Policy case study – Food labelling

Climate for Sustainable Growth

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This paper was prepared for the CEPS Project entitled Climate for Sustainable Growth.

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This case study is part of the CEPS project 'Climate for Sustainable Growth', whose main objective is to analyse the impacts of climate change mitigation measures on the three pillars of sustainable development: the economic, environmental and social dimensions.

It does so by looking at the positive as well as negative, both intended and unintended, impacts of climate change mitigation policies and projects. While this case study fully recognizes that policies have both positive and negative impacts, the focus of is on (potential) negative impacts of climate change mitigation policies.

The structure of this case study comprises of four sections:

(1) Sector characteristics,
(2) Climate-related policies,
(3) Environmental, social and economic impacts of climate mitigation policies,
(4) Measures to mitigate impacts of mitigation policies,

This case study, and the methodology it follows, are not intended to analyse the merit of the policies and measures that are being implemented, or their effectiveness and efficiency, but will focus on their socio-economic-environmental impacts, and measures to alleviate these impacts in the period of transition.

It is important to note that lack of information and analysis of impacts and tools to mitigate negative impacts can act as a brake on ambitious climate action. This case study and the overall project's focus should be seen in this light.

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Executive Summary

This study, which is part of the project entitled "Climate for Sustainable Growth", focuses on one particular policy tool used in the agricultural sector, food labelling. It reviews food carbon labelling when put in place with clear objectives to address climate change.

This study examines whether food carbon labels, as climate mitigation tools, are put in place in a sustainable way, by identifying their impacts on the three dimensions of sustainable development: 1) economic 2) social and 3) environmental.

This case study examines both domestic, as well as international (in other jurisdictions) impacts of food labelling, and then focuses on the measures that are put in place to mitigate the (potential) negative impacts identified. While domestic impacts of food labelling can be addressed through safety nets that exist in jurisdictions that introduce food labelling (e.g. the EU), the case study also discusses international tools and safety nets available in that jurisdiction, as well as internationally.

Given the broad scope of the topic, this study sets boundaries through the selection of a limited number of food labels. These policies have general environmental objectives, but also target, directly or indirectly, climate change. This study looks at:

- Cocoa labelling in Ghana (Rainforest Alliance, UTZ, organic and FairTrade labels)
- The Roundtable for Sustainable Palm Oil (RSPO) production and
- The EU's efforts towards a product environmental footprint (not strictly a labelling regime, but closely related).

It finds that food labels have both positive and negative impacts on the three dimensions of sustainable development. Most impacts were positive, and this is to be expected given the public welfare objectives that drive the underlying policies.

Firstly, in a national context in Ghana, cocoa labelling has had wide-ranging impacts. Cocoa labelling has had unintended economic impacts by favouring large cocoa producers at the expense of small producers. On the other hand, smallholders have increasingly started selling cocoa via cooperatives which has generated positive economic impacts by providing producers who joined Rainforest Alliance, Fairtrade and UTZ certification e.g. with better access to credit as well as an increase in income (a net return of $225/tonne). Perhaps the most important economic impact has been increased productivity, which is the result of the necessary producer training in good agricultural practices. Increased productivity actually tends to be more significant than price premiums for increasing incomes.

Training in good agricultural practices also created positive social and environmental impacts (e.g. trained producers scored better in proper use of toxic chemicals, such as pesticides and fungicides, and used smaller doses of chemicals than non-trained producers). Further evidence of positive environmental impacts of cocoa labelling in Ghana was found as certified producers (Rainforest Alliance), were, for example, more likely to have at least one soil conservation measure in place (43%) in comparison to non-certified producers (5%).

Secondly, this study finds that the Roundtable for Sustainable Palm Oil (RSPO) production has both positive and negative impacts at international level. The main positive economic impact, and the aim of the regime, is preservation of market share for palm oil in the face of negative public views of the supply chain. RSPO also creates other positive economic impacts, e.g. by contributing to quality improvement and productivity, as producers are forced to implement good practices of production, harvest, handling and management. Also, premiums of RSPO certified palm oil (ranging from zero to $30 per tonne) are a clear positive economic impact.

On the other hand, the RSPO can favour large producers at the expense of SMEs who need training and capacity-building in order to understand the standards and comply with them. Unintended economic impacts, although difficult to quantify, might also occur e.g. from RSPO's requirement to limit the types of land on which palm oil production can expand. Since this would arguably limit supply, the cost of palm oil can contribute to food insecurity for consumers in particular in South- and South-East Asia (who account for roughly 60% of global imports).

This study also finds positive and negative social impacts of RSPO production. As palm oil is a particularly labour-intensive crop, it creates more jobs than its closest substitutes (soybean oil and rapeseed oil). Therefore maintenance of market share for palm oil, which is linked to RSPO certification, has contributes in a positive manner to livelihood and poverty alleviation. On the other hand, the possible decrease in food security has a negative social impact.

This study finds that RSPO production can have positive and negative environmental impacts. The most significant impacts relate to standards that discourage clearing of peat swamp-land for cultivation. If the elements in RSPO's 2013 revised principles and criteria (which have not yet entered into force) are followed strictly, they will lead to significant GHG emissions reductions.

RSPO production can also limit clearing of primary forests and biodiversity loss since it e.g. prohibits clearing of "high conservation value" (HCV) land. On the other hand, RSPO production may have negative environmental impacts, if it is true (as alleged) that RSPO members regularly cheat on their commitments. This would mean that the existence of the RSPO would have negative impacts, since if it did not exist there would at least be more openness about the nature of the transgressions.

Thirdly, positive and negative impacts are found as a result of the EU's efforts towards product environmental footprinting (PEF). In this example, however, fewer impacts on the three dimensions (economic, social and environmental) of sustainable development are identified, since this regime is still in a pilot phase.

The main contribution of a harmonised regime of product environmental footprinting would be a greater ability for green goods producers to sell into markets which, in the absence of a harmonised standard, would have a costly variety of differing standards. If this were to evolve and become mandatory, however, a harmonised regime could hurt small producers for whom it is more difficult to meet these standards. Goods that rely on many small producers at the base of the value chain (like cocoa, palm oil, shrimp, rice and other major developing country agri-food exports) would tend to suffer disproportionately.

This case study finds that flanking measures were put in place to mitigate the negative impacts of food labels studied. Domestically in Ghana, negative economic impacts on small producers (cocoa labelling in Ghana) were mitigated with intensive training and capacity building. In the case of RSPO, a RSPO Smallholder Support Fund was put in place 2013, recognising the special challenges faced by smallholders (defined as 50 hectares or less) in the palm oil sector at international level. Similar funds might further mitigate the impacts of food labels, and special rules or institutions for SMEs might be established offering e.g. simplified verification to small producers.

Ultimately it is impossible to mitigate the negative impacts of climate-related food labels if those impacts are not known. An efficient way to better understand these sorts of impacts is to ask affected parties to come forward with their input, both during the process of formulating the standards and on an ongoing basis. The EU's PEF programme has engaged with a broad range of relevant stakeholders in its current phase, though it could do more to reach out to foreign producers. To understand the impact of their schemes, UTZ and Rainforest Alliance have used an objective non-governmental organisation, COSA, to conduct public and critical assessments of their impacts.

This case study finds that food labels in the agricultural sector have impacts not only in their intended target area, but also in other facets of public policy – economic, social and environmental. Beyond the lessons learned specific to the food labelling case, the analysis here supports the notion that any climate change policies should be carefully assessed for their broader sustainable development impacts, domestically and internationally, both in their initial elaboration, as well as on an ongoing basis.

It must be emphasized that this discussion must not be in any way be interpreted or construed as encouraging lack of mitigation action. On the contrary, it must be seen as providing a way forward that will ensure that action can be undertaken with full support by all stakeholders, domestic and international.

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1. Sector Characteristics

1.1. *Economic characteristics of the sector*

Agriculture is one of the most economically important sectors globally, occupying a significant share of global gross domestic product (GDP), engaging a disproportionate share of developing country workers, and constituting one of the most important single traded sectors of merchandise goods.[1]

Figure 1 shows agricultural value-added in current (2005) USD, showing the equivalent of roughly 2.2 trillion USD globally as of 2013.[2] In terms of share of GDP, value added in agriculture globally constitutes 3% of GDP.[3] But that figure embodies a wide range of values, from 1% in North America and 2% in OECD countries to 19% in South Asia and 14% in developing sub-Saharan Africa.[4] Figure 2 shows the distribution across low-, middle- and high-income countries, illustrating that dependence on agriculture is almost 20 times higher in low-income than in high-income countries. In absolute terms, developing countries produce most of the world's agricultural products, generating roughly three-quarters of global agricultural value added (FAO, 2012).

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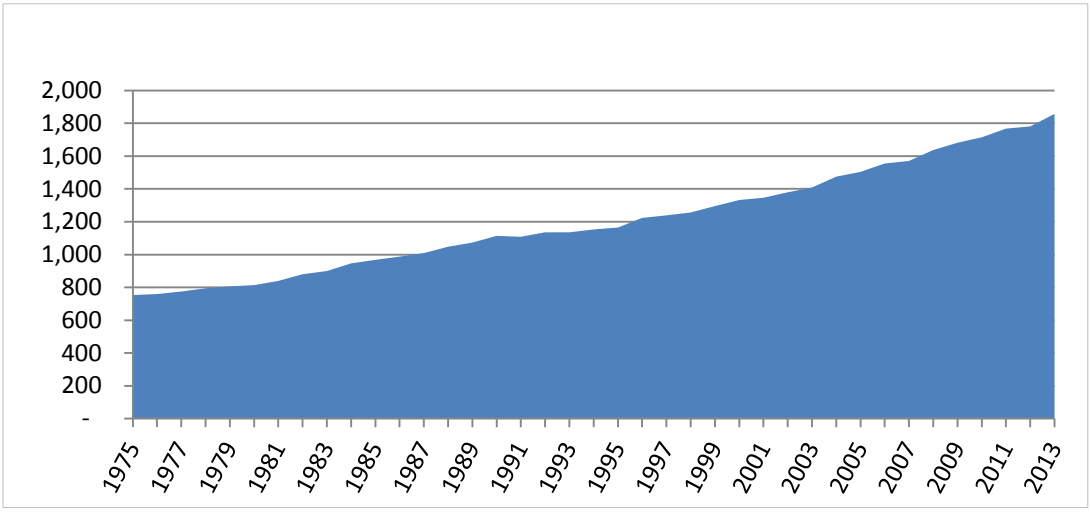
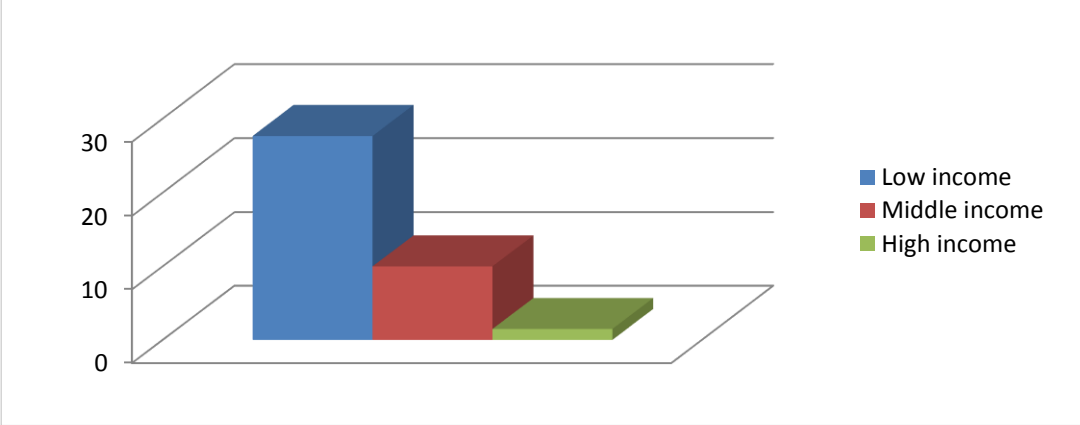
[1] The agricultural sector typically includes cultivation of food crops, fisheries and forestry. Where possible in this document, forestry is excluded from the analysis and statistics presented.
[2] The USD 2.2 million figure is current dollars. For this reason the graph, which is in 2005 dollars, seems to read less than this total.
[3] World Development Indicators, 2013 figures.
[4] Ibid.

Figure 1. Global Agricultural Value Added, USD billions ($2005)



Source: World Development Indicators

Figure 2. Agricultural value added as % of GDP, 2012



Source: World Development Indicators database

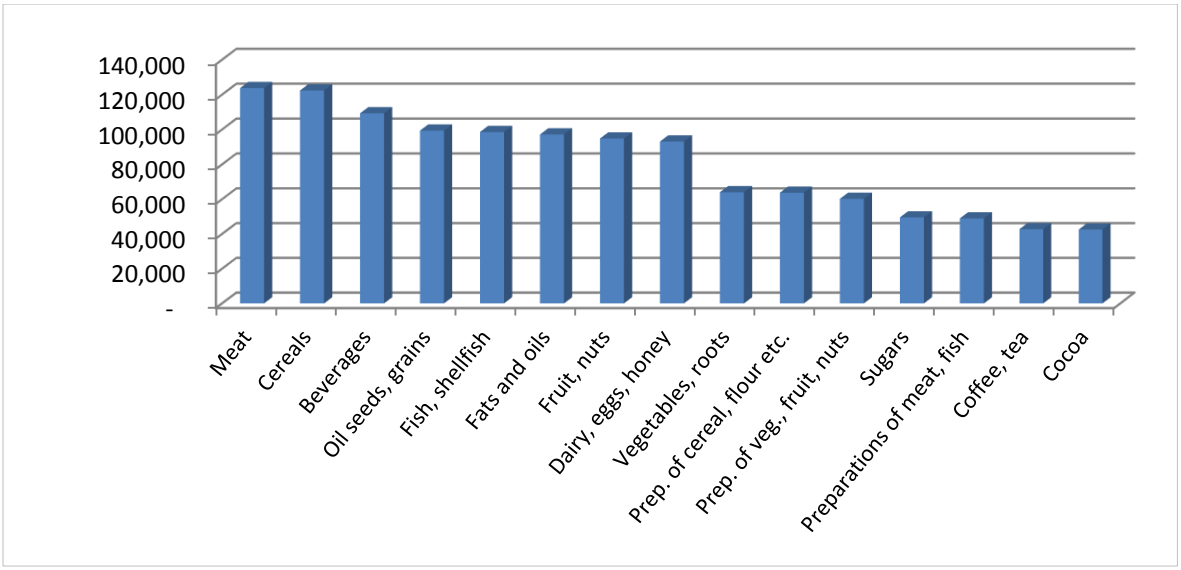
Agriculture's employment impacts are much larger than might be indicated by its share of GDP. Of the more than 3 billion people that live in rural areas globally, roughly 2.5 billion of those derive their livelihoods from agriculture, and globally that figure is roughly one-third of the world's population (Ibid). Those impacts are particularly important to the poor; for the more than 70% of the world's poor who live in rural areas, agriculture is the main source of income and employment (World Bank, n.d.). Exports are particularly important to some crops and countries; in 1999, in 28 developing countries, 3 or fewer agricultural export commodities accounted for over 40% of total merchandise exports (FAO 2002, Table 1). In fact, a single commodity accounted for more than 50% of total merchandise export earnings in four countries: Burundi (coffee, 75%), Niue (Taro, 71%), Sao Thomé and Principe (cocoa, 69%) and Ethiopia (coffee, 62%) (Ibid).

