Process	2004	Protect, conserve, and enhance ecosystems and the environment	Behave ethically and transparently; operate legally; respect human rights; support smallholder inclusion; respect workers' rights and conditions	Optimise productivity, efficiency, positive impacts, and resilience
UTZ	Process	2002	Soil, waste, water, biodiversity, energy	Labor rights, health and safety, employment conditions, human rights	Price premiums

Note: A standard is categorized here as "process-based" if it specifies practices that must be implemented; a standard is "performance based" if it specifies outcomes to be achieved. The two approaches can co-exist within the same standard.
Source: Traldi (2021).

Figure 2. Key indicators for major sustainability standards in agriculture and food (2019)



Note: "Organic" refers to various organic standards around the world. Better Cotton refers to the Better Cotton Initiative; Rainforest refers to the Rainforest Alliance; CmiA is Cotton Made in Africa; RSPO is Roundtable on Sustainable Palm Oil; RTRS is Round Table on Responsible Soy. As the same farm may be certified by several standards, the bottom left panel shows the range between the minimum area (assuming full overlap) and the maximum area (assuming minimal overlap). The bottom right panel shows the evolution of the minimum area.
Source: Based on Meemken et al. (2021), updated using ITC/FiBL/IISD (2021).

Looking at the same set of major crop standards, Tayleur et al. (2017) found these have widespread global reach, as certified cropland could be found in 133 countries. At the same time, Tayleur et al. (2017) point out that sustainability standards tend to be especially popular for a handful of commodities such as palm oil, coffee, or tea, with much lower coverage for crops such as maize, rice, and wheat, despite the large area globally covered by the latter.

In addition to these well-known schemes and labels, in recent years new initiatives have emerged which communicate environmental *impacts* of products, rather than conformity with voluntary sustainability standards. Box 2 provides a brief overview.

Box 2. The rise of environmental impact labels for agri-food products

Labels on food products usually certify that a product or its producer adheres to specific *practices* codified in voluntary sustainability standards. An important recent trend is towards approaches that communicate environmental *impacts* directly.

For example, the UK-based non-profit Foundation Earth (www.foundation-earth.org) issues environmental front-of-pack labels for food products based on life-cycle assessment. Impacts considered are greenhouse gas emissions, water usage, water pollution, and biodiversity loss. The final score is then translated into a letter-based grade from A+ to G. The Foundation Earth initiative is backed by major food supply chain actors such as Nestlé, Unilever, Starbucks, Danone, and PepsiCo, as well as retailers such as Aldi, Lidl, Tesco, Coop, Sainsbury's, and Marks and Spencer.

The European Commission has developed Product Environmental Footprint (PEF) methods based on life-cycle assessment (European Commission, 2021). The PEF considers sixteen impact categories, including climate change, water use, and land use. The European Commission is also preparing new initiatives around substantiating green claims, with the purpose of reducing the proliferation of different environmental claims and the prevalence of 'greenwashing'. The PEF is expected to play a central role in these initiatives.[1]

The French government is developing a framework for environmental impact labelling of agri-food products, which eventually may become mandatory (if the evolution of EU regulations allows it). In the short run and taking into account EU regulation, the decision to display an environmental impact label on products remains voluntary, but the labelling scheme used will have to fit the mandatory regulatory framework.[2] The government organised an open call for proposals, which led to 18 trial projects organised by private sector and/or civil society organisations, including the Eco-score (discussed below). These were complemented by additional experimental research, contributions by stakeholders, and a review by a scientific council (Hélias et al., 2022). In January 2022, the government submitted its findings to Parliament, concluding that an environmental label for food products is feasible and desirable, although some further analytical and operational refinements are needed (Gouvernement de la République française, 2022).

The French Eco-score initiative (https://docs.score-environnemental.com/) develops a front of pack label summarising environmental impacts of food products into a letter grade from A to E. The Eco-score was launched as part of several trial projects in the context of French policy developments. The Eco-score label starts from a life-cycle assessment on the sixteen impact categories included in the EU Product Environmental Footprint methodology. The underlying data comes from the French Agribalyse database (https://agribalyse.ademe.fr/), jointly developed by the French Environment and Energy Management Agency (ADEME) and INRAE. This database contains life-cycle assessment data for 2 500 food products. A major limitation of the current version of the Eco-score methodology is that it assigns the same life-cycle assessment estimate to every product in the same product category (i.e. it is not yet possible for producers to show that their own product performs better than similar products by competitors). An extension of the methodology to allow for product-specific life cycle assessments is foreseen. The French government is currently working on a methodology that allows differentiating products according to the mode of production, in particular organic farming.[3]

To date, environmental impact labels have not yet been widely used, so robust evidence on their real-world effectiveness is relatively scarce (Deconinck and Hobeika, 2022). Moreover, there are many open questions regarding the optimal process for developing such labels, and the necessary evidence base. These questions are similar to those encountered in the development of simplified nutritional front-of-pack labels, which are currently being studied by the OECD; experience with those labels may thus hold relevant lessons for the development of environmental impact labels.

Available evidence on environmental impacts of food shows that average impacts differ strongly between product categories. At the same time, however, there is a great degree of heterogeneity within the same product category (Deconinck and Hobeika, 2022; Clark et al., 2022; Poore and Nemecek, 2018). To send the right signals to consumers, farmers, and other supply chain actors, environmental

impact labels should therefore ideally communicate *actual* environmental impacts, not merely average impacts. A major question is how this can be done in a cost-effective way (Hélias et al., 2022).[4]

Notes: 1. See https://ec.europa.eu/environment/eussd/smgp/initiative_on_green_claims.htm (accessed 6 April 2022).
2. See Article 2 of LOI n° 2021-1104 du 22 août 2021 portant lutte contre le dérèglement climatique et renforcement de la résilience face à ses effets, Journal Officiel de la République Française (JORF) n°0196 du 24 août 2021.
3. See https://docs.score-environnemental.com/more/evolutions-a-venir#integration-dacv-individualisees (accessed 12 April 2022).
4. Ongoing work by the OECD (through the OECD Food Chain Analysis Network) studies the possibilities and challenges in measuring and communicating environmental impacts of food products.
Source: Deconinck and Hobeika (2022).