Most food consumed is produced domestically. Nonetheless, agriculture is a highly traded sector. Food exports in 2013, at over USD 1.5 trillion, stood at just under 9% of total global

merchandise trade (World Development Indicators), and trade flows of agricultural goods have increased fivefold in real terms over the last 50 years (FAO, 2014:150).

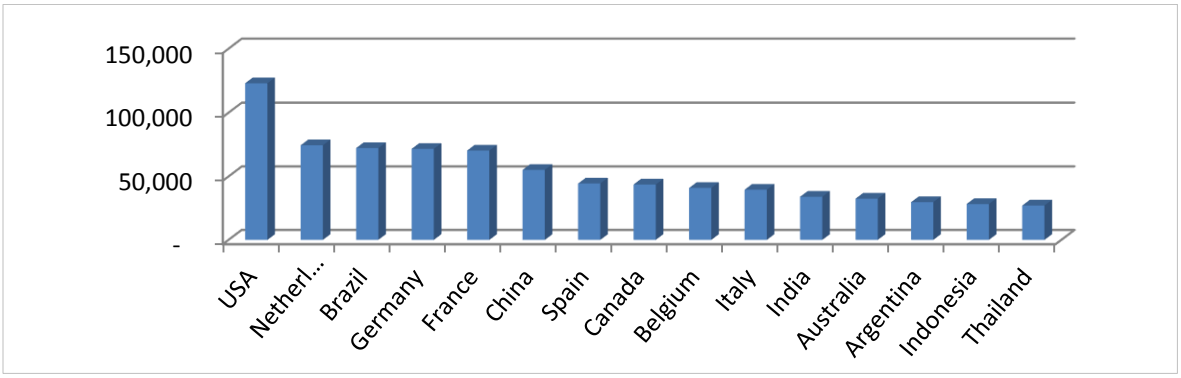
Figure 3 ranks the top 15 categories of food exports (by value) in 2013. Palm oil, which is covered in this paper, is a major component of the fats and oils group, ranked 6th largest in trade volumes. Cocoa, which is also covered, is ranked 15th. Figure 4 shows food export values for the top 15 global exporters for the same year, six of which are developing countries (namely Brazil, China, India, Argentina, Indonesia and Thailand).

Figure 3. Top Food Export, 2013 (USD millions)



Source: UN COMTRADE Database

Figure 4. Top Food Exporters, 2013 (USD millions)



Source: UN COMTRADE Database

Many emerging economies are increasingly successful in exporting higher value added agricultural products such as semi-processed foods. The global value of developing countries' fish exports – a relatively high value-added product – for example, now exceeds that of the more traditional commodity-like exports: coffee, tea, cocoa, bananas and sugar (Ibid, p. 154).

But the path to this sort of export success is not easy. FAO (2014:156) notes, in a passage that sets the context well for the present study:

> "The prospects for developing countries to benefit substantially from international trade depend on several complex factors. Increasing product differentiation, safety requirements and concerns about the carbon footprints of products are likely to bring about significant compliance costs for exporters. For developing countries, access to foreign markets may demand increased investments; and policies for promoting exports will need to look well beyond tariffs and subsidies towards the establishment of standards and producers' networks."

Food labelling initiatives touch precisely upon this need for increased product differentiation and higher standards, including the carbon content of food exports. That brings us to the climate impacts of the agricultural sector, discussed in the next section.

1.2. *Main climate impacts of the sector*

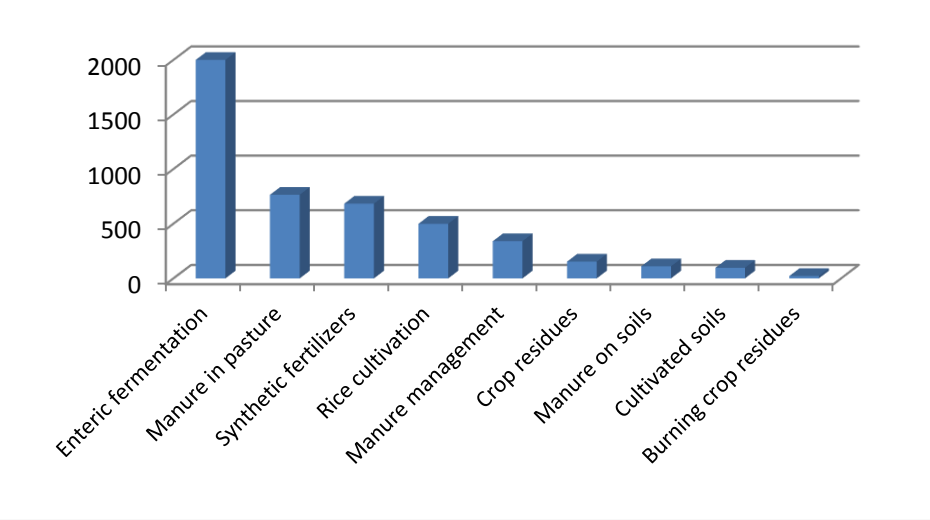
Agriculture is an important contributor to anthropogenic climate change. Estimates vary depending on assumptions about scope, but IPCC (2014) conservatively calculates the overall agricultural contribution to anthropogenic GHG emissions between 17% and 20%. This figure is made up of 10-12% non-CO_2 emissions, and 7.4% CO_2 emissions. FAO (2014:220) cites a larger figure, estimating agriculture is responsible for up to 30% of anthropogenic GHG emissions.

Figure 5 shows the major sources of agriculture-related non-CO_2 GHG emissions. These are chiefly emissions of methane, mostly through enteric fermentation and manure management, and N_2O, mostly from manure management and the production of synthetic fertiliser. Agriculture was the largest single producer of non-CO_2 emissions in 2005, at 56% (IPCC op. cit.).

Agriculture's CO_2 emissions derive primarily from deforestation and peat swamp conversion. Undisturbed waterlogged peat lands (also called organic soils) contain a large amount of carbon that is released into the atmosphere (along with some N_2O) when it is exposed to oxygen through drainage for agriculture. Emissions from this source amounted to 0.9 Gt of carbon dioxide equivalent (CO_2e)/year in 2010, with the largest share coming from Asia (0.44 $GtCO_2e$/year).[5] Deforestation is also a major source of CO_2 emissions, with emissions from land use change and forestry larger than those from all agriculture-related non-CO_2 sources combined, though it is difficult to separate out emissions associated with forestry from emissions associated with agriculture.

[5] FAOSTAT database.

Figure 5. Non-CO_2 GHG Agricultural Emissions



Source: FAO Statistical Yearbook 2013, Table 49

1.3. *Other impacts of the sector*

Agriculture also has other environmental impacts. MEA (2005) cites land clearing and conversion for agriculture as the single most important cause of biodiversity loss. Excess and run-off fertiliser from agriculture is also responsible for eutrophication of fresh water systems, and dead zones of oxygen-starved ocean water where rivers deposit large quantities of such run-off into the sea. Finally, the pesticides, herbicides and fungicides used in many agricultural models (primarily practised intensively in developed countries) may have deleterious effects on human health and the health of the ecosystems in which the crops are grown.

Organic production systems avoid these last two problems by prohibiting the use of synthetic fertilisers and chemical pesticides, fungicides and herbicides. Some organic standards also prohibit clearing of land of high biodiversity value for the express purpose of agricultural production.

As noted above, agriculture also has significant social and economic impacts, acting as it does as a major employer of low-income low-skill labour, especially in rural areas. It also provides food security for those same rural cultivators where food, as opposed to export crops, are grown.

2. Food Labelling

2.1. *Context*

This study focuses on one particular policy tool used in the agricultural sector as a way to achieve climate change objectives: food labelling, and specifically food labels for climate objectives.

Food labels are a subset of a larger group of policy tools known as ecolabels. These are tools to give the buyer of a labelled good information about the impacts inherent in the way the good is

produced, used and disposed of. Some focus on the entire life cycle of the labelled good, from extraction of the basic materials to final disposal. Others – for example, organic labels that cover only production – focus only on one particular phase. Those geared at conveying information on climate change for the most part focus on the CO_2 equivalent emissions released over the product's life cycle, or the *product carbon footprint*.

Ecolabels at one time were a niche market, but in recent years and in selected commodities they are becoming decidedly mainstream, assuming a growing segment of global markets. Potts et al. (2014) survey 16 global standards across 10 major commodities (8 of which are food and beverage) and estimate a global traded value of $31.6 billion in 2012. The global market share of standards-compliant products for some of these commodities is as high as 40%.

The point of such labels is to encourage environmentally friendly practices by using market forces – consumer preference – to favour goods with a lighter footprint. The labels examined here are varied in their scope, but all of them give the consumer some information that is relevant to the final product's impact on climate change.

The vast majority of ecolabels require that the producer obtains third party certification that its good meets the criteria established by the labelling regime. The certifier will typically be formally accredited by the regime to perform such certifications. The certified good is then allowed to display the regime's label on its packaging. Often, such schemes will involve regular (e.g., annual) recertification.

There are a number of variations on the basic theme of ecolabels. The most important defining distinction comes in answer to the question: why is the producer seeking certification and labelling? This might be because the label is a condition of sale, or it might be because the producer is seeking to distinguish the labelled good from other non-labelled goods.

2.1.1. Labels as a condition of sale

There are two types of scenarios under which the ecolabel is a condition of sale, and they can be distinguished by who is demanding the label. In the first scenario, the demanding party is a retailer that has pledged to sell only goods that are labelled. These might be simple pass/fail labels which, like the labels on organic food, simply tell the consumer whether the product is compliant with a standard. Or they might be labels that give the consumer a relative measure of how well the product stacks up against other goods in its class – a relative measurement label that, for example, tells the consumer that a given washing machine is in the 50^{th} percentile of all washing machines for energy efficiency, or tells the consumer how much carbon is embodied in a product, allowing for product-to-product comparisons.

B&Q, the world's fourth largest do-it-yourself retail chain, in 2011 attained 100% sourcing of Forest Stewardship Council (FSC) certified wood for all wood and wooden products (a pass/fail type label). Any producer wanting to sell its products to B&Q must, as a condition of sale, be able to show that the wood from which its products are made is FSC certified. There have been a number of attempts to elaborate relative measurement type labels, by retail giants like Tesco, Walmart and Carrefour; most of these were aimed at communicating the level of embodied carbon in a product.

One ill-fated example of such labels is food miles labels. In 2010 Tesco began labelling its produce with a tally of how many miles it had flown to get to the UK. Other retailers such as Marks and Spencer followed suit. But a storm of criticism followed the introduction of these labels (See, for example, Desrocher and Shimizu (2008); Zaino (2008); Muller (2007). MacGregor (2010)). Weber and Matthews (2008) found that transport emissions are only a small part of the total life cycle emissions associated with food at the point of purchase, with transport from producer to retailer averaging 4% of total embodied emissions over the life cycle. Ultimately, how a good is produced and stored is much more important from a climate change perspective than how far and by what mode it was transported to market (though air freight is much more emissions-intensive than shipping). No food miles labels exist today.

Summary on taxonomy of ecolabels

Labels as a condition of sale		
	Standard type	
	Pass/fail	*Relative*
Retailer specifies: product category X must be labelled	**B&Q (UK)**: All wood products must be FSC-certified **Walmart**: All own-brand food suppliers must certify to GlobalGap or other similar standard	**Tesco (discontinued)**: selected products must display carbon emissions per unit, using Carbon Trust label
Government specifies: product category X must be labelled	This policy would amount to a ban on products not meeting the standard, and labels for those that do. No such policies in place.	**Canada's EnerGuide**: selected consumer products must be labelled with rating on a spectrum of energy efficiency performance
Labels as a distinguishing feature		
Standard created by government or national standards body	National certified organic standards National ecolabel schemes (e.g., Nordic Swan, Singapore Green Label, German Blue Angel) **EnergyStar**: created by US Environmental Protection agency to label consumer goods	
Standard created by NGO or NGO/private consortium	**Marine Stewardship Council**: created by WWF and Unilever to certify sustainably harvested fish **Max Havelaar Foundation**: Fair trade label for agricultural products **Rainforest Alliance**: created by social activist founders to address deforestation	
Standard created by producers	**Bonsucro, Brazil**: sugar producers' standard of sustainable practice **RSPO**: initially created by palm oil producers	

The second scenario is a government labelling regime requiring that all products in a given class must be labelled in order to be sold in the domestic market. Again, the label might be either a pass/fail test, or a relative declaration of how the product fares against its competitors. The first type of label is a requirement that all products in a certain class should pass some standard, and be labelled as in compliance, in order to be sold in the domestic market. There are many examples of this sort of label in the area of safety standards for consumer products, but none exists in the area of food. An example of the second type of label is the Canadian EnerGuide label, which informs potential buyers of the energy efficiency of most major appliances, and shows how they perform relative to the range of such appliances on the market.[6] All covered appliances must be labelled to be sold in the Canadian retail market. In the area of food there are no such standards in place, although the report that followed France's environmental labelling pilot scheme recommended a broader scheme that would start as voluntary and would eventually transition to mandatory (Ernst & Young, n.d.).

2.1.2. *Labels as a distinguishing feature*

Many labelling regimes are not required as a condition of sale, but rather are used by producers to distinguish their goods from unlabelled goods which, presumably, have a worse environmental performance across the life cycle.

There are three major scenarios that distinguish labelling regimes of this sort, and they hinge on who is writing the rules of the label – who creates the standard?

Some schemes are the product of a governmental or inter-governmental standard setting body, or a body specifically mandated by a national government to produce the standard. An example of this latter type of scheme is the EU ecolabel, which producers voluntarily apply for so as to help boost their sales with eco-conscious consumers.[7] The British Standards Association (BSA) produced the PAS 2050 which describes standards for a suite of consumer goods (mostly foods) based on carbon content. Many national governments have mandated their standards setting bodies or agricultural ministries to create organic standards, and to accredit certifiers to the standard.

Others are the product of an independent effort by non-governmental organisations. The Rainforest Alliance, for example, is a non-governmental organization (NGO) devoted to halting rainforest destruction through market forces. It allows agricultural products (among other things) to bear its certified seal if they pass the requisite standards. The Marine Stewardship Council, which certifies sustainably harvested fish products, was originally a joint effort led by WWF in partnership with Unilever, created in response to the collapse of the North American Grand Banks cod fishery.

Others are largely spearheaded by a cooperative effort on the part of producers, seeking to assert that their products are credible as environmentally friendly (or at least more so than others in their product category). The Roundtable on Sustainable Palm Oil, for example, was

[6] For details see http://www.nrcan.gc.ca/energy/products/energuide/13592.
[7] For details see http://ec.europa.eu/environment/index_en.htm.

initially founded by producers seeking to counter negative publicity about their product, though it now involves a much wider range of actors along the supply chain.

Most ecolabelling regimes are voluntary schemes under which producers ultimately choose whether or not to be certified. There are presently very few examples of purely mandatory schemes, wherein governments condition market access on obtaining an ecolabel, and there are none at all in the food sector. That said, the distinction between voluntary and mandatory is not always clear cut. If a retailer demands the label as a condition of sale, is that mandatory or voluntary? It is true that the producer has the choice not to be labelled, and to sell to other buyers, so in that sense it is voluntary. But what if the retailer is a significant part of the global buying market? Similarly, does a voluntary government label become less voluntary if consumers overwhelmingly choose goods that are labelled over those that are not? This is a set of issues that will be discussed in greater depth later in this paper.

2.1.3. Labels, standards and WTO law

It should be noted that the voluntary/mandatory distinction is important from a legal perspective. Food labels and the standards on which they are based are covered under the WTO's Technical Barriers to Trade Agreement, and the legal obligations are quite different for voluntary and mandatory efforts.

While the distinctions are not always straightforward, one thing is clear: when a government decrees that a label, or certification to a standard, is a condition of sale in its domestic market, it is bound by the TBT Agreement to a number of procedural obligations, including obligations of transparency, technical assistance, and – importantly – the need to ensure that the standard is not more trade restrictive than necessary to achieve the legitimate objective at which it aims.[8] However, if the standard is a condition of sale to a private sector actor, it is not considered mandatory under WTO law, and is not covered by these obligations.

Voluntary standards are covered under an annex to the TBT: *The Code of Good Practice for the Preparation, Adoption and Application of Standards*. The Code is less onerous than the TBT Agreement's obligations for mandatory standards, and does not contain a not-more-trade-restrictive requirement, but does have procedural requirements that aim for best practice in standard-setting.

It is not, however, clear who exactly is covered by the Code. The Code is open for voluntary acceptance by practically any sort of standardizing body, and member governments must ensure that their central government standardizing bodies are in compliance, but beyond that it gets vague. The TBT requires that members "*shall take such reasonable measures as may be available to them to ensure that local government and non-governmental standardizing bodies within their territories, as well as regional standardizing bodies of which they or one or more bodies within their territories are members, accept and comply*" with the Code. But it is not clear

[8] In WTO terms such a standard is known as a *technical regulation*, while all other "less mandatory" regimes are known as standards. We will not use those terms in this discussion, since they are not so used in the rest of this paper.

what force governments might have to make international organizations such as Rainforest Alliance and the Forest Stewardship Council abide by TBT law, even if it were obvious in what country's territory they were based. As well, while it does seem clear that private retailers are not standardizing bodies within the definition offered by the TBT, there has been plenty of discussion within the WTO's Committee on Technical Barriers to Trade on whether and how such retailers might be subjected to the Code of Good Practice, given the significant impacts their practices can have on exporters.

2.2. *Why focus on food labels?*

There are many tools available to policy-makers looking to address climate change concerns in the agricultural sector, with food carbon labels being only one. Domingo et al. (2014) list other sorts of policies, including:

- Restrictions on land clearing, conversion;
- Regulations on treatment of animal waste (methane minimisation);
- Incentives, capacity building to alter practices (e.g., incentives for conservation agriculture (no-till), for altered livestock feed, for bio-gas capture, for leguminous plant cultivation & planting of cover crops, for crop switching, etc.);
- Reduced subsidies for GHG-related inputs such as fossil fuels, nitrogen fertiliser.

Food carbon labels, however, have a number of characteristics that make them a particularly appropriate focus for this study.

For one thing, labelling is a demand-side tool, unlike the supply-side tools described above. As such, its impacts are felt through altered patterns of consumption, meaning it will have direct impacts on international trade flows (where production is traded). Given the aim of this project – to look at international impacts of climate policies – this characteristic makes it an ideal focus for study.

Furthermore, the evidence is that food labels have a significant potential to influence consumer behaviour, with attendant significant impacts (both positive and negative). Food tends to make up a high percentage of consumer purchases, even in more affluent countries (INSEE 2011). And it is often the most frequently purchased item – bought on an almost daily basis, meaning frequent contact with labelling information. Moreover, demand for food is relatively inelastic, meaning that even when their income changes, people do not respond by changing significantly the amount they spend on food.

Food products are strongly represented in consumer labelling schemes, as well. Ecolabels tend to focus on goods for sale to final consumers, and a major portion of them tend to be food items. Potts et al (2014) surveys the state of 16 of the most widely used global voluntary sustainability standards, and the coverage is almost all food products: bananas, cocoa, coffee, palm oil, soy, sugar or tea. Only three commodities covered were not food items: cotton, forest products and biofuels. When BSA propounded its first set of standards on product carbon footprints, (PSA 2050), the coverage was similarly almost exclusively food items. Fully 70 of the 168 companies participating in the pilot for environmental labelling in France (under the Grenelle II from 2011 – 2012) were from the agri-food sector.

Moreover, survey results show that consumers are affected by labels. An EU study (Gallup, 2009) found that 47% of respondents claimed that ecolabels played an important role in their purchasing decisions, and fully 72% supported mandatory product carbon footprint labelling. Bolwig and Gibbon (2010) studies US and UK consumers and found that over half of them would rather do business with a company that was striving to reduce its carbon footprint, and almost two-thirds of UK consumers want companies to provide more information on their products' carbon footprints. Carbon Trust (2009) found that 67% of UK consumers buy lower carbon products, and 44% of them would switch to purchase a lower carbon product even if it were not otherwise their first choice. That said, most surveys find price to be more important than environmental qualities; Bolwig and Gibbon (op. cit.) found the environmental factors ranked third after price and quality in the minds of consumers, and found carbon footprint ranked third in the list of important environmental criteria.

That sort of response has seen food labels take on an increasingly important role in determining market share. From a niche segment of the market even a decade ago, food labels for some products have now developed into significant global segments of demand. Table 1 shows that the global market share of coffee conforming to voluntary sustainability standards rose from 15% in 2008 to 40% in 2012 – a compound annual growth rate of 28%. For cocoa, the corresponding figures were 3% to 22%, or a 65% compound annual increase. Standard-compliant palm oil rose from 2% of the global market to 15% – also a 65% annual increase. As noted above, Potts et al. (2014) survey 16 global standards across 10 major commodities and estimate a global traded value of $31.6 billion in 2012.

Table 1. Growth in global market share of labelled goods

	Market share 2008	Market share 2012	Increase in share	Annual growth rate
Coffee	15%	40%	167%	28%
Cocoa	3%	22%	633%	65%
Palm Oil	2%	15%	650%	65%
Tea	6%	12%	100%	19%
Bananas	2%	3%	50%	11%

Source: Potts et al., 2014

2.3. *The labels*

This study looks at three case studies of food labels with carbon relevance. They are:

- Cocoa labelling in Ghana (Rainforest Alliance, UTZ, organic and FairTrade labels)
- The Roundtable for Sustainable Palm Oil (RSPO) production
- The EU efforts toward product environmental footprinting

These three cases offer a good contextual diversity. The cocoa labels are all non-governmental voluntary standards aimed at distinguishing the goods in question. The RSPO is voluntary and was originally a producer-driven standard aimed at establishing credibility (Laurance et al., 2010). And the EU effort – which is a footprinting exercise that does not involve a label, but which constitutes the basis on which labels could be established – is government-driven, in collaboration with retailers and producers, with the possibility of becoming mandatory at some point in the future. All have, on the face of it, good potential for international impacts, and useful lessons on the broader impacts of climate-related measures.

2.3.1. Cocoa labels

This case looks specifically at cocoa labels used in Ghana. Framing the context within a specific country allows for a greater level of depth in the analysis. And Ghana as a choice of countries makes good sense, given the significance of cocoa to the national economy (see also the country case study on Ghana as part of this CEPS project).

After Côte d'Ivoire, Ghana is the world's second largest producer of cocoa, and is widely acknowledged to be the world's top producer in terms of quality. Cocoa is Ghana's chief agricultural export, and its main cash crop, with exports accounting for 11% of total merchandise exports in 2013,[9] and 3% of GDP (direct share).[10] Those statistics understate the contribution of the cocoa sector to the national economy, however; Laven (2010:23) estimates that ultimately the livelihoods of some 6.3 million Ghanaians (roughly one-third of the population) depend on cocoa.

The structure of production sees roughly a million producers, mostly smallholders, at the base of the value chain, often selling through producers' cooperatives (Laven and Boomsma, 2012:7). Potts et al. (2014) note that in Ghana only one percent of cocoa farms are larger than five hectares. Most producers are poor, with small plots of land (median size around 3 hectares, as per Bethge (2014:67)) and limited means to invest in improving the existing low productivity (Laven and Boomsma op. cit.). Interest rates to these producers – where they can obtain credit –is at crippling rates; Deppeler, Fromm and Aidoo (2014) found a mean rate of 82%, with more than half of respondents paying 100% per annum. Often credit is supplied in the form of lent inputs such as fertiliser, provided by buyers.

From those sellers the product is purchased by only a few buyers. Until 1992 the Ghana Cocoa Board (COCOBOD), was the only allowed buyer and exporter, controlling quality, prices and external marketing. More recently, Licensed Buying Companies (LBCs) have been allowed to purchase, and in some cases export, cocoa products, but price and quality are still set by COCOBOD. As of 2012 nine LBCs accounted for around 95% of the market (CEval, 2012). International buyers are similarly few, with almost 50% of the global confectionary market controlled by just five global firms (Kraft, Mars, Nestlé, Hershey's and Ferrero). And finally, from very few buyers/processors the product is sold as a commodity for further refinement, or a processed finished product, to a large number of retail-level buyers.

[9] UNCTAD COMTRADE database.
[10] Derived by author from Ibid, and World Bank World Development Indicators database.

Ghana's cocoa production is on average of very low productivity, with few or no inputs, and an ageing stock of trees. KPMG (2012) notes that low margins in turn tend to mean low ability to invest in upgrading of productivity. Producers tend to be older, with little or no education. The majority of cocoa growers produce roughly an equal value of food crops for personal consumption and cocoa for sale (CEval, op. cit.).

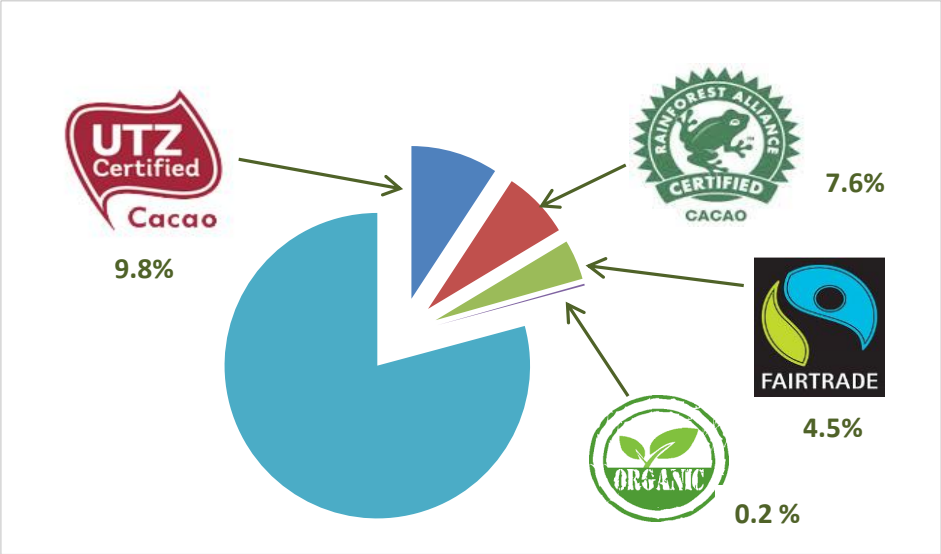
Until recently there had been a considerable shift in cultivated area from the southeast of Ghana to the west, to the so-called High Forest Zone (HFZ). This trend mostly consisted of the clearing of new land from the Western forests – a practice that producers found easier than investing in replanting when their trees became old, or increasing productivity on existing lands. The predominant mode of production in the HFZ has been extensive forest clearing, in what is known as low- or no-shade cocoa cultivation. This system of cultivation can deliver higher yields on a short-term basis, provided sufficient inputs of water and fertilizers, but in the absence of those inputs those higher yields are temporary, based on unsustainable use of the forest soil fertility. Given that most coca farmers are not using fertilizers, the final result is low productivity coupled with high rates of deforestation.