4. Do labels change consumer behaviour?

In theory, two conditions need to be fulfilled for labelling schemes to improve the environmental performance of food systems. First, voluntary sustainability standards should indeed improve environmental practices and outcomes on the "supply side". Second, there must be a demand for products produced using these standards. While firms may adhere to voluntary standards in part out of a concern with their reputation, an important factor is whether sustainability standards indeed convince consumers to alter their consumption choices.[6] The question of whether and for what reasons consumers use labels is covered in this section, while the evidence on farm-level effects of voluntary sustainability standards is discussed in the next section.

4.1. There is a gap between consumers' intentions and behaviours

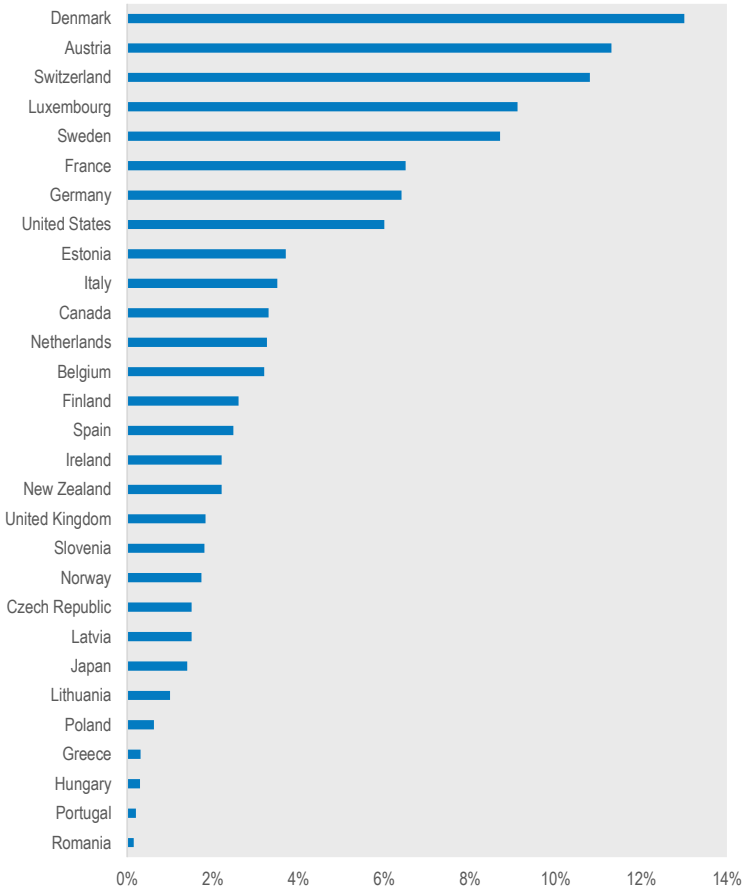
In opinion surveys across countries, consumers routinely indicate that sustainability issues are important to them (Arreza, 2020; Capterra, 2021; BEUC, 2020; EY, 2021; Fabric, 2021; Lusk and Polzin, 2022; PwC, 2019). Moreover, consumers typically also say they are willing to pay more for products that have been produced sustainably (Lusk, 2018), and experimental evidence typically finds that sustainability labels stimulate consumer demand (Potter et al., 2021). According to a meta-analysis of discrete choice experiments, participants were willing to pay a premium of USD 3.79 per kg for food products with a sustainability-related label; willingness to pay was highest for organic labels (Bastounis et al., 2021).

But despite these stated intentions and experimental findings, market shares of products with sustainability labels typically remain low. Figure 3 shows that retail market shares of organic food products in 2020 rarely exceeded 10%. While the relative environmental merits of organic agriculture are debated (see below), organic agriculture is by far the most widely used voluntary sustainability standard (Figure 2); market shares of other sustainability standards are likely to be smaller still, at least when expressed in terms of the overall market rather than that for specific products (e.g. coffee, cocoa).[7]

[6] One intriguing phenomenon is the persistent *oversupply* of certified products. Meemken et al. (2021) report that across various standards, 30-70% of production by certified farmers is nonetheless not sold as certified. There are several possible reasons for this persistent oversupply. One factor might be that production is often organised through farmer organisations: once the expertise and infrastructure is in place to comply with a certification standard, the cost of certifying additional members or adopting additional standards may be low. Moreover, farmer organisations may find it socially difficult to certify some members but not others. Whatever its cause, the oversupply phenomenon implies that data on demand for certified products may understate its impact on the supply side.

[7] Comparable data for other sustainability standards is not readily available, although Lernoud and Willer (2017) report that the retail market share of Fairtrade products in 2015 was considerably below that of organic agriculture in almost all countries for which data was available. While it could be argued that the *sum* of the market shares of the many sustainability standards might add up to a more significant number, in reality many products tend to have multiple certifications; hence, adding up e.g. market shares for organic and Fairtrade products would in fact overstate their actual combined market share.

Figure 3. Market share of organic food products in 2020



Note: Chart shows the organic market share of retail sales (by value) for 2020.
Source: FiBL Statistics, https://statistics.fibl.org/index.html (accessed 28 April 2022).

A systematic review of 60 studies similarly concluded that sustainability labels may increase awareness and (stated) willingness to pay, but that the link with actual behaviour is much smaller or non-existent (Onwezen et al., 2021). Other findings reinforce this point: the 2021 EIT Food TrustTracker® survey found that while 76% of Europeans claim to be motivated to adopt a sustainable lifestyle, only half of them report taking sustainability into account in their food choices (EIT Food, 2022). Furthermore, while in general consumers express a high level of concern for environmental issues, their concern decreases when they consider these issues at the level of the food product (Grunert et al., 2014). Data for the United States similarly show that 77% of consumers believe sustainability is important in choosing which products to buy – yet the market share of sustainability-marketed products (broadly defined) was only 17% of the total consumer packaged goods market in 2021 (IRI and NYU Stern, 2022, 2021).[8] The estimate is based on 36 product categories covering more than 250 000 products including both food (e.g. yoghurt, frozen dinner, chocolate, natural cheese) and non-food (e.g. toilet paper, dish detergent, toothpaste) products. Only in a handful of these categories was the market share of sustainability-marketed products greater than 20%; this includes yoghurt, milk, natural cheese, bottled juice, and coffee. On the other hand, the same study also showed that sustainability-marketed products exhibit stronger growth than the overall market, so that their market share is set to grow in the years ahead. Still, the gap between consumers' stated intentions and actual shopping behaviour is remarkable.