Clearly this had major implications for climate change and biodiversity. Conservation International (2008) estimated at that time that 1.3% of Ghana's remaining forests were being lost each year due to unsustainable cocoa cultivation. More recently this trend has been greatly diminished by well-enforced laws against forest encroachment, incentives for investment in productivity and better training in good agricultural practice (World Bank 2011). But as of 2014 a high-level group of technical experts from the forestry and cocoa sectors still identified encroachment of low/no shade cocoa systems and associated food crops into protected forests as one of the primary drivers of deforestation in Ghana (Government of Ghana, 2014).

There has been increasing attention to the goals of sustainability in the cocoa value chain. At the time of writing Mars Inc., Mondeléz International, Nestlé, Ferraro and Hershey (together comprising over 50% of the confectionary market) have pledged to source 100% certified sustainable cocoa by 2020.

A significant share of Ghana's cocoa crop is standards-compliant. As noted above, cocoa is one of the fastest growing commodities to be grown under global standards, with compound annual growth of over 25% between 2008 and 2012. In Ghana in 2011-2012, 16% of the total crop was compliant with one of the four standards covered here (see Figure 6). UTZ is the major player, followed by Rainforest Alliance, with FairTrade at a lesser rate and organic holding a very small market share.

Figure 6. Standard-compliant cocoa, Ghana (2011-2012)



Source: Potts et al.

The four schemes have very different criteria, as each aims at different objectives in practice, but each has some elements that mean they ultimately do address climate change to differing extents.

UTZ

UTZ publishes "Good Inside" codes of conduct for specific covered crops, and has a standard specific to cocoa. Version 1 (April 2009), which is the most up-to-date as of this writing, has seven chapters in areas such as social responsibility and product flow control, and 172 "control points", or criteria. Each chapter specifies how many of the criteria must be fulfilled, with the totals varying to allow incremental improvements over the first four years of certification.

The most significant impacts on climate change will come from UTZ's criteria related to chapter 3: Natural Resources and Biodiversity. Section 3.C (Forest and Biodiversity) contains the following two control points:

- **99.** Degradation and deforestation of primary forest is prohibited. There has been no such degradation and/or deforestation since 2008.
- **100.** There is no degradation or deforestation of forest that has not been used for agriculture in the past 20 years or more (i.e., that are older than 20 years), after initiating the certification process. This does not refer to timber plantations.

As noted above, agriculture's main impacts on climate change derive from deforestation and forest degradation. As such these criteria, which seek to reduce those pressures, are significant, especially in light of the sector's structure. Poor producers are unable to invest in productivity and rehabilitation, and World Bank (2011) notes that increased yields in Ghana have come almost exclusively from extensification of the growing area.

Rainforest Alliance

The Rainforest Alliance standard is maintained by the Sustainable Agriculture Network (SAN), a group that Rainforest Alliance helped establish. There is no specific cocoa standard, but rather a more general Sustainable Agricultural Standard (farm standard, version 3, July 2010). Certifiers are trained to decide which of the various criteria is applicable to the specific context in which they are working at any given time. Farms are certified at the level of whole operation, even if more than one crop is produced. The minimum score an operation must achieve to be certified is 80% of criteria successfully passed, and continuous improvement over time is expected.

SAN's Sustainable Agricultural Standard has 10 principles (e.g., Ecosystem Conservation, Fair Treatment and Good Working conditions for Workers, Integrated Crop Management, etc.), each of which is divided into numerous criteria. Sixteen of those are designated "critical criteria", meaning they must be successfully obtained regardless of the 80% score test.

The following criteria are those most relevant to climate change:

- **1.11:** The farm must do an annual inventory of energy used on farm by source and process. It must have an energy efficiency plan with goals for increased efficiency and reduced dependence on non-renewable sources. Use of on-farm energy sources is preferred.
- **2.2**. (critical criterion): From date of certification, the farm must not destroy any natural ecosystem. Additionally, if any high value ecosystem has been destroyed on the farm site since 2005, a number of mitigation measures must be undertaken.
- **2.4.** No harvest of trees on site unless in accordance with law and a sustainable management plan.
- **9.4**. Burning is not allowed as a method of land preparation.
- **9.5.** (critical criterion): The cutting of natural forest cover or burning to prepare new production areas is not permitted.

There is, in addition, a voluntary climate module to which SAN-certified operations can certify. It reinforces and expands the climate-related commitments undertaken in the normal farm-level SAN certification. The standard was formally approved in 2010, with Ghanaian cocoa used as one of the testing grounds for consultation. It focuses on both mitigation and adaptation. This standard is not yet widely used, and is not covered in the present analysis, but could in the future become a significant tool for achieving climate objectives.

Fairtrade

The Fairtrade Labelling Organization has product-specific standards for small producer organisations (SPOs), including one specific to cocoa.[11] The product-specific standards are complements to the more general SPO standard, and applicants must adhere to the requirements of both to gain certification.

[11] The version used in this analysis is 01.05.2011_v1.2. The next periodic review of this standard is expected some time in 2015, but was not ready at the time of writing.

The general standard outlines expected practices in four areas, including production and trade of the product. In each area there are a number of requirements that must be met, including various 'core' requirements. To be certified, SPOs must fulfil all the core requirements, and also gain a minimum score against the other requirements. That minimum is variable depending on the number of years in operation, with continuous improvement expected. The product-specific standard goes into more depth on such matters as pricing, contracts and credit, but not on any issues of particularly direct relevance to climate change.

The areas of the standard that are most relevant to climate change are:

- **3.2.33** Your members must avoid negative impacts on protected areas and in areas with high conservation value within or outside the farm or production areas from the date of application for certification. The areas that are used or converted to production of the Fairtrade crop must comply with national legislation in relation to agricultural land use.
- **3.2.39** In central processing facilities where non-renewable energy is used you must keep records of energy consumption, take measures to use energy more efficiently and replace non-renewable sources by renewable ones as far as possible.
- **3.2.40** You must report on practices that you or the members of your organization carry out to reduce GHG emissions and increase carbon sequestration.

Organic

There is no single organic standard, but rather a multiplicity of standards. Many countries have national-level standards propounded by their standard-setting bodies and certified by various private sector certifying agencies. There is also an international effort that brings together the various sub-global initiatives: the International Federation of Organic Agriculture Movements (IFOAM).

IFOAM itself produces three standards, or norms: one for objectives and requirements of any organic standard, one for accrediting certifiers of any organic standard, and one for organic production and processing (The IFOAM Standard for Organic Production and Processing, or hereinafter, the IFOAM Standard). IFOAM also accredits certifiers to its standards. Most national-level organic standards should comply with the IFOAM norms to have credibility, or to be good candidates for mutual recognition between different national standards. Ghana does not have a national set of organic standards, and the organic certified cocoa coming from Ghana tends to be certified according to the IFOAM Standard for production and processing.

The IFOAM Standard is structured as nine sections (crop production, processing and handling, etc.). Each section is populated with a number of requirements. There is no scoring system as with the other standards described above; any operation to be certified must follow all of the specified requirements.

There is only one requirement that is directly relevant to climate change in the IFOAM Standard, in the section: Organic Ecosystems:

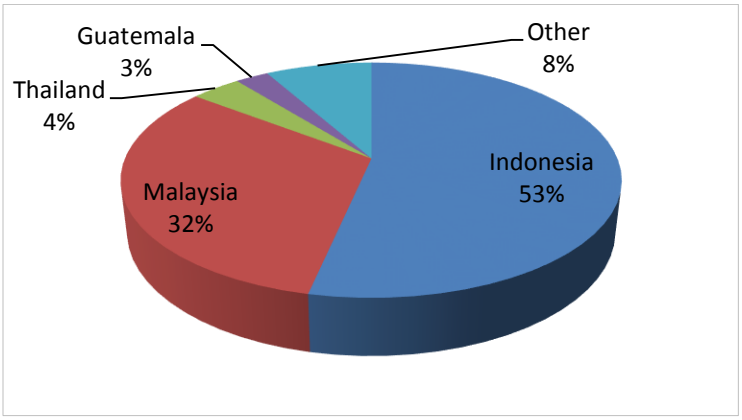
- 2.1.2 Clearing or destruction of High Conservation Value Areas is prohibited. Farming areas installed on land that has been obtained by clearing of High Conservation Value Areas in the preceding 5 years shall not be considered compliant with this standard.

A high conservation value area is: "An area that has been identified as having outstanding and critical importance due to is environmental, socioeconomic, biodiversity of landscape values." While there is not a perfect correspondence between such areas and those areas of importance from carbon stock perspective, there is also clearly some overlap.

2.3.2. The Roundtable on Sustainable Palm Oil

Palm oil is the most widely used vegetable oil in the world, constituting about one third of all vegetable oils used. It is used both for cooking and as an ingredient in processed foods, as well as finding use as a feedstock for biodiesel. It is one of the few vegetable fats that is semi-solid at room temperature, making it an ideal base while also being preferable on health grounds to hydrogenated oils.

Figure 7. Global Palm Oil Exports, 2013

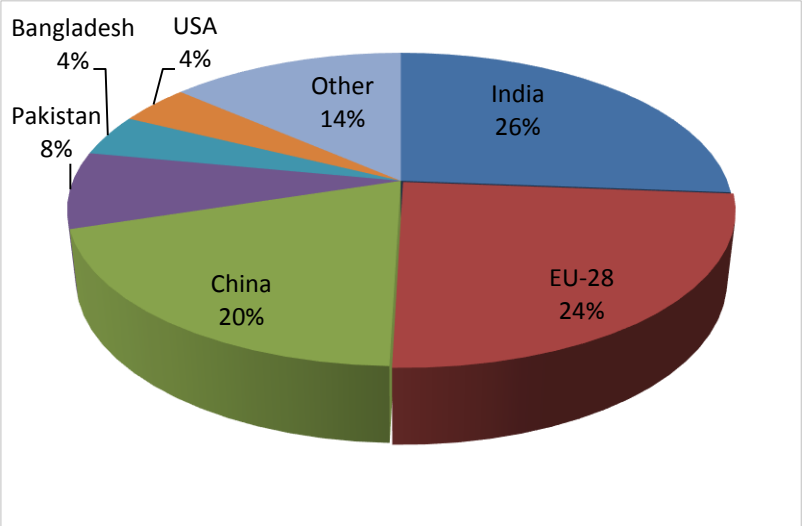


Source: UNCTAD COMTRADE Database (HS 151110 and 151190)

It is highly traded commodity, with global exports of crude and processed oil in 2013 totalling over $9.3 trillion.[12] Figure 7 shows the major exporters, of which Indonesia and Malaysia stand out as leaders with a combined global market share of over 86%.[13] Major importers are shown in Figure 8. Just under 60% of global imports are in India, China, Pakistan and Bangladesh, whose final consumers value palm oil as an inexpensive and versatile cooking oil, or a food processing agent. The next most significant importer is the EU-28 at 24% of global imports,[14] some 40% of which in 2012 was ultimately processed as biodiesel (Europe Economics, 2014). The remaining 60% was mostly destined to be used in food processing, though a small percentage is also used for soaps and cosmetics. Imports to the US (4% of global imports) are predominantly used as an input to food processing. Obidzinski (2013) reports that roughly half of production in Indonesia is exported as crude palm oil for further processing, while half is processed domestically and either exported as a processed good or consumed locally.

[12] UNCTAD COMTRADE database (HS 151110).
[13] Ibid.
[14] Ibid.

Figure 8. Major Palm Oil Importers (2013-14)



Source: Oil World (2015)

Acreage devoted to palm oil in Southeast Asia tripled in the space of the last decade, reaching a footprint of 16.4 million hectares in 2012 (Potts et al. 2014:238). Production is split between smallholder producers and large plantations, and involves an estimated 3 million smallholder producers (Ibid). In Indonesia in 2012 roughly 35% of production was from independent smallholders, and 50% is from large private multinationals on plantations (Indonesia Investments, n.d.). In Malaysia as of 2012 the large plantation model held 61% of production, with 14% independent smallholders and 25% smallholders organised by government agencies (Malaysian Palm Oil Board 2012 (cited in Mahat, 2012).

The next chapter discusses in some depth the nature of the environmental concerns with palm oil production, but essentially they boil down to the fact that much of the acreage devoted to palm oil in Malaysia and Indonesia is converted from peat swamps which, as noted in the previous chapter, has major implications for climate change. There is also concern that deforestation and conversion on these lands significantly reduces the habitat for a number of native endangered species.

As a result of those concerns, and facing potential consumer backlash against their products in the major OECD consuming countries, a small group of major producers and buyers of palm oil in 2004 spearheaded the Roundtable on Sustainable Palm Oil. Its objectives were to establish a process standard and a certification regime that would give environmental credibility to labelled palm oil, protecting the major advances in market share made by the product over the last two decades. A minor portion of palm oil production is also certified organic, and certified by Rainforest Alliance, but RSPO completely dominates the market for standards-compliant production. According to RSPO (2015), Certified Sustainable Palm Oil (CSPO) production increased roughly 25-fold from 619,000 tonnes in 2008 to 11.6 million tonnes in 2015. As of 2015, RSPO certified production constituted 20% of the total global market for palm oil, up from 2% in 2008 (Ibid, and Potts et al., 2014).

RSPO has grown from a relatively small group of major producers and buyers to a global multi-stakeholder operation, claiming more than 2,300 members including producers, processors, buyers, retailers, financiers and NGOs. Much of the impetus for the organisation's growth comes from the need to secure the EU markets for both food uses and biodiesel, as well as the smaller US markets, in both of which the industry hopes for continued growth. There is no significant demand for standard-compliant products in the major Asian consuming countries.