[8] The definition of "sustainability" here is a broad one based on product claims, and is not an assessment of whether products are indeed more sustainable.

4.2. Possible explanations for the gap between intentions and behaviours

The gap between stated intentions and actual behaviours is a well-documented phenomenon in the environmental economics literature, where it is also known as “hypothetical bias”. One review looked at studies which included both hypothetical and actual values of consumer willingness-to-pay, and found that in the median study, the hypothetical willingness-to-pay exceed the actual value by 35% (Murphy et al., 2005). Although there is no widely accepted explanation for this recurring finding, one possible factor is “social acceptability bias” in how people respond to survey questions (Lusk, 2018). It seems likely that in actual shopping contexts, factors such as price, taste, and (perceived) health tend to dominate consumer decision-making (Lusk and Briggeman, 2009; Lusk, 2011). A study in the European Union on factors influencing consumer decisions for milk revealed that quality is consumers’ main consideration, followed by country of origin and environmental impact (European Commission, 2018). In the United States, safety, nutrition, taste, and price are the most important food values for consumers, while fairness, tradition, and origin are valued the least (Lusk and Briggeman, 2009).

Consumer distrust may be another possible explanation for the intention-behaviour gap. For example, research in the United States shows that organic purchases are influenced in part by trust in media and general trust (Dumortier et al., 2017). Other research found that consumers who deem manufacturers and retailers as trustworthy have higher expenditures on organic food (OECD, 2014). The credibility of a label depends on the existence of a credible provider (Fernqvist and Ekelund, 2014), although there appears to be variation in which supply chain actors are deemed most important by consumers. Onwezen et al. (2021) found that European consumers trust labels issued by independent organisations more than those issued by a supermarket. In the United States, trust in institutions participating in the organic certification process did not significantly influence organic purchases, and (dis)trust in the certification and supply chain of organic foods similarly did not appear to be a barrier to market growth (Dumortier et al., 2017). For organic labels in particular, many governments have harmonised domestic standards and labels to avoid a proliferation of claims which could confuse consumers and undermine the sector (Rousset et al., 2015). Research suggests that consumers generally trust such government-backed labels more than others (Roosen et al., 2003).

The EIT Food TrustTracker® 2020 report explicitly investigates consumer trust in the food system through surveys among European consumers (EIT Food, 2021). Compared to other food integrity indicators (authenticity, health, safety, and taste), European consumers report the least trust in sustainability. On average, only 30% of European respondents were confident that food products are generally produced in a sustainable way, with on average 42% of respondents disagreeing with this claim. Lack of trust and scepticism also prevents two-thirds of the sample to be open to adopting new foods (EIT Food, 2022). Consumers report that better labels and transparency from farm to fork would improve their trust and guide more sustainable consumer choices (EIT Food, 2021).

A lack of understanding of sustainability-related food labels or confusion created by a bewildering range of labels might be another factor explaining the gap between stated preferences and actual behaviour. Saviolidis et al. (2020) found that the amount of different sustainability labels on the food market and the lack of consistency at the EU level might lead to confusion about the environmental impacts of different food categories and products. On the other hand, Grunert et al. (2014) found that while Western consumers indeed have limited awareness of sustainability labels, they can generally guess their meaning. The EU organic certified label is also generally well understood and recognised by European consumers (Saviolidis et al., 2020).[9]

Consumers may also have low confidence that their choices can influence environmental impacts. The 2021 EIT Food TrustTracker® survey found that European consumers feel empowered in making personal food choices when it comes to health but feel that sustainability is more difficult to affect through individual shopping behaviour (EIT Food, 2021).

[9] An OECD consumer survey indicated significant variations in recognition of the organic label among OECD countries, ranging from 90% in France and Sweden to less than 30% in Australia. On average, about half of the consumers who recognised the label also used it. In general, the study showed that consumers who recognise the label and who trust it are also willing to pay more (OECD, 2014).

In 2022, OECD collaborated with EIT Food to extend its survey to Canada, where consumers were asked additional, specific questions about sustainability labels to test some of these hypotheses (Box 3). The responses suggest that taste, health, and price are more important drivers of food choices than whether a product has a sustainability label. While consumers reported that they care about the environment, and even indicate that they consider it a moral obligation to use environmentally friendly products, they simultaneously report not being willing to pay extra for food with a sustainability label. Canadian consumers were also asked whether they trust that products with a sustainability label are better for the environment, and whether they find sustainability labels confusing. On both statements, consumers on average neither agreed nor disagreed. While this suggests that confusion may not be the most important obstacle, it also suggests that consumers are not convinced that sustainability labels are a reliable signal, or that the term sustainability has an ambiguous meaning.

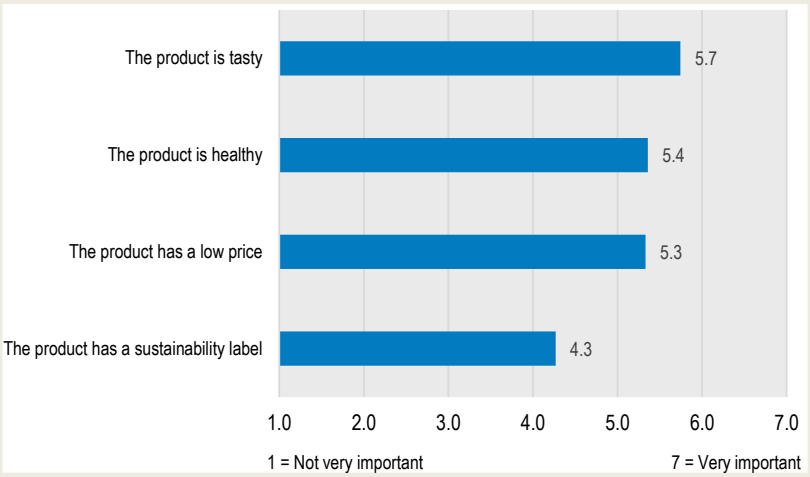
Box 3. EIT Food TrustTracker® survey on sustainability labels in Canada

To gather empirical evidence on consumers' perceptions of voluntary sustainability standards and their associated labels, OECD collaborated with EIT Food to organise the EIT Food TrustTracker® survey in Canada, accompanied by additional questions on consumers' views on sustainability labels. The survey was conducted by Ipsos in July-August 2022 among a representative sample of 1 000 Canadian consumers.[1]

One question asked consumers to evaluate the importance of a product's taste, healthiness, low price, or presence of a sustainability label in choosing a food product (Figure 4). On a scale from 1 to 7 (where 1 means "not very important" and 7 means "very important") consumers ranked taste as the most important attribute, followed by whether a product is healthy and whether it has a low price. The presence of a sustainability label was markedly less important.

Figure 4. Importance of food attributes to Canadian consumers

In the following, we list a number of things that can be important when choosing a food product. Please indicate how important they are for you when choosing food

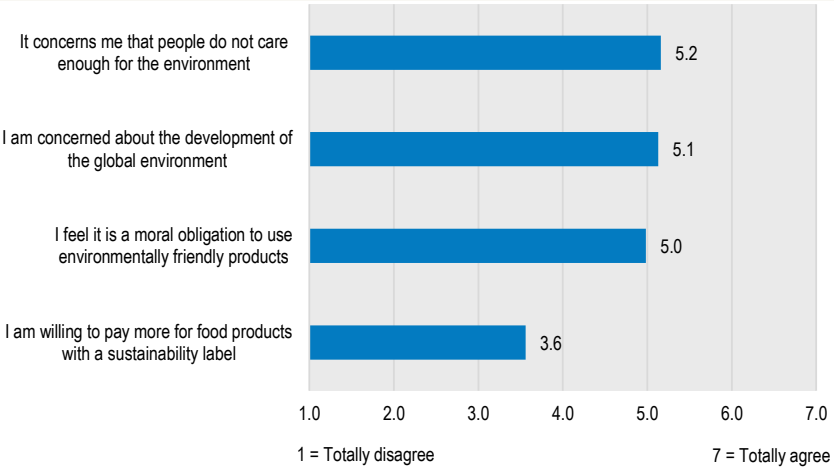


Note: The "sustainability label" option additionally gave the following examples: "e.g. FairTrade, Organic, Rainforest Alliance, Aquaculture/Marine Stewardship Council (ASC/MSC), Roundtable on Sustainable Palm Oil (RSPO), eco-label or other certification to indicate sustainable production".
Source: EIT Food TrustTracker® survey 2022.

Other questions asked consumers to rate their agreement or disagreement with various statements. Figure 5 juxtaposes the survey responses on a question about environmental concerns and a question about willingness to pay for food products with a sustainability label. While consumers indicate their concern about the environment, and even their sense of moral obligation to use environmentally friendly products, the average consumer in Canada also indicates *not* being willing to pay extra for food products with a sustainability label.

Figure 5. Consumers' environmental concerns and willingness to pay for sustainability labels

To what extent do you agree or disagree with the following statements?

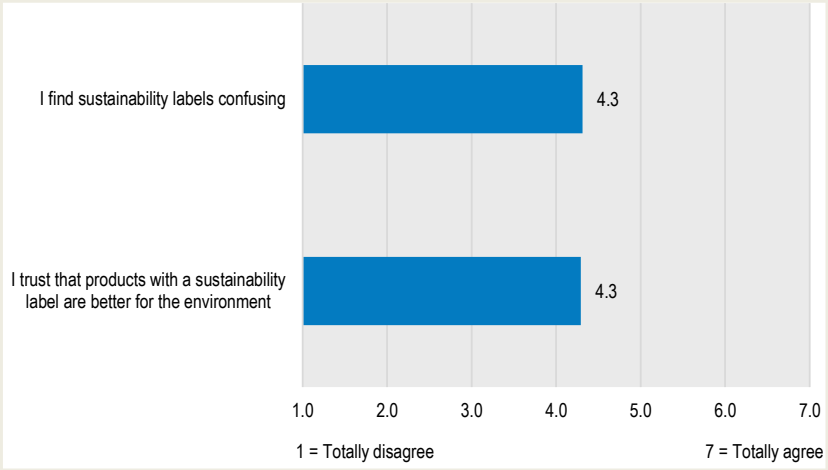


Note: The first three statements were part of the question *"To what extent do you agree or disagree with the following statements about your approach to healthy/sustainable food?"*, the last statement was part of a question asking respondents whether they agreed or disagreed with three statements specifically about sustainability labels, with the other two statements asking about trust and confusion.
Source: EIT Food TrustTracker® survey 2022.

The survey also asked whether consumers trust that products with a sustainability label are better for the environment, and whether they find sustainability labels confusing. These two questions can shed light on possible reasons behind the low willingness to pay for sustainability labels. Figure 6 shows that consumers on average neither agreed nor disagreed with the two statements. This suggests that possible confusion may not be the most important obstacle. On the other hand, the relatively low trust score might indicate that consumers are not convinced that products with a sustainability claim are actually better.

Figure 6. Consumer trust and confusion regarding sustainability labels

To what extent do you agree or disagree with the following statements?



Note: The two statements were part of a question asking respondents whether they agreed or disagreed with three statements specifically about sustainability labels, with the other statements asking about willingness to pay.
Source: EIT Food TrustTracker® survey 2022.

Note: 1. Sampling was via Computer Assisted Web Interviewing (CAWI), and the main fieldwork took place July and August 2022. 51% of the Canadian sample were female, 28% were 18-34, 32% were 35-54 and 40% were 55+ years of age. The EIT Food TrustTracker® model, methodology, sampling, and main survey questions are described in detail in Macready et al. (2020).

4.3. Labels are more effective for some consumer segments than others

It should not be overlooked that sustainability labels do lead to higher purchases for some segments of consumers. Labelling seems mainly effective for those consumers who are already motivated or educated about sustainability (Onwezen et al., 2021). Similar results have been found in an experimental study by the European Commission (2019). Moreover, a 2011 consumer survey by the OECD shows that consumers involved in an organisation related to environmental issues have higher mean expenditures on fruit and vegetables with the organic label than those who do not (OECD, 2014). Some consumers also appear to use purchases of products with sustainability labels as a way to express their identity or political values. Labelled products may in this case be considered as conspicuous consumption items (Asioli et al., 2020).