RSPO publishes a set of Principles and Criteria for Sustainable Palm Oil Production, to which members can certify using accredited third party certifiers. These consist of eight principles and numerous related criteria, all of which underwent a major revision in 2013. That revision brought more climate-related tests into the final document – the result of recommendations from the RSPO GHG Working Group. As discussed below, more work is ongoing to fully operationalise the revisions. Those aspects of the principles and criteria most relevant to climate change are:

- **5.4** Efficiency of fossil fuel use and the use of renewable energy is optimised.
    - Indicator: A plan for improving efficiency of the use of fossil fuels and to optimise renewable energy shall be in place and monitored.

- **5.5:** Use of fire for preparing land or replanting is avoided, except in specific situations as identified in the Association of Southeast Asian Nations (ASEAN) guidelines or other regional best practice.
    - Indicator: There shall be no land preparation by burning, other than in specific situations as identified in the 'Guidelines for the Implementation of the ASEAN Policy on Zero Burning' 2003, or comparable guidelines in other regions.
    - Indicator: Where fire has been used for preparing land for replanting, there shall be evidence of prior approval of the controlled burning as specified in 'Guidelines for the Implementation of the ASEAN Policy on Zero Burning' 2003, or comparable guidelines in other regions.

- **5.6:** Plans to reduce pollution and emissions, including greenhouse gases, are developed, implemented and monitored
    - Indicator: An assessment of all polluting activities shall be conducted, including gaseous emissions, particulate/soot emissions and effluent (see Criterion 4.4).
    - Indicator: Significant pollutants and GHG emissions shall be identified, and plans to reduce or minimise them implemented.
    - Indicator: A monitoring system shall be in place, with regular reporting on progress for these significant pollutants and emissions from estate and mill operations, using appropriate tools.

- **7.8:** New plantation developments are designed to minimise net greenhouse gas emissions.
    - Indicator: The carbon stock of the proposed development area and major potential sources of emissions that may result directly from the development shall be identified and estimated.

- Indicator: There shall be a plan to minimise net GHG emissions which takes into account avoidance of land areas with high carbon stocks and/or sequestration options.

- **8.1.1** The action plan for continual improvement shall be implemented, based on a consideration of the main social and environmental impacts and opportunities of the grower/mill, and shall include a range of Indicators covered by these Principles and Criteria. These include the following GHG-related indicators:
  - Environmental impacts (Criteria 4.3, 5.1 and 5.2);
  - Waste reduction (Criterion 5.3);
  - Pollution and greenhouse gas (GHG) emissions (Criteria 5.6 and 7.8);

2.3.3. EU Product Environmental Footprinting (PEF)

In 2010 the European Council (European Commission, 2010) invited the Commission to "develop a common methodology on the quantitative assessment of environmental impacts of products, throughout their life-cycle, in order to support the assessment and labelling of products."

After further study of existing methodologies for environmental footprinting of products and organisations, the EC in 2013 launched the initiative *Building the Single Market for Green Products*, which aimed to, among other things:

- Make it less confusing for consumers facing a barrage of differing 'green' claims;
- Make it easier for producers wishing to conform to green criteria, but facing different schemes in each different jurisdiction, and a variety of *sui generis* private sector schemes.

A central element of the initiative is a pilot phase of environmental footprinting of products and organisations, a pilot phase running from 2013 – 2016 in which a number of candidate products are assigned common methodologies for given product categories, common methods for verification, and common rules for communicating the results. During the pilot phase the methodologies for environmental footprinting are being road-tested by stakeholders in a voluntary process. The so-called first wave of pilots involved 14 product categories, mostly consumer goods and none of them food-related. The second wave of pilots started in June 2014 and involved the following 11 products, all food-related:

- Beer
- Coffee
- Fish
- Dairy products
- Feed
- Meat
- Pet food
- Olive oil
- Pasta
- Wine

- Bottled water

The stakeholders for each of these product categories are the leading food and beverage manufacturers and processors in Europe (some foreign firms are also involved – 12% of total stakeholders). Some 73% of the pilots have a majority of the relevant EU industry involved in the process, with 777 individual stakeholders from the 27 food and non-food pilots (Galatola, 2014).

At the end of the pilot in 2016 the EC will take stock. Recommendations at that time might be for further development of methodologies, or for wider application on a voluntary basis. They might also include a recommendation for the mandatory application of the environmental footprinting regime; this was one of the options explicitly evaluated in the Staff Working Document accompanying the *Communication from the Commission on Building a Single Market for Green Products* (EC 2013). The evaluation found that a mandatory regime would have positive environmental impacts, but did not rate highly on social or economic impacts. Further, it found that the mandatory option was strongly opposed by the stakeholders. Given that assessment, as well as the significant administrative and legal difficulties involved in implementing a mandatory regime, the final recommendation in the Staff Working Document was to apply the product and organisation environmental footprints on a voluntary basis. It therefore is unlikely – but of course still possible – that a mandatory regime would be the recommended option at the end of the pilot phase. It is hoped that the voluntary regime will offer national standard-setting bodies, producers and retailers a sort of 'rallying point' around which their individual efforts might coalesce.

The methodologies used to assess environmental footprints contain elements, among others, that assess the carbon emissions associated with the respective products along their life cycle. They build on similar methodologies in use in other contexts, such as the GHG Protocol, ISO 14064, PAS 2050.

While the environmental footprinting initiative is not billed as a labelling regime, it functions in much the same way as any such regime, assessing the environmental impacts across the life cycle, verifying the adherence to the established standards, and communicating the results.

The initiative builds on, and is complemented by, another similar initiative: the European Food Sustainable Consumption and Production Round Table's ENVIFOOD Protocol (SCP Round Table, 2013). The Round Table is composed mostly of European industry associations associated with the food sector: producers, processors, retailers. It also counts as members the Sustainability Consortium, the World Business Council for Sustainable Development, and the World Resources Institute. It is co-chaired by a Round Table member and the European Commission – an arrangement that should help ensure complementarity of efforts between their work and the EC Single Market for Green Products initiative.

The Protocol seeks to answer many of the same methodological questions being explored by the PEF exercise: what are the appropriate product categories? What is a representative product in each of those categories? What are the product category rules? In that sense it serves as an important contribution to the EC effort.

3. Impacts of food labelling

This section will consider the impacts of the surveyed regimes. The aim is to assess the impacts that would occur under a labelling scenario against a baseline scenario where no labelling regime existed. The relevant impact categories are split into economic, environmental and social. The scope of the analysis covers the impacts of the policy both where it is implemented (i.e., label host country) and in other jurisdictions (e.g., producer countries). Global impacts are also considered, as in the case of GHG emissions. For the most part the analysis focuses on the current impacts, but where relevant the impacts of trends and potential future developments are also considered.

The final result is a very broad set of possible impact categories, spread across many actors and jurisdictions. Ultimately the analysis is narrowed down to focus on those that are most significant given the objectives of the overall investigative effort: uncovering the wider (sustainable development) impacts of climate related policies, with a special focus on international impacts.

3.1. *Cocoa labelling in Ghana*

Of the three sub-cases studied in this paper, Ghanaian cocoa is by far the most thoroughly researched in terms of potential impacts of labelling. This is probably due at least in part to timing; the cocoa sustainability initiatives have been ongoing for decades whereas RSPO only formed in 2008 and the EU's PEF is still a work in progress.

As noted above, there are four active sustainability labelling schemes in Ghana for cocoa: Rainforest International, UTZ, Fairtrade and Organic. What follows is a survey of the literature on the types of impacts that have been found and attributed to the various schemes.

3.1.1. Economic impacts

In terms of trade impacts, the trend in shift from conventional to sustainably labelled cocoa is remarkable. As noted above, standard-compliant cocoa grew as a percentage of the global market from 3% in 2008 to 22% in 2012 – a 633% increase and an average compound annual growth of 65%.[15] The declaration by several of the major confectioners (comprising over 50% of the global buying market) that they will move to 100% sustainably sourced cocoa by 2020, as well as a similar declaration of intent by the Netherlands (Vernooij, 2010) (which processes a quarter of all cocoa globally) is driving rapid and fundamental change in this market.

The private standards surveyed here are technically voluntary (and the Dutch commitment is not a standard or regulation, but rather a declaration of intent to help stakeholders move toward the agreed objective). But, as was noted above, when a voluntary standard becomes mainstream, it begins to resemble a mandatory standard more closely – a condition of market access. Wouters and Garaets (2012) note that while private sector standards are by definition not mandatory, "the fact that a particular set of standards is used across the board in a certain

[15] The 22% figure (from Potts et al., 2014) accounts for a large amount of so-called double certification – certification to more than one standard.

sector may render the choice of individual producers or suppliers rather limited." Certainly by 2020 it will be difficult to find markets for non-labelled cocoa. At that point it may simply make sense for practically all production to be standard-compliant, whether eventually sold as such or not.

At that point, and to a lesser extent currently, the standards will act as significant trade restrictions. But this probably will not entail any major reshaping of global markets in terms of country market share. The major producing countries – Ghana and Côte d'Ivoire – are already well on their way to more widespread use of the various sustainability standards, and the final transition is far enough off that it will likely be implemented without major disruption. The buyers will probably help ensure a smooth transition to compliance through capacity building where necessary; several have already been involved in such efforts. As such the current producing countries will probably not lose market share.

That is not to say, however, that labelling does not have impacts at the producer level that will create new winners and losers; it does. The characteristics of the producers may change significantly (see discussion below). ITC (2013) and KPMG (2012) note that sustainability standards will tend to work against smaller producers, for at least two reasons. First, the fixed costs of certification and the inevitable restructuring of management systems are more easily borne by those producers with larger revenues over which to spread those costs. Second, buyers tend to prefer larger producers, and will buy from them in preference to smaller producers. This is because when the buyer is tasked with ensuring the sustainability of the supply chain, it is much simpler to do so with a smaller number of large producers. This is both a straightforward game of numbers – less is better – and also a matter of the tendency for smaller producers to be less educated and therefore harder to train in new practices.[16] This finding is consistent with findings in the broader literature on quality and safety standards.[17]

The final impact in a sector like cocoa in Ghana, which is heavily dominated by smallholder producers, may be profound. In some sectors these pressures have resulted in a change in the structure of the market, with a move to vertical integration under the control of the traders and processors (ITC 2013), but this has not yet happened in Ghana. Rather, virtually all efforts to date to certify producers have involved smallholders banding together in producers' cooperatives of some sort. These provide the institutional framework under which training and quality assurance is affordable for smallholders. The various producer groups of Ghana, established in the first instance in response to the demands of certification, have also innovated to be helpful to producers in a number of other ways, depending on their mandates:

Some provide credit to producers, who as noted above face extraordinarily high commercial rates where credit is even available. This often comes in the form of provided inputs such as fertilisers, pesticides, fungicides and seedlings – inputs whose costs can be repaid at the time of harvest.

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[16] Deppeler, Fromm and Aidoo (2014) note that illiterate producers have a higher tendency to drop out of certification programs under both UTZ and Rainforest Alliance regimes, and speculates that it is because the training is too difficult for them, relative to literate producers.

[17] In the context of agricultural product standards, for example, see Ferro, Wilson and Otsuki (2013).

All provide in-depth training on good agricultural practices, usually focused on the requirements of the standard to which they are aiming.

Most administer the premiums paid by buyers, with some dedicating a portion to community projects such as corn mills, clinics, schools, etc. The remainder is typically split between direct payment to farmers and the costs of certification.

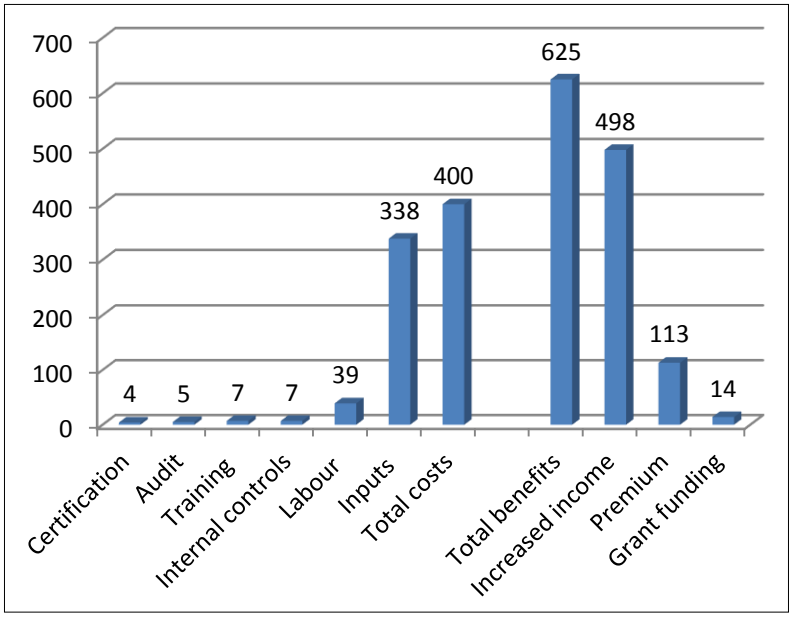
Ultimately, many of the effects of smallholders coming together in cooperatives can be regarded as positive economic effects of the standards examined here. Better access to credit and inputs was highlighted by KPMG (2012) in its assessment of Ghanaian cocoa standards. Bethge (2014) cites better access to inputs as one of the main reasons producers join Rainforest Alliance-focused cooperatives (although CEval [2012] found no difference in access to credit between the target and control groups in his study of the Fairtrade standard). Deppeler, Fromm and Aidoo (2014) found that training was the most valued aspect of the certification regimes for his respondents.

Most studies found an increase in yields as a result of certification – a finding they attribute to the training in good agricultural practices such as proper use of chemical inputs, proper composting and fermentation techniques, etc. (See COSA/ISSER (2013); KPMG (2012); Depeller, Fromm and Aidoo (2014), Bethge (2014); Waarts et al (2013)). Bethge (op. cit.) found average productivity in Rainforest Alliance certified operations at 3.67 bags per hectare vs. 1.53 bags per hectare at the uncertified control groups. Those surveyed by Bethge (op. cit.) cite this improved farm management as the main benefit of certification, and for most the increased income available from increased yields is more significant than the income from premiums (Osei, 2015; also see Figure 9).

The increase in income is a consistent finding across all studies, though the incidence varies (See CEval (2012); COSA/ISSER (2013)). It is in part a function of increased productivity, and in part a function of the premiums from certification. It has also been suggested that certification increases incomes by strengthening the producers' negotiating positions.[18] The costs of certification vary from scheme to scheme, but overall costs of certification tend to be less than the gains from certification. KPMG (2012) performed a cost-benefit analysis of Rainforest Alliance, Fairtrade and UTZ certification in Ghana and Côte d'Ivoire and found that while costs of certification (including increased inputs, audit costs, labour costs) averaged $400/ton of cocoa, benefits averaged $625/ton, for a net return of $225/ton (see Figure 9).

[18] Argument ascribed to Fairtrade officials in KPMG (2012:fn 53). See also Ryan (2011).

Figure 9. Costs and Benefits of Certification (USD/ton of cocoa)



Source: KPMG (2012). Based on averages for Rainforest Alliance, Fairtrade, UTZ, in Côte d'Ivoire and Ghana, 6-year period

A number of surveys of Ghanaian producers also point to a less obvious potential economic benefit of certification: the producers have greater certainty that they are not being cheated when they sell through their cooperatives and associations (See Schweisguth (2015); Nelson et al (2013)). Apparently they do not feel as confident about their dealings one-on-one with the LBCs.

Deppeler, Fromm and Aidoo (2014) note that the premiums and training, which constitute the bulk of the benefits of certification, do not necessarily accrue to hired labourers. In their surveys, 82% of respondents used hired labour at some point on the farms, though many of these would be just pulling in occasional labour for jobs such as spraying. Others, though, own land but do not work it – the shareholder model. Where this is the case, the benefits discussed above seldom actually reach the labourers.

3.1.2. Social impacts

There are a number of different types of social impacts associated with the labels surveyed, most of which are associated with the coming together of smallholders in cooperatives and associations to manage the requirements of certification.

The extensive training referenced above, all surveys found, makes Ghanaian farmers more productive, improving their capacity to provide for themselves and their families. This is a lifelong improvement that is not tied to the label after it has been effected.

Training is also important from a human health perspective. COSA/ISSER (2103), CEval (2012), and Bethge (2014) all found that trained producers were more likely to wear proper protective gear when applying toxic chemicals such as pesticides and fungicides, and more likely to use

appropriate doses when applying. The result is less exposure to potentially harmful compounds. COSA/ISSER (2013) also found significantly fewer farm injuries in the studied groups than in the control groups.

There may also be positive gender impacts. CEval (2012) found that the Ghanaian Fairtrade groups he studied provided useful training for women not only in farming techniques but also in basic finances and alternative livelihoods. Bethge (2014) and ITC (2013) also found positive effects for women – Bethge in Ghanaian Rainforest Alliance schemes and ITC as a more general proposition.

Bethge (2014) and CEval (2012) observe that the producers' organisations (particularly those striving for a Fairtrade label) may devote a percentage of the label premium toward community projects. Several studies found that corn mills had been purchased for public use, for example. In one case a mobile clinic was created (CEval 2012). Such spending should provide social benefits. CEval (2012), however, found that in some cases the mechanism for deciding which projects to undertake was not transparent, and many producers did not even know that their premiums were being directed to such spending. He notes that, as a result, some such projects had little local buy-in and had fallen into disrepair.

One of the initial drivers for labelling in the cocoa sector was the use of child labour in West African plantations (Oxfam, 2002). Child labour is a broad term that can describe anything from participation in family farm activities to abusive quasi-slavery arrangements, from labour under safe conditions to perilous activities with lack of safety equipment and training. It is difficult to distinguish the various types of child labour in the impact literature, but overall child labour seems to have declined in labelled operations. COSA/ISSER (2013), for example, finds that while child labour declined in the studied operations from 2010 to 2012, it declined by significantly more in the target (UTZ labelled) groups than in the control groups.

3.1.3. Environmental impacts

From a climate change perspective, the key indicator for environmental impacts is the amount of forested land cleared for production. As noted above, until recently Ghana had been steadily losing virgin forest to cocoa in the West for some years – a trend that has now slowed.

There are very few assessments of these sorts of impacts from labelling schemes in Ghana's cocoa sector. COSA/ISSER (2013) found that between 2010 and 2012 there had been a drop in the percentage of all farmers clearing natural areas for cocoa cultivation, but that the drop among UTZ-certified farmers (of more than 50%) was significantly greater than the drop among the non-certified control group. In neighbouring Côte d'Ivoire, COSA (n.d.) found that 43% of Rainforest Alliance certified producers had adopted at least one soil conservation measure (such as protecting shade trees), whereas only 5% of non-certified producers had done so. Given the criteria inherent in both standards, we would expect that certification would have impacts on the amount of new land cleared, and therefore the amount of GHGs emitted, but the hard evidence of such impacts is scarce.

The biodiversity impacts of sustainability standards for cocoa in Ghana is closely aligned with the GHG impacts, dependent at least in part on farming practices that avoid clearing of new land for

cultivation. There are other aspects of the standards that also impact biodiversity, such as the requirement under Rainforest Alliance for the use of shade tree cultivation (as opposed to full sun cultivation), and the use of indigenous species of trees. Tondoh et al. (2015) assess full sun cultivation and describe in detail the significant negative consequences for biodiversity in Côte d'Ivoire, as well as the negative impacts on soil quality – findings that are applicable to Ghana.

Gockowski and Sonwa (2010) survey the extensive increase in acreage of cocoa cultivation in the Guinea Rainforest (covering Ghana, Côte d'Ivoire, Nigeria and Cameroon) between 1988 and 2007 when production doubled, primarily via conversion of forests. They calculate that the same increase in production could have taken place with "little or no increase in the area harvested through increased applications of fertilizers and agrochemicals. (Ibid:317)" Such a productivity-led increase in production, they estimate, would have reduced the attendant CO_2 emissions over that period by 1.37 billion tons. There is some disagreement in the literature over whether this intensive "land-sparing" model is preferable to an extensive model that incorporates shade cover and improved techniques (Wade et al., 2010) –also known as "wildlife-friendly farming"— but there is no dispute as to the central proposition: that improved techniques are the key to reducing carbon emissions and preserving biodiversity, and that the potential savings are globally significant. To the extent that certification in Ghana leads to the sort of improvements described above, then it will contribute to preserving biodiversity and reducing GHG emissions (though nobody yet has tried to quantify that contribution).

The Government of Ghana (2014), in an Emission Reduction Program Idea Note (ER-PIN) submitted to the World Bank's Forest Carbon Partnership Facility, has proposed an emission reduction program for the cocoa forest mosaic landscape (Cocoa Forest REDD+ Program) that recognizes clearly the climate-related contributions being made by certification schemes in country. It specifically identifies the efforts of Solidaridad (implementing the UTZ standard) and the Rainforest Alliance as partners in the program, and describes those efforts as ongoing implementation of some of the program's cocoa oriented activities. As such it sees both regimes as an important part of its strategy to reduce emissions and deforestation. The ER-PIN notes, however, that the schemes in and of themselves are not sufficient – that an integrated landscape approach is needed to effect change at any significant scale.

It was noted above that the training provided by cooperatives or buyers' organisations was helpful in prescribing the proper use of pesticides and fungicides. As well as the health benefits described above, the proper usage can have environmental benefits, if it prevents farmers from over-using these chemical inputs, or instructs them on alternatives such as composting as a way to boost soil nutrients. Both Bethge (2014) and CEval (2012) found this to be the case in the farms they surveyed, which were focused on certification by Rainforest Alliance and Fairtrade, respectively.

As a general proposition, UTZ-certified farmers surveyed by COSA/ISSER (2013) self-declared as taking "good" care of the environment significantly more than did the control group (72% vs. 56%). And far fewer of them characterised their current practice as "bad" for the environment (4% vs. 10%).

3.2. *RSPO (Palm Oil)*

The impacts of certification under the RSPO standard are not as extensively researched as is the case for certified cocoa. In part this is because the standard is relatively recent, and only in the last few years has begun to attain anything like critical mass in the global markets. Cocoa (along with coffee) was one of the original commodities to be the focus of sustainability certification efforts.

3.2.1. Economic impacts

Arguably the most important economic impact of the RSPO – and in fact its key objective from its inception – has been the preservation of market share for palm oil in the face of negative public views of the supply chain. Mahat (2012) shows that palm oil has experienced a spectacular rise in global market share, stealing existing markets from soybean oil and rapeseed oil – its most important competitors – to become the most widely traded vegetable oil in relatively few years. As noted above, acreage devoted to palm oil cultivation has tripled in the last decade.

But palm oil's future prospects for continued growth were and are threatened by consumer concerns about its impacts on climate change and biodiversity. These were fuelled in part by the non-food imports in the EU, which were benefiting from the EU's Renewable Energy Directive (2009/28/EC) and Fuel Quality Directive (2009/30/EC). The former mandates that 10% of all transport fuels in EU member states should come from renewable sources by 2020, and the latter mandates that the carbon-intensity of EU transport fuel should be reduced by 6% by 2020. On the face of it this would seem to heavily drive demand for biofuels, but there was strong concern that these regulations, propelled by concern for climate change, might end up supporting modes of biofuel production that were highly GHG-intensive (such as peat forest clearing for plantations), and damaging of biodiversity as well. In response, the EU laid down sustainability criteria that any fuel would have to meet in order to count toward a member state's renewable energy mandate. These criteria rule out production of biofuels on land converted from high carbon stocks (such as primary forests, peat swamps), or from land with high biodiversity value. These regulations do not directly affect palm oil food imports, but the campaigns that preceded them managed to bring some serious concerns to public attention. There have also been concerns raised about the treatment of workers on major plantations.

A number of influential North American and European NGOs waged campaigns to raise consumer awareness about these issues, and targeted individual buyers and traders in strategic interventions designed to bring maximum pressure to bear. The results have been impressive. Table 2 lists some of the large global buyers and processors that have pledged to source certified sustainable palm oil (CSPO) to varying degrees of stringency – all within the last five years. As GIZ (2011:4) puts it: "Sustainability certification paves the way for access to international markets." The World Bank (2011:23) concurs: "As the palm oil industry moves toward certified sustainable palm oil production according to the standards set by the RSPO and other organizations, smallholders risk losing market share if they do not improve production practices to meet the stringent certification requirements."

Table 2. Commitments to CSPO

Company	Date	Commitment level
Nestlé	current	strong
Unilever	current	medium/strong
Danone	current	strong
Ferrero	current	strong
Mars Inc.	current	strong
Hershey's	current	medium/strong
Sainsbury's	2015	medium/strong
Starbucks	2015	medium/strong
MacDonald's	2015	medium/strong
Mondeléz	2015	medium/strong
Kellogg's	2015	strong
General Mills	2015	medium
ConAgra Foods	2015	strong
Kao Corp (Japan)	ongoing	medium/strong
Safeway-Albertson's	2016	medium/strong
Yum! Brands	2017	medium
Heinz	2023	medium/weak

Source: Author's compilation from company statements

At the same time, this effect should not be overstated. The only buyers of note that are presently concerned about sustainability are North American and European, and those markets have a combined share of global imports of only 28% (Oil World 2015). These may be potential growth markets, and in the near term they will be practically inaccessible for non-certified palm oil, but there still remains the other 72% of the global market, which is much less concerned with how the commodity was produced.

However, even the Asian markets may ultimately be *demandeurs* for CSPO, whether because their fledgling environmental NGOs manage to sway public opinion, or because the standard comes to signify quality production as much as it does environmental and social responsibility. Certainly the RSPO's more than 2,300 members are not just thinking of the current 28%. WWF (2012) quoted several respondents that believed their markets in Asia would eventually demand

CSPO. It is worth noting that in just six years, between 2008 and 2014, global market share for CSPO grew from 2% to 20%.[19] Those rates of growth testify to the strength of both consumer demand and supplier concern for market share.

They may also point to demand from financiers. The World Bank, for example, suspended loans to the palm oil sector in 2009 pending a review that led to a new framework and International Finance Corporation (IFC) strategy for supporting the sector. Among other things under the new strategy, adopted in 2011, the IFC does not lend to operations that convert peat swamp, and it required all producers to become certified sustainable within three years in order to qualify for support (World Bank, 2011). A number of commercial financiers are also demanding the security of RSPO certification as a lending condition, even if the product is not destined for the US or EU markets. In some cases this is a means to insulate unrelated branches of the borrower's operations from consumer backlash in those markets, and in some cases certification is seen as signalling an important 'license to operate' in geopolitically unstable locations.

An obvious benefit to certification is the premium received for CSPO. WWF (2012) found premiums ranging from zero to $30 per tonne of RSPO certified palm oil. RSPO's Green Palm system allows producers to receive a credit for their certified production, which can then be sold to any participant in the value chain – not just the immediate buyer. This is the least stringent form of labelling. Premiums tend to be higher (up to $50/tonne) for sustainable oil that has been physically separated the unsustainable product, or which allows any given shipment to be traced back to its origin.

As in the cocoa sector, a critically important long-term impact of certification is quality improvement, as producers are forced to implement good practices of production, harvest, handling and management. WWF (2012), in an analysis that attempts to quantify the costs and benefits of certification to the producers, finds this benefit to clearly outweigh the benefits inherent in the premium for certification. Rather than give average figures for productivity gains, the study offers ranges, based on the very different experience of the different producers surveyed. The study found that smallholders had the most to gain, some of them never even having recorded their yields before they were required to by RSPO, and several finding and resolving costly corruption issues once they implemented more rigorous management. One smallholder firm reported an increase of 186% in production per hectare after certifying.

WWF (2012) also found efficiency improvements at large plantations and within the mills. Another significant benefit to the larger operators was a formalised protocol for community engagement (as well as the ability to reference company good practice under RSPO). They calculate that a single four-day shut-down of operations due to social disruptions at any point during the life of a typical plant's operations exceeds $1 million in costs. Even without considering the other potential benefits of certification this far exceeds the cost of RSPO. One operation invested $30,000 in the early stages of land acquisition, and suggests that it might have averted costs associated with community disputes that, during its previous acquisition, totalled $15 million.