Moreover, the success of sustainability labels varies considerably by country (as Figure 3Figure 3 shows). In Switzerland, for example, the relative success of sustainability-related food labels has been explained by the high environmental awareness of the population (Engels et al., 2010; Franzen, 2003).[10]

5. What are the farm-level effects?

As noted earlier, sustainability standards tend to focus on the agricultural production stage of the product life cycle, with other stages much less frequently covered (Ta ble 5). One challenge in evaluating the effects of voluntary sustainability standards on certified producers is that participation in a scheme is rarely random. Observed differences between farmers with and without certification therefore do not necessarily reflect a causal effect of certification. Recent empirical studies use rigorous research designs to overcome this problem. A number of papers have systematically reviewed this literature on the effects of voluntary sustainability standards on outcomes such as on-farm environmental impacts or farmer livelihoods, with a focus on studies using a credible research design (DeFries et al., 2017; Oya et al., 2018; Meemken, 2020; Traldi, 2021).[11] The most recent of these reviews, by Traldi (2021), covers 45 peer-reviewed studies, including studies covered by earlier reviews.

5.1. Some crops, standards, and geographies have been studied more than others

Traldi (2021) first shows that there is a mismatch between what is covered by standards, and what is covered by the literature: some crops, standards, and countries are overrepresented in the literature relative to the importance of certified production, while others are underrepresented. In particular, 75% of the available literature focuses on coffee, which constitutes only 11% of the area of all certified crops globally (among the major sustainability standards). Cotton, by contrast, accounts for 22% of the area of all certified crops, but was only covered by a single study (1.5% of the total), while sugar (8.5% of the area of all certified crops) and soybeans (7.8%) were not studied at all.

A similar mismatch exists for the types of standards. The available literature has disproportionately studied Fairtrade and UTZ/Rainforest Alliance, while some other standards have not been studied at all. Relative to its large share (72%) of the total certified area, organic standards also appear understudied (at 21% of the study coverage). Geographically, most studies covered Africa (51%) or Latin America (34%), while none of the studies identified by Traldi (2021) studied schemes in North America or Australia. Brazil, Indonesia, Ivory Coast and several other countries with widespread certification are also underrepresented.

[10] Even where positive effects on consumption behaviour exist, researchers have raised concerns over a possible "rebound effect", where consumers who buy products with a sustainability label may believe they have acted "sustainably enough", and consequently increase their overall consumption or their consumption of other products that increase their environmental footprint (Asioli et al., 2020; Engel & Szech, 2020; Yokessa & Marette, 2019). Other researchers have also pointed out that by their nature, sustainability labels do not account for consumption *levels* and may not promote an overall shift in food consumption patterns (Lim, 2017; Jackson, 2017, Poux and Aubert, 2018).

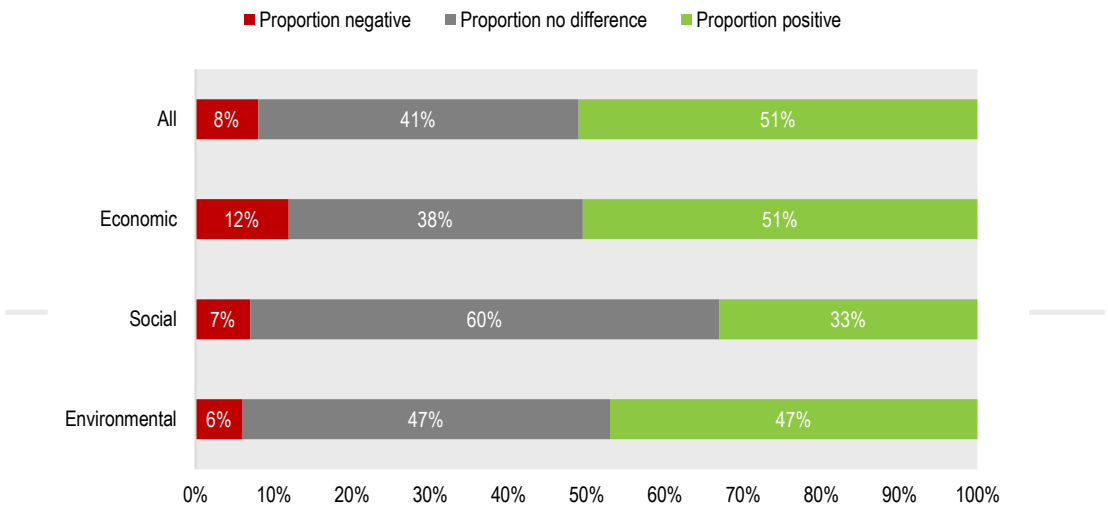
[11] A related review by Garrett et al. (2021) looks at a broader range of food supply chain policies, but a narrower set of impacts (forest conservation and livelihoods).

5.2. Studies find mostly positive or zero effects on economic, social, and environmental outcomes

Most of the studies reviewed by Traldi (2021) look at economic outcomes (84%), with less frequent analysis of social (43%) or environmental (43%) outcomes, and only 20% of studies looking at all three dimensions together. As a high-level summary of results, Figure 7 shows the proportion of study findings which are negative, inconclusive, or positive along these different outcome dimensions. Across all dimensions, the published literature tends to mostly find positive or zero effects of sustainability standards on economic, social, or environmental outcomes.