[19] 2008 figure: Potts et al. (2014). 2014 figure: RSPO (2015).

As in the case of cocoa, smallholders need training and capacity building to understand and comply with the new standards, and such assistance almost always goes through producer cooperatives. Training is needed both as an initial proposition and as an ongoing effort. Most often the funds for this come from some combination of the estate/buyer and the smallholders themselves, with foreign donors sometimes also contributing.

A potential negative economic impact of RSPO is increased food insecurity for consumers of palm oil, particularly those in South- and South-East Asia. World Growth (2010) argues that any requirements that limit the land on which palm oil production can expand will necessarily limit supply. This, they contend, would increase prices by the simple laws of supply and demand, and would increase costs for those that rely on palm oil as a cooking oil or food additive.

It is certainly true that Asian consumers of palm oil are benefiting from its low price relative to its competitors. In the five-year period between 2010 and 2015 palm oil prices have averaged 18.6% lower than the average of rapeseed oil and soybean oil prices, ranging from 7.1% to a gap of 37.4%.[20] It is also true that the main importers of palm oil also have significant numbers of the world's hungry, for whom any price increases would be significant (see Figure 10).

Figure 10: Palm oil imports and hunger

	Palm oil imports (1000 T)	Share of Global Imports	Malnourished (million)	Share of Global Hungry
India	7,839	26%	194.6	24%
China	5,888	20%	133.8	17%
Pakistan	2,361	8%	41.4	5%
Bangladesh	1,284	4%	26.3	3%
Totals		82%		50

Source: Oil World, 2015, FAO, 2015

USDA (2011) makes the same point, noting the lack of room to expand in Malaysia and the potential environmental obstacles to expansion in Indonesia:

> "With intense pressure being brought to bear on the Indonesian government to halt or slow its own oil palm plantation expansion owing to international environmental and greenhouse gas concerns, the prospect of stagnating Malaysian production substantially increases the likelihood of sustained high prices in the edible oil market. Since palm oil is the world's cheapest edible oil, it has become the primary cooking oil for the majority of people in the developing world of Asia, Africa, and the Middle East. The consumer base in these regions is large, growing, poor, and highly price-sensitive. Given there are currently no viable and affordable alternatives to palm oil for most of these consumers, any significant reduction in

[20] Figures derived from data found at IndexMundi for commodity prices: palm oil, rapeseed oil and soybean oil (July 2010 – July 2015).

the growth rate of Malaysian production will make it difficult for them to increase the use of edible oils in their diets."

Of course, this impact may well be offset by productivity increases as a result of certification. And it is not clear what the actual price impacts might be. Brahmbhatt and Christiaensen (2008) note that cooking oil constitutes just over 5% of daily calorific intake for the average East Asian household, giving us a very rough indication that it may not be a particularly significant portion of household expenditures. While *any* increase is significant for the poor of Asia, this particular increase might not be out of line with normal fluctuations in prices of foodstuffs.

Another potential negative impact of certification is the classic standards effect: it is disproportionately difficult for small and medium-sized enterprises to meet the RSPO requirements (WWF 2012). As noted above, the palm oil sector is divided between plantation-style operators and smallholders, with the latter being either organised in contracted cooperatives, or independent. GIZ (2011) estimates the percentage of smallholder acreage in Indonesia to be 44%, with the corresponding figures in Malaysia and Thailand at 30% and 80%. The costs of certification, if not supported, can be expected to hasten a model where the smallholder producers are replaced by vertically integrated operations. Those smallholder operations, however, were a deliberate result of extensive efforts by both the Malaysian and Indonesian governments' intent on rural development and poverty alleviation (Mahat 2012).

3.2.2. Social impacts

The key social impacts of RSPO certification are fundamentally linked to the economic impacts discussed above. For example, the maintenance of market access for palm oil is a major benefit to the many rural poor employed and self-employed in the sector. Palm oil is a particularly labour-intensive crop, and creates many more jobs than its closest substitutes; WWF (2012) notes that while palm oil requires an average of 5 workers per hectare, soybean oil and rapeseed oil – both predominantly produced under capital-intensive systems – often require as little as one worker per 100 hectares. As such, maintenance of market share for palm oil has important livelihood and poverty alleviation impacts, to the extent that it can be linked to RSPO certification.

The disproportionate costs for smallholders are also of interest. If indeed they represent a disincentive for the smallholder model and an advantage for the vertically integrated model, then as the standard becomes more mainstream many self-employed producers will become sharecroppers or wage labourers. Final impacts on wellbeing would be complex to predict in such a scenario, but it is fair to assume that most existing smallholders prefer their current arrangements (if not, they would change them autonomously).

Food security is also a pressing social impact. If widespread adoption of the RSPO standard causes price increases for palm oil then the impacts on poor Asian consumers will be negative. It was noted above that this effect is difficult to quantify, and may be less significant than argued by, for example, World Growth (2010). But it is nonetheless an important and undesirable side effect of certification.

3.2.3. Environmental impacts

The environmental impacts of RSPO revolve primarily around the strictures that the standard places on the clearing of new land for cultivation, and in particular the clearing of peat swamp land. There are other environmental impacts as well, as discussed below but, to be clear, they are of a different order of magnitude.

The environmental elements in RSPO's 2013 revised principles and criteria as described in Section 2.3.2 above. The 2013 revision, after much discussion, saw a number of new GHG-related elements added in response to recommendations from the RSPO's GHG Working Group. The principle most relevant to peat swamp clearing is the new principle 7.8: "New plantation developments are designed to minimise net greenhouse gas emissions." In practice this means identifying and reporting all significant GHG emissions from new planting, and having a plan to avoid or mitigate major emissions. The guidance for the plan includes the following: "Growers are strongly encouraged to establish new plantings on mineral soils, in low carbon stock areas, and cultivated areas, which the current users are willing to develop into oil palm." This is not as strong as an outright prohibition, but it squarely addresses the most controversial and significant environmental impact of palm oil cultivation.

The principle is, however, subject to the caveat that the methodologies for projecting the relevant emissions are not yet adequate. There will be an implementation period in which growers and millers will promote best practice reporting, using the RSPO's PalmGHG tool among others, and as of 2017 they commit to public reporting and planning.

Given that the principle is not yet fully in force, it is difficult to estimate what sort of environmental impacts it might have had. It is possible, however, to roughly estimate what this principle would mean if it were in force and faithfully implemented. For the sake of this calculation we use Indonesia only, since it is there that the bulk of any major expansion of peat swamp clearing would have to take place. Margono et al., (2014) identified a loss of primary forest in Indonesia at a rate of 820,000 ha/year in 2011 and 2012.[21] They calculate that 43% of that (or 353,000 ha) was peat swamp, and the rest was mineral soil forests. Koh et al (2011) estimated the volume of GHG emissions from peat swamp clearance as follows:

- Above-ground emissions = 155.5 ± 39.2 mg/ha
- Below-ground emissions = 5.2 ± 1.1 mg/ha
- Emissions from lost carbon sequestration (annually) = 0.75 ± 0.25 mg/ha

If we disregard the margins of error, and ignore the compounding inherent in annual contributions from lost sequestration services, we arrive at a figure of 160.95 mg/ha. Applying this to the 2012 figure for peat swamp clearance cited by Margono et al (2014) gives us an annual figure of 56.8 million tonnes of CO_2e. To put this into perspective, if Principle 7.8 of the

[21] These figures are, it is worth noting, for a time period most of which is *after* the 2011 Indonesian moratorium on new clearing for palm oil. For details on the moratorium see Austin, Sheppard and Stolle (2012).

RSPO principles and criteria had been followed strictly in Indonesia in 2012, it would have saved the equivalent of 7.5% of Indonesia's GHG emissions in that year.[22]

This figure represents the estimated amount of emissions that would be reduced if the RSPO guidance were followed strictly and universally. It is based on Indonesian figures only (though for good reason) and it excludes the emissions from clearing of mineral soil forests (which constituted 57% of primary forest clearance) and degraded forest areas. As such it is useful as a notional figure – one that demonstrates the potential order of magnitude of impact – rather than as a precise estimate.

The tendency of drained peat swamps to burn is also a climate change concern. Large-scale burning events have periodically engulfed the South-East Asian region after planters lost control of fires used to clear new land or prepare land for planting. The resulting fires release large amounts of carbon into the atmosphere. A major Indonesian fire event in 1997 is estimated to have released 190 – 230 $MtCO_{2e}$ (Page et al., 2002). To the extent that RSPO principles and criteria are obeyed, the risk of such fires is minimised. Principle 5.5 states: "Use of fire for preparing land or replanting is avoided, except in specific situations as identified in the ASEAN guidelines or other regional best practice."

Closely linked with the impacts on climate change are impacts on biodiversity. As with cocoa, the main driver of biodiversity loss is clearing of primary forests for cultivation. To the extent that respect for RSPO principles and criteria can limit clearing of primary forests, it can also limit biodiversity loss. Fitzhebert et al. (2008) found in a literature review that palm oil groves contained fewer than half as many vertebrates as primary forests. Across all taxa, they found that palm oil plantations contained a mean of 15% as many species as did primary forest. Koh et al (2011) mapped cleared lands in Sumatra, Borneo and Peninsular Malaysia, and found that the conversion of tropical peatlands had accounted for losses of biodiversity of 3.4%, 1% and 12.1% respectively.

RSPO certification addresses these sorts of losses in two ways: first, it prohibits clearing of "high conservation value" (HCV) land for the purpose of cultivation. Second, to the extent that it increases productivity through good agricultural practice, it translates into a need for less land per unit of output.

There are also some negative potential impacts of RSPO. For one thing, analysts such as Greenpeace (2013) and Laurance et al., 2010 allege that some RSPO members regularly cheat on their commitments, and that RSPO is not aggressive enough about policing and disciplining them. This means that not all palm oil certified as sustainable by RSPO may actually be so – arguably a worse outcome than what would prevail in the absence of RSPO, since at least in that scenario there would be more openness about the nature of the transgressions.

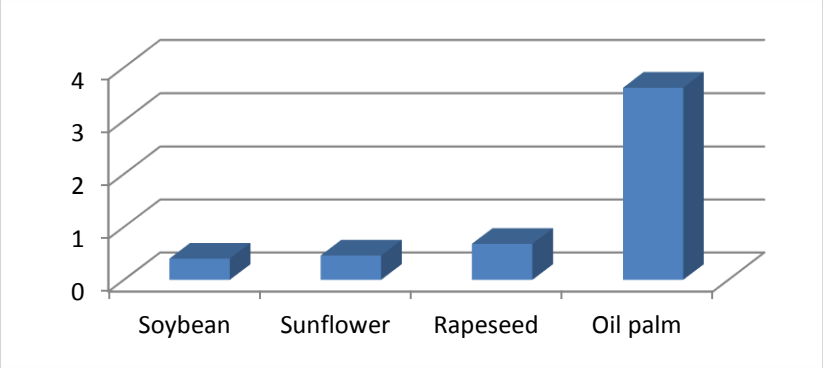
In addition, a 2013 assessment of members' compliance with the RSPO principles and criteria showed among other things that just over 50% had time-bound plans to certify their estates, and 68% had no time-bound plans to certify their contracted smallholders (WWF 2013). This is a

[22] Indonesia's 2012 emission figures are sourced from WRI's CAIT database: 761 $MtCO_2e$ (excluding land use change and forestry).

separate issue from the one raised above: members of RSPO can benefit from their green credentials without actually earning them.[23] In either case the result is environmentally damaging because the damage is being hidden from the public eye by the cover of RSPO credentials.

Another potential negative impact from RSPO labelling stems from the possibility that sustainability certification will increase the costs of palm oil or limit quantities available. Any such limitation would result in increased production of substitutes for palm oil – primarily soybean oil or rapeseed oil. But these two oils are more land-intensive than palm oil, rapeseed demands five times as many acres to produce an equivalent weight of oil, and soy demands nine times (see Figure 11). In terms of land conversion and habitat destruction, then, palm oil is orders of magnitude environmentally superior to the substitutes. But the ratios implied in Figure 11 only hold if we regard an acre of land suited to oil palm and an acre of land suited to soy or rapeseed as equally environmentally valuable. In fact those ratios, while they are significant, may need to be somewhat discounted.

Figure 11. Yield of major oilseeds (tonnes/acre/yr)



Source: Lam et al. (2009)

3.3. *EU's Product Environmental Footprinting*

Of the three sub-case studies, the EU's effort on PEF has the lightest body of assessment. This is in part because the regime is at this point still in pilot phase. Accordingly, much of what follows is taken from international literature focusing on labels and standards similar to those that the EU is propounding.

3.3.1. Economic and social impacts

The impacts discussed here all focus on the ways in which standards can affect market access. The economic impacts of restricted market access are clearly also drivers of social impacts in the area of employment, income generation and poverty alleviation. The impacts of facilitating market access through harmonisation of standards offers the flip side of the same dynamic. As

[23] RSPO members are supposed to abide by the Principles and Criteria even if they are not certifying their product.

such, this section will discuss economic and social impacts as a single theme rather than as separate topics.

The impact of primary interest, and one of the explicit objectives of the effort, is to reduce costs and increase market access for those producers who might qualify, or want to qualify, for special treatment on environmental grounds, but who are faced with a plethora of different standards in each different market, and in some case in each retailer within a given market. Producers of input goods may also be mandated by several different buyers to follow different standards for each, as each pursues its own system of managing the supply chain.

This is the classic economic case for harmonisation of standards. In the EU market there are a number of national initiatives that cause this sort of barrier to exporters. EC (2013:12) bemoans the rapidly increasing number of available methodologies for communicating the environmental attributes of products, leading to "a *proliferation* of national and private sector initiatives" (emphasis in the original). It cites the example of carbon footprint labelling, where there is a plethora of existing methodologies from which to choose: PAS 2050, BP-X30-323, the ISO 14,000 family of standards, the GHG Protocol and others. Marx and Wouters (2014) agree that proliferation is a problem, citing more than 400 voluntary sustainability standards in operation globally, and pointing to problems such as a credibility gap, high costs of certifying to multiple standards.