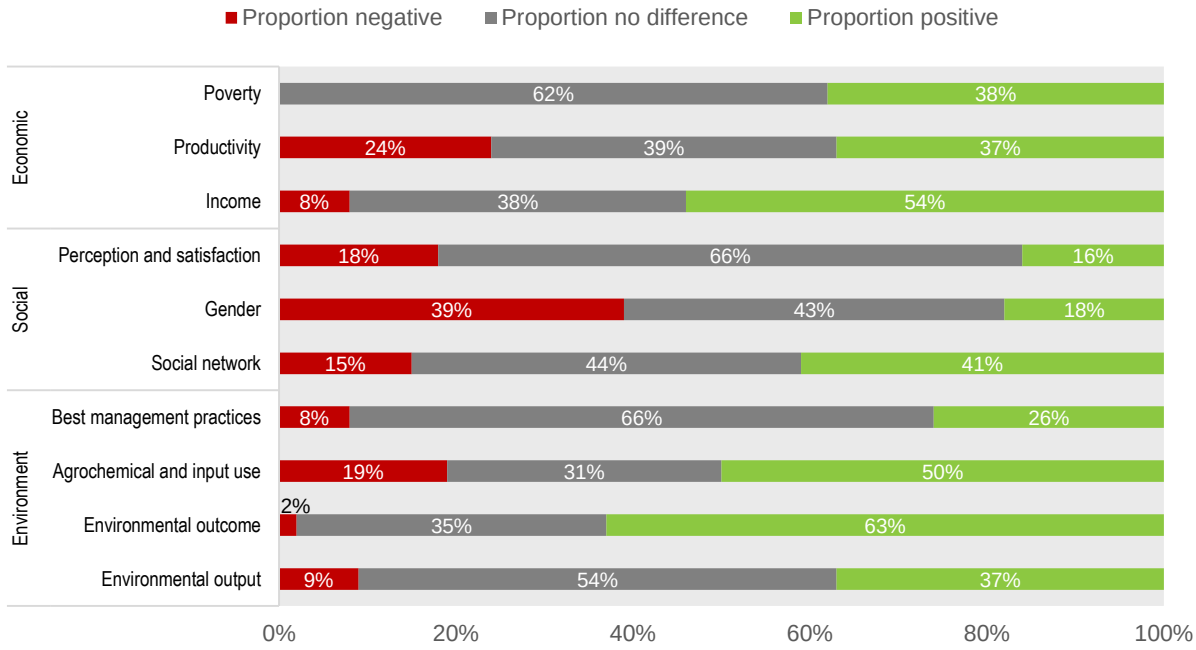
Figure 8 provides more detail for selected indicators, broadly confirming the overall conclusion that studies often find no discernible effects but, where an effect is found, it tends to be more frequently positive than negative. (One notable exception here is gender issues). For the environmental indicators in particular, the available evidence suggests that positive effects outweigh negative effects, although a significant share of studies do not find any measurable impact. One challenge with measuring environmental indicators is that studies often focus more on practices than on actual outcomes: Traldi (2021) notes that while 38% of the studies looked at environmental aspects, only 22% explicitly considered environmental outcomes.

Figure 7. Effects of sustainability standards on major sustainability dimensions



Note: Chart shows the proportion of study results showing negative, positive, or no clear effects (using conventional statistical significance levels) of voluntary sustainability standards on different sustainability dimensions. The standards covered here are those listed in Table 8.
Source: Adapted from Traldi (2021).

Figure 8. Effects of sustainability standards on specific sustainability indicators



Note: Chart shows the proportion of study results showing negative, positive, or no clear effects (using conventional statistical significance levels) of voluntary sustainability standards on different sustainability indicators. "Environmental output" here refers to practices (e.g. use of compost) while "environmental outcome" refers to actual results (e.g. species abundance, soil carbon stocks). The standards covered here are those listed in Table 8.
Source: Adapted from Traldi (2021).

5.3. Few studies explicitly look at trade-offs and synergies

As Traldi (2021) notes, a proper evaluation of the effectiveness of voluntary sustainability standards should look at possible trade-offs or synergies between the outcomes depicted in Figure 8. Historically, studies tended to focus on only one dimension of sustainability (e.g. only on farm income), making it impossible to assess possible trade-offs or synergies. More recently, however, researchers have started to systematically look at a broader set of impacts, and results do suggest trade-offs may exist, in particular between environmental and economic outcomes.

For example, one particularly detailed study (Vanderhaeghen et al., 2018) compared multiple coffee certifications (Fairtrade-Organic versus UTZ-Rainforest Alliance-4C) in Uganda, measuring various socio-economic outcomes, as well as environmental practices and outcomes. The authors find that UTZ-RA-4C increases the likelihood of practices such as shade trees and intercropping, but also of using agrochemicals; while Fairtrade-Organic reduces the use of inputs but increases the likelihood of soil tillage. Overall, the increased use of agrochemical inputs under the UTZ-RA-4C certification raises yields, labour productivity and income, but at the expense of invertebrate abundance and diversity. These findings illustrate the possibility of trade-offs, and hence the importance of capturing a wide range of outcome variables in conducting evaluations.[12] The importance of trade-offs is also illustrated by the literature assessing the performance of organic agriculture (Box 4).

[12] The standards discussed here are generally NGO- or multi-stakeholder led initiatives open to all. However, firms often also impose company-specific standards on their suppliers. Evidence on such company-specific standards is limited. One notable exception is provided by Thorlakson et al. (2018b), who study requirements on farm environmental performance by a leading South African retailer (Woolworths). Using detailed farm audit information and original survey

Box 4. The environmental performance of organic agriculture is context dependent, but affected by lower yields

Organic agriculture standards occupy a prominent position among voluntary sustainability standards. Seufert and Ramankutty (2017) and Meemken and Qaim (2018) review the substantial literature on the impacts of organic agriculture, and come to similar conclusions: broadly speaking, organic agriculture tends to have better environmental performance *per unit of land*, but due to lower yields (generally 20% smaller than conventional yields) the environmental performance of organic agriculture *per unit of product* is not necessarily superior. Moreover, for a given production volume, organic agriculture would require greater land use. Expansion of agricultural land at the expense of natural ecosystems is a major driver of greenhouse gas emissions and biodiversity loss, yet such land use effects are generally not included in empirical studies comparing organic versus conventional agriculture.

However, both reviews emphasise that the actual environmental performance of organic agriculture is highly context dependent. Seufert and Ramankutty (2017) highlight that organic agriculture performs relatively well when it comes to yields of forage crops such as hay, but worse when it comes to cereals. Similarly, organic agriculture performs better for biodiversity of plants and pollinators in arable systems and simple landscapes, but less well for biodiversity of birds in pastures and extensive agricultural regions. The evidence also suggests that organic agriculture has benefits for livelihoods of farmers who participate in alternative food networks and who are located in regions with low labour costs, but not for farmers without access to premium prices. Meemken and Qaim (2018) similarly emphasise that organic methods can be useful in specific situations.

Both reviews also highlight that the available evidence on organic agriculture is mostly concentrated in high income countries, leading to important evidence gaps for low- and middle-income countries.