A potential negative impact of the PEF effort is another classic impact of standards: they are inherently more difficult for smaller firms to meet, and particularly difficult for small foreign firms for whom access to information may be a problem (ITC 2013). The tendency in the face of standards that reach back up the supply chain is toward vertical integration, which is a more cost effective way of ensuring that the demands of environmental quality are in fact observed at the various links in the chain. There is also a tendency for such standards to favour domestic and developed country producers (Shi 2013).

Clearly these tendencies will play out differently depending on the goods in question. Goods that rely on many small producers at the base of the value chain (like cocoa, palm oil, shrimp, rice and other major developing country agri-food exports) will tend to suffer disproportionately.

These effects are all more acute in the case of a label as a condition of sale (particularly when demanded by government) than in the case of a purely voluntary standard. In the latter case, if compliance with a standard is too costly the producer simply remains a supplier to the conventional market, leaving the standard-compliant market to other producers. As discussed above, of course, the ability to do this is lessened the more widely accepted the standard becomes. At the level of widespread uptake, even voluntary standards take on the effects of mandatory standards from the perspective of producers.

It is also worth noting that there are ways to address these challenges, primary among which is transparency of the standard and its requirements, with such facilities as a national point of contact for any questions foreign producers may have, and straightforward mechanisms for receiving comments on standards while they are still in draft form. This theme will be addressed in greater depth in Section 4.

Similarly, capacity building for producers has repeatedly shown itself to be effective in alleviating some of the challenges faced by producers in this situation. ITC (2012) catalogues a number of areas of research and development that might help developing country exporters better comply with carbon-related standards in their target markets. The beneficial impact of training and capacity building is well illustrated in the cases of cocoa and palm oil surveyed above. This theme will also be addressed in greater depth below.

3.3.2. Environmental impact

EC (2013) argues strongly for the environmental benefits of a single green market for goods within the EU (and with hopes for that effort to influence standards beyond the EU borders as well). In the first place, harmonisation facilitates the transfer of information to the consumer. Consumers faced with a barrage of different claims related to the same green attributes are discouraged from exercising their preferences toward green goods, lacking the time and inclination to fully understand and compare the various standards. In the same vein a more harmonised regime allows for a simpler job of consumer education, which is the foundation on which any standards regime must rest. Ultimately consumer labels only work when consumers understand their implications and respond in the marketplace.

As such the main positive impact of a harmonised regime of product environmental footprinting would be greater ability for green goods to find buyers. It was noted above that there is a substantial appetite on the part of consumers in OECD markets (and growing appetite in emerging markets) for more information as to the environmental implications of purchased goods, with a seeming particular preference for information in the foods sector.

A related environmental benefit to a harmonised approach to PEF is that it eliminates the ability for firms to proffer false and misleading claims about the environmental attributes of their products. By standardising the meaning of marketing terms such as ‘green,’ ‘biodegradable,’ a harmonised approach reinforces the trust that is a necessary prerequisite to a broader consumer uptake of green products.

3.4. *Summary of impacts*

Table 3 summarizes the major impacts found across the three cases surveyed above. In many cases the impacts are common across two or all three of them, though the specifics may differ markedly. Where an impact is specific to a particular case, this is noted.

Table 3: Summary of Impacts

	Economic	Social	Environmental
Positive	Premiums paid to certified producers	Human health (good agricultural practices in managing chemicals)	Climate change benefits (intended impacts): less deforestation, more efficient production process
	Market share, secured market access, reduced costs of market access	Gender – empowerment from management training (cocoa)	Increased biodiversity from reduced forest clearing (cocoa, palm oil)
	Increased productivity, product quality, management practices (as side effects of labeling demands)	Reduced child labour (cocoa)	More efficient use of environmentally harmful inputs
	Increased producer incomes from productivity	Preserves market share for labour-intensive practice (palm oil)	
Negative	Loss of income and/or market share for those producers that can't meet the standard; more serious a problem if the standard is mandatory, or in widespread use	Standards inherently disfavour small producers: higher per unit costs of compliance, and buyers often favour larger producers	Credibility, impact problems if the system is gamed
		Higher prices of labeled goods for consumers	More extensive land use if alternatives are promoted (palm oil)

4. Mitigation of impacts of food labelling

The preceding analysis surveys the impacts, both positive and negative, of a variety of types of labelling regimes, in a variety of contexts. Most of those impacts are positive, and this is to be expected given the public welfare objectives that impel the underlying policies. But there were also several negative impacts – for the most part unforeseen – that accompany the surveyed labels.

This section assesses how those negative impacts are being mitigated, and considers what additional sorts of mitigation policies might be appropriate. It is primarily aimed at the standard setters -- those who are charged with creating climate-related policies. For those policy-makers, this section asks the question: what parallel measures are being taken, or might be taken, either

by the standard-setting authorities themselves or by other bodies acting in concert with them, to mitigate the negative impacts that might be expected?

Often (but not always) the suggested additional mitigation measures will come with costs attached. Where such costs exist, as a supplementary question this section asks who might be engaged in supporting them.

4.1. *Disproportionate impacts on SMEs*

A common theme running through the various cases surveyed above was the disproportionate difficulty that standards pose for small and medium-sized enterprises (SMEs). For one thing, it was noted that there are fixed costs to obtaining information on the standard, learning how to adapt current production and management practices to comply, and then doing so on an ongoing basis. The smaller the operation, the more difficult it is to spread those fixed costs over the revenue streams, to the point where it is impossible for individual smallholder producers in the cocoa and palm oil sectors, for example, to do so alone.

For another thing, standards that force buyers to ensure the compliance of their primary producers tend to pose difficulties for those buyers, for whom training and quality assurance may not be core competencies. The tendency is to push the structure of the value chain toward vertical integration, under which the producer and the buyer are seamlessly integrated and compliance is easier to assure. This is arguably not as desirable an outcome from the perspective of poverty alleviation as the self-employed smallholder or the SME.

In either case beneficial environmental outcomes are accompanied by undesirable social and economic outcomes. There are a number of ways in which those undesirable outcomes can be mitigated:

Existing measures: training, capacity building. The cases of cocoa and palm oil clearly demonstrate the critical value of outside trainers acting to help bring small producers up to a state of compliance. Where the producers are small enough to warrant, they typically organise into cooperative groups that jointly seek such expertise. In the cases surveyed above, that organisation itself had numerous side benefits. But it almost never happened spontaneously – it was initiated by outside actors that understood the potential for standards compliance: buyers, NGOs, aid agencies. Similarly, even where the producers are large enough not to need to group up, they may be too small to understand the costs and benefits of standards compliance without outside counsel.

In the cases surveyed, these sorts of measures were highly effective at allowing smaller producers to take advantage of the opportunities offered by the various standards and labels. Without them, there arguably would have been no such participation, and the only standard-compliant production would take place in large plantations.

As noted above, the impacts of these efforts go beyond merely allowing producers to meet the standards. They also lead to higher productivity, higher incomes and safer use of chemicals through good agricultural practice, for example.

Where should the funds come from for such efforts? If certification earns the producer a premium, then part of that premium can be devoted to the training and capacity building. But initial funding will need to come from outside sources, since premiums arrive only after much of the training is done. That initial funding, and any supplements necessary over and above what can be bought with the premiums, should come from the government propounding the standard, if it is a government standard. The World Trade Organization's (WTO's) TBT Agreement stops short of requiring this of members that create standards. Article 12.7 does bind members to:

> "…provide technical assistance to developing country Members to ensure that the preparation and application of technical regulations, standards and conformity assessment procedures do not create unnecessary obstacles to the expansion and diversification of exports from developing country Members."

But that obligation is compromised by the allowance that any such assistance should be arranged "on mutually agreed terms and conditions."[24] That said, given the potential negative effects of climate-related standards, those terms and conditions should be generous.

Where the standard is not a government standard, assistance could (and does) come from aid agencies, NGOs, or from international sources such as development banks, or intergovernmental agencies such as the International Trade Centre (ITC) or the Global Environment Fund. There may also be a role for the UNFCCC to support developing country producer efforts to comply with climate-related standards, using vehicles such as the Green Climate Fund; often the final results will achieve objectives in the areas of mitigation, adaptation and economic diversification.

Existing measures: RSPO Smallholder Support Fund. Recognising the special challenges faced by smallholders (defined as 50 hectares or less) in the palm oil sector seeking to produce sustainably, the RSPO in 2013 launched its Smallholder Support Fund, to which smallholders can apply for assistance in getting certified. The Fund is built through a 10% levy on RSPO income from CSPO sales, as well as a dedication of 50% of surplus income. As of February 2014 the Fund stood at $1.25 million.

The process of RSPO certification takes on average one to three years, and smallholders can apply for support up to $100,000 per year for a maximum of three years. Support can go to training on agricultural practices, conservation activities, social development, market access and organisational growth, and/or can cover auditing costs. The funds must be matched by another sponsor, typically a product manufacturer or retailer.

Possible additional measures: s*pecial facilities for SMEs*. Along the lines of the RSPO special fund for smallholders, there might also be special rules and institutions for SMEs. In the same way that the Clean Development Mechanism (CDM) offers a simplified procedure for small projects, the standards might offer simplified verification and other procedures tailored for

[24] The Article 12.7 obligation is accompanied by the requirement that it be carried out in accordance with the provisions of Article 11. The need for mutual agreement on the terms and conditions of support is a hallmark of almost all the Article 11 obligations.

smaller producers, at least in their initial years of certification. Special provision might be made for group certification, in ways that bring down costs for individual producers.

Possible additional measures: no mandatory standards without universal assistance, demand stimulation. It was noted above that the impacts of mandatory standards are different from those of voluntary standards. The former, if they have high enough negative impacts, can simply be ignored by producers who prefer to supply the conventional (un-certified) segment of the market. The latter do not allow this strategy, shutting off market access for non-certified producers. This effectively amplifies the duress for small producers who, as noted above, may face higher per unit costs, and would probably be among those pursuing conventional markets were they available. In light of these dynamics, one possible additional policy would be an undertaking that any mandatory climate-related standards will be accompanied by mechanisms to distribute training and capacity building assistance to any producer that requests it.

In a similar vein, any mandatory standards might be accompanied by efforts by the implementing country to stimulate demand for the labelled products, and a system of education for consumers, so that demand does not diminish in the face of any price increases.

4.2. *Harmonisation of standards*

There is a seemingly straightforward solution to the problem of a proliferating field of standards covering the same attributes: harmonisation. In practice, however, harmonisation is anything but straightforward. Different jurisdictions may have fundamentally different starting points and objectives when regulating, even on the same subject matter, and the final shape of the regulations reflects that.

Existing measures: EU PEF. Efforts such as the EU's PEFs are potentially valuable in this regard, as they aim to act as market leaders which will eventually have enough critical mass to attract users from outside the EU. Even within the EU they have the value of potentially providing a single standard to which producers can adhere when selling in any EU member state. This lowers costs for producers, and acts to facilitate trade in environmentally preferable products.

Existing measures: ISEAL Alliance. The ISEAL Alliance is a non-governmental organisation that that strives to bring coherence and effectiveness to the practice of sustainability standards. Its stated goals are to improve the impacts and effectiveness of standards, to define credibility for sustainability standards, and to increase the uptake of such standards. ISEAL has published three codes of good practice as a reference for sustainability standards:

- **Assurance Code:** the Code of Good Practice for Assuring Compliance with Social and Environmental Standards is aimed at certifiers and accreditation of certifiers.
- **Standard-Setting Code**: the *Code of Good Practice for Setting Social and Environmental Standards* defines best practice in creating and implementing standards
- **Impacts Code:** the Code of Good Practice for Assessing the Impacts of Social and Environmental Standards defines best practice in measuring the effectiveness of standards.

These practices, if followed, will tend to make it easier for producers to comply with any given standard. This is true of the Standard-Setting code in particular, which demands transparency, accountability and relevance.

4.3. *Better understanding of the broader impacts*

Ultimately it is impossible to mitigate the negative impacts of climate-related food labels if those impacts are not known. Standards bodies should be conducting research along the lines surveyed in this paper, trying to discover what sorts of unintended consequences might result from their efforts. The scope of research should cover not just environmental impacts, but also economic and social. And it should cover not just national impacts, but international as well. This sort of research should be carried out both in the process of propounding the standards, and on an ongoing basis, as part of the process of monitoring results and striving for continuous improvement.

An efficient way to better understand these sorts of impacts is to ask affected parties to come forward with their input, both during the process of propounding the standards and on an ongoing basis. The EU's PEF has taken a long and careful tack in engaging a broad range of relevant stakeholders in its current phase, though it could do more to reach out to foreign producers. On an ongoing basis any standards regime should have a designated point of contact, an appellate mechanism, and full transparency of all applicable rules, so as to encourage and enable outside input.

Existing measures: COSA. COSA (The Committee on Sustainability Assessment) is a non-governmental organisation dedicated to rigorous assessment of the impacts of sustainability standards. They are committed to the ISEAL Impacts Code (see above) which demands, among other things, the use of control groups, and making evaluation data available to other researchers to facilitate replicability of findings. They evaluate impacts in the economic, social and environmental areas. COSA is retained on a consultancy basis, usually by the owner of a voluntary sustainability standard, to assess the scheme's impacts with a view to increasing effectiveness and reducing unintended negative effects. UTZ and Rainforest Alliance have used COSA repeatedly to conduct public and critical assessments of the impacts of their schemes.

5. Conclusion

This paper has surveyed the agricultural sector, and specifically food labels, as a case study in the broader impacts of climate-related policies. In the end it shows clearly that such policies will have impacts not only in their intended target area, but also in other facets of public policy – economic, environmental and social. Beyond the lessons learned specific to the food labelling case, the analysis here supports the notion that any climate change policies should be carefully assessed for their broader sustainable development impacts, both in their initial elaboration and on an ongoing basis.

The solutions proposed here are good illustrations of the way this approach can lead to broader welfare benefits without sacrificing the initial objectives. It is expected that this same basic

message will emanate from the other case study efforts conducted under the broader project, with lessons applicable to climate policy as a whole.

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