Source: Seufert and Ramankutty (2017); Meemken and Qaim (2018)

6. Possible synergies between different approaches

Several approaches exist to improve environmental sustainability along food supply chains (Deconinck and Hobeika, 2022). These include traditional assurance schemes and labels, as well as the newer environmental impact labels, but also e.g. due diligence approaches in line with the OECD-FAO Guidance on Responsible Agricultural Supply Chains (OECD/FAO, 2016).

The previous section noted that some studies have started to investigate trade-offs and synergies among different *outcomes* (e.g. environmental versus economic effects) of existing schemes. However, another source of synergies could exist between different *approaches*. A few examples can illustrate these possibilities.

A first possible source of synergies is between public and private approaches. Rousset et al. (2015) identified several ways in which public and private efforts can interact. Governments can, for example, build regulations on existing private standards, or use compliance with private standards as an option to demonstrate compliance with public regulations. Another possibility is to use lighter public auditing requirements for farmers who have been certified by a private scheme, as is the case for the Red Tractor scheme in the United Kingdom (Box 1). Conversely, public initiatives can help stimulate the growth of the certified sector, for example by encouraging private-sector stakeholders to harmonise their approaches.

Another possible source of synergies is between assurance schemes and due diligence approaches. OECD due diligence guidance frameworks are the global best practice for identifying and addressing environmental and social risks, with the *OECD-FAO Guidance on Responsible Agricultural Supply Chains* (OECD/FAO, 2016) providing specific guidance for the sector. These frameworks can be used to

data, the authors find that the company-specific standard indeed increases the adoption of environmental best practices among fruit, vegetable and flower growers supplying the retailer.

benchmark the large number of schemes to explore which ones are aligned with the government-backed OECD due diligence approach and to suggest how existing schemes could be improved to meet these standards. The OECD is currently undertaking an Alignment Assessment process of industry or multi-stakeholder initiatives across a range of sectors, including in agricultural supply chains.

A third possible source of synergies relates to the earlier finding that assurance schemes typically cover a wide range of topics. In particular, of the 170 agri-food initiatives covered by ITC Standards Map, more than half (55%) have criteria across all five categories (environment, social, quality, management, and ethics), with a further 47 (28%) covering four out of five categories. The in-depth discussion of twelve major sustainability standards similarly showed that these include environmental, economic, and social requirements. While the evidence suggests that consumer labels may not be very effective, standards and assurance schemes are nonetheless widely used in business-to-business contexts (e.g. retailers may decide to source only from farmers with certain certifications). It might be possible to strengthen environmental requirements in some widely used existing schemes, including those which do not have environmental concerns as their main focus. One advantage here may be to reduce the number of separate audits for companies. Industry initiatives have been moving in this direction (GFSI, 2022). Schemes with a strong traceability focus (e.g. for food safety) may be good candidates, as traceability is important to track environmental impacts along food supply chains (Deconinck and Hobeika, 2022; Poore and Nemecek, 2018).

There may also be synergies between more practice-based approaches as found in traditional assurance schemes and labels, and more outcome-oriented approaches such as environmental impact labelling schemes. For example, some environmental outcomes may be inherently harder or costlier to measure, or may show a high degree of variability outside of a producer's control. If scientific evidence shows that certain practices can on average deliver improved outcomes, then a practice-based requirement may be a way to achieve improved environmental outcomes at a lower transaction cost. Conversely, information from environmental impact measurements could be used to investigate which practice-based requirements have the greatest added value, and under which circumstances. Existing practice-based assurance schemes can also incorporate environmental impact measurement into their audits, effectively creating a hybrid scheme. Examples include the Irish Origin Green scheme (which calculates carbon footprints of certified beef and dairy producers), as well as Rainforest Alliance and Bonsucro.[13]

7. What are the implications for policy makers?

It is clear that assurance schemes and associated labels on their own are not a panacea for the environmental challenges of food systems. Still, such schemes can play a role in combination with other public and private initiatives. Several actions can improve the effectiveness of existing and proposed new schemes. Moreover, several actions can also address potential concerns around inclusiveness of schemes, both on the demand side and on the supply side (understood here as the agricultural production stage).

7.1. Actions to improve effectiveness of existing and proposed new schemes

One way of fostering consumers' understanding and trust in different types of schemes and labels is to provide greater clarity about claims. For example, the German platform *Siegelklarheit* ('clarity of labels') was launched in 2015 by the German government to help consumers in verifying the credibility and level of ambition of labels in various product groups (ITC, 2021). The Swiss database Labelinfo.ch similarly offers open source information on 135 quality seals and 19 declarations to assist consumers and businesses in making more responsible decisions (ITC, 2021). Civil society organisations (including consumer organisations) can play an important role in scrutinising environmental claims and in denouncing

[13] For Origin Green, see https://www.origingreen.ie/who-is-involved/producers/carbon-footprint-assessments/ (accessed 19 May 2023). For an overview of sustainability standards using environmental impact measurement, see https://coolfarmtool.org/2022/12/certification-standards-and-the-cool-farm-tool/ (accessed 19 May 2023).

greenwashing. As noted earlier, in some cases (e.g. organic labels) governments have developed a voluntary public standard to avoid fragmentation and confusion (Rousset et al., 2015).

Secondly, retailers can modify the food environment (e.g. which products are displayed more prominently, and alongside which other products) to nudge consumers towards food products with a lower environmental impact, and policy makers can support this through incentives or regulations. Research suggests that altering the food environment is more effective than providing information through labels (Onwezen et al., 2021). Retailers could for instance provide more shelf space to food products with a better environmental impact. Another possibility is for retailers to provide consumers with the total environmental impact of their purchases (e.g. displayed on the shopping bill). In online shopping environments, retailers could also suggest product alternatives with better environmental impacts.[14]

7.2. Actions to improve inclusiveness on the demand side

Existing schemes typically involve a price premium relative to similar unlabelled products. As a result, these products may be out of reach for lower-income consumers. In response, several proposals have been made to improve affordability for these consumers, for example through vouchers (I4CE, 2022), or greater social spending to increase household budgets of lower-income consumers and financial support on the producer side to lower costs (Huber et al., 2022).

However, it is not clear that greater environmental sustainability must necessarily come at a higher cost to consumers. Since environmental impacts differ strongly between different food products and between producers of the same product (Poore and Nemecek, 2018), there is considerable scope to steer consumers in high-income countries towards products with a lower environmental footprint without necessarily compromising on affordability or nutritional quality, including through a shift towards more plant-based diets (I4CE, 2021; WWF, 2017; Fardet et al., 2021).

These findings point to a key difference between traditional labelling schemes and newer environmental impact labels. By their very nature, traditional labelling schemes focus on a comparison *within* the same product category (e.g. chocolate with and without a Fairtrade label), in which case price premiums are likely, leading to concerns around affordability. In contrast, environmental impact labels could facilitate comparisons *between* product categories (as well as within those categories if information on actual impacts is used rather than averages). Consumers could then also reduce the environmental footprint of their purchases by shifting between product categories, e.g. by purchasing less chocolate overall (which has a relatively high environmental footprint due to land use effects - cfr. Poore and Nemecek, 2018). Environmental impact labels facilitate such choices, whereas traditional labelling schemes do not. Such choices may well lead to reduced expenditures: consumer choice experiments in France suggest that environmental impact labels can reduce the overall environmental impact of consumers' food choices at lower costs (Soler et al., 2021).

7.3. Actions to improve inclusiveness on the supply side

Implementing any kind of assurance scheme increases costs for participants along the supply chain (Meemken et al., 2021). There is a large literature addressing the question of whether schemes therefore exclude poor producers (Beghin et al., 2015). A recent review by Meemken et al. (2021) concludes that resource-poor farmers do actively participate in certified supply chains. The practice of group certification (where e.g. all members of a cooperative become certified at once) and external support (e.g. by development agencies) may explain this. At the same time, certification is usually concentrated in middle-income countries rather than low-income countries, so that the most marginalised producers are indeed at risk of being excluded from opportunities in higher-value certified supply chains; this may be related to e.g. poor infrastructure or institutions in those countries (Meemken et al., 2021). Institutional design features of assurance schemes also influence how "producer friendly" these standards are. In particular, participation in meta-governance organisations such as ISEAL is strongly associated with greater "producer friendliness" (e.g. provision of technical and financial assistance to producers) (Fiorini et al., 2019).

[14] The OECD thanks Koen Boone of The Sustainability Consortium for these examples.

A second cost for producers is that improving their environmental performance may require costly investments in innovative production practices, or at least reduced profits during a transition period (Asioli et al., 2020). Again, these costs are likely to pose a heavier burden for SMEs compared to larger firms, suggesting a role for targeted public intervention to ensure that these initiatives do not unnecessarily harm SMEs, raise entry barriers, or reduce competition.

8. Conclusion

Assurance schemes based on voluntary sustainability standards, and their associated labels, can provide a solution to the asymmetric information problem that plagues the market provision of "credence" attributes (i.e. attributes which cannot be observed by the consumer, even after consuming the product). By defining requirements through voluntary sustainability standards, assessing the conformity of products or producers against these requirements, and then communicating the results to consumers through a label, a credible assurance scheme can in principle transform a "credence" attribute into a "search" attribute: consumers can simply search for products whose label communicates the sustainability characteristics they are looking for (e.g. environmentally friendly, Fairtrade).

Voluntary sustainability standards in the agri-food sector typically cover several domains (e.g. environmental, social, and ethical aspects); environmental requirements appear especially common. Schemes are often based on private standards, using independent third-party assessment, and traceability or chain of custody requirements.

Among the many standards and labels, a dozen leading schemes such as organic standards, Fairtrade, and UTZ/Rainforest Alliance are particularly important in terms of the number of producers and production area certified globally. These schemes have shown strong growth in terms of the certified area, even if growth rates have slowed down in recent years.

A new trend is the growth of environmental impact labels, which communicate environmental impacts rather than conformity with process or production requirements, with both public initiatives (e.g. the EU Product Environmental Footprint, French policy initiatives) and private ones (e.g. Foundation Earth). To send the right signals to consumers, farmers, and other supply chain actors, these schemes should ideally communicate actual environmental impacts rather than product averages. A key question is how this can be done in a cost-effective manner.

In theory, two conditions should be fulfilled if assurance schemes and labels are to play a positive role in reducing environmental impacts from food systems. First, consumers should actually use these schemes in guiding their consumption decisions; second, the schemes themselves should have positive effects on environmental outcomes.

On the demand side, while consumers generally affirm the importance of sustainability in surveys and experimental settings, the impact of labels on actual shopping behaviours is limited. Retail market shares for organic food products – one of the best-known schemes, which has been around for decades in most countries – are generally below 10%, and market shares for other schemes are likely to be even smaller in terms of the overall market of food products (even if some schemes may have high market shares for specific products such as coffee or cocoa). Evidence generally shows that labels only have a limited impact on consumers' purchasing decisions, although effects appear larger for some consumer segments (particularly consumers who are already motivated or informed about sustainability). Survey data for Canada confirms that taste, health, and price are more important to consumers than whether a product has a sustainability label. The survey data also suggest that while consumer confusion over labels may not be the most important obstacle, consumers may simultaneously not be convinced that sustainability labels are a reliable signal.

Regarding farm-level effects of sustainability standards on economic, social, and environmental dimensions, not all crops, standards, and geographies have been equally well studied. A considerable share of available studies find no discernible impact. However, when an effect is found, it is usually positive. For organic agriculture, environmental performance is highly context dependent, but generally affected by persistent yield gaps of organic versus conventional methods: while organic agriculture often shows improved environmental outcomes per unit of land, this is not necessarily the case per unit of product.

Several actions can improve the effectiveness of both existing and proposed new schemes, as well as guaranteeing greater inclusiveness. For example, governments can provide greater clarity on the meaning of different schemes (e.g. through public websites). Governments and retailers can also work together to improve the food environment, providing nudges to consumers to improve the sustainability of their purchases. Schemes impose extra costs on supply chain actors, which could potentially exclude resource-poor farmers (particularly in low-income countries) and SMEs; targeted interventions (e.g. technical assistance) can help here. On the demand side, existing schemes often imply price premiums, which may put these out of reach for lower-income consumers. However, experimental evidence suggests that there may be some scope for improving the environmental impact of food consumption choices without necessarily increasing household expenditures, given the potential to encourage consumers to shift between and within product groups by basing their decisions on environmental impact labels.

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