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Food standards and certification for inclusive and sustainable value chain development: Challenges and opportunities

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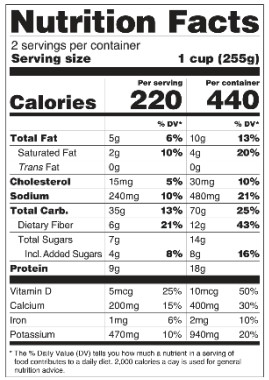
Overview

- General overview
- Case study 1: Organic standards
- Case study 2: Fairtrade standards
- Conclusion

Food standards

- Food standards: rules defining certain criteria that foods have to meet
- **Product standard:** food safety (e.g., maximum pesticide residues), quality (e.g., shape, ingredients), labeling (e.g., nutrition facts), etc.
- **Process standard:** types of inputs and technologies allowed (e.g., ban of certain pesticides or GMOs), animal welfare (e.g., minimum space requirements), smallholder involvement, labor standards, etc.
- Standards can be public (government) or private (companies, NGOs)
- Standards can be mandatory or voluntary
- Many standards in the “sustainability” domain are voluntary process standards, which are marketed to consumers through labels (e.g., Organic, Fairtrade, Rainforest Alliance, RSPO, etc.)



Nutrition Facts

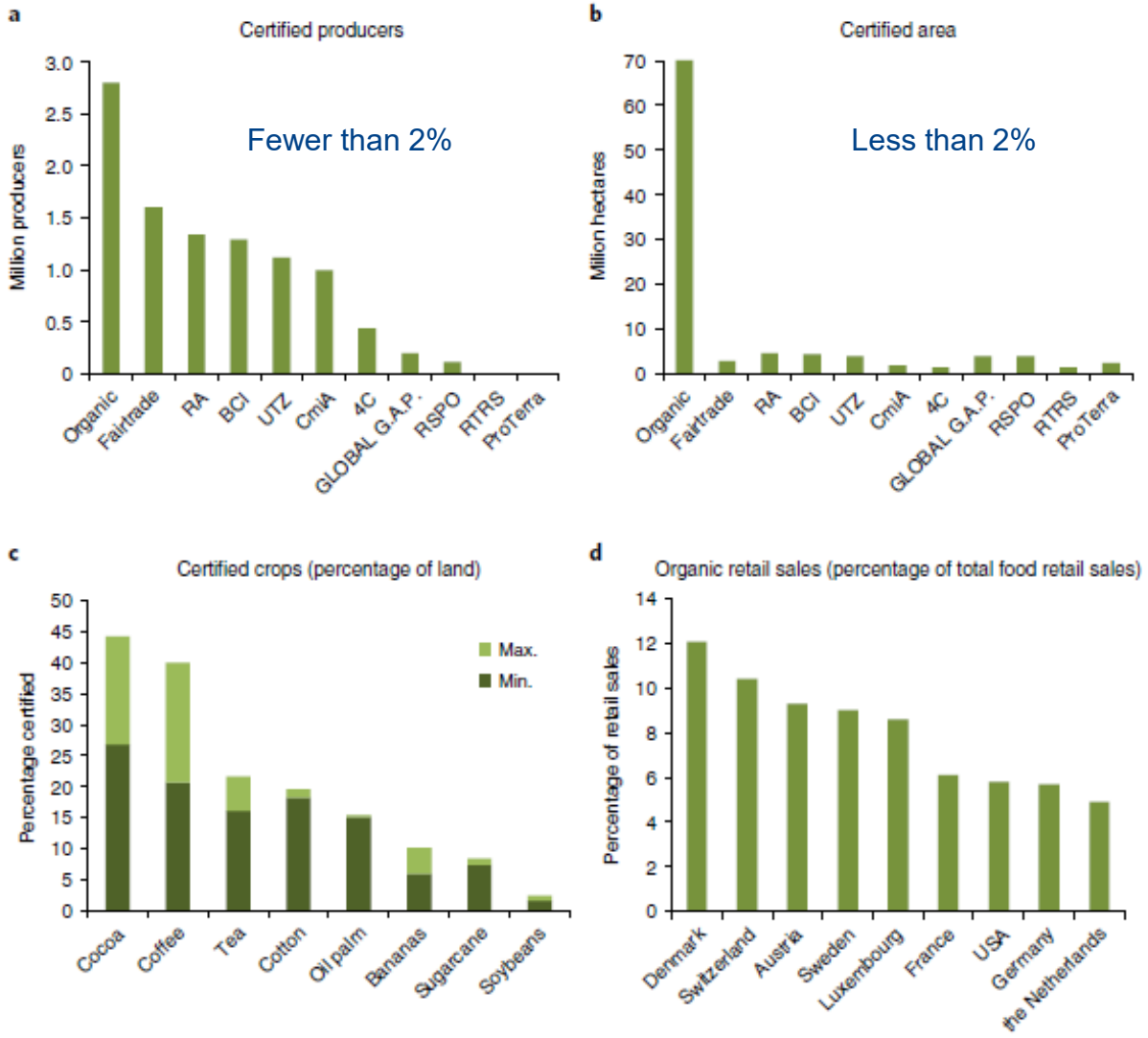
2 servings per container

Serving size **1 cup (255g)**

	Per serving		Per container	
Calories	**220**		**440**	
		% DV*		% DV*
Total Fat	5g	**6%**	10g	**13%**
Saturated Fat	2g	**10%**	4g	**20%**
Trans Fat	0g		0g	
Cholesterol	15mg	**5%**	30mg	**10%**
Sodium	240mg	**10%**	480mg	**21%**
Total Carb.	35g	**13%**	70g	**25%**
Dietary Fiber	6g	**21%**	12g	**43%**
Total Sugars	7g		14g	
Incl. Added Sugars	4g	**8%**	8g	**16%**
Protein	9g		18g	
Vitamin D	5mcg	25%	10mcg	50%
Calcium	200mg	15%	400mg	30%
Iron	1mg	6%	2mg	10%
Potassium	470mg	10%	940mg	20%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Importance of food sustainability standards



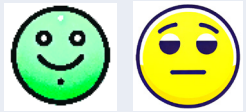
Source: Meemken et al. (2021, *Nature Food*)

- Sustainability standards have a sizeable market share for cocoa and coffee, but small market shares for most other products
- Products with sustainability labels are more popular in high-income than in low- and middle-income countries
- Most sustainability labels started with a certain focus (either environmental or social), few are comprehensive in their sustainability approach (even though many are now trying to broaden)

Environmental effects of sustainability standards

- Studies show that sustainability standards typically change farming practices, which is not surprising, as farmers have to follow specific regulations
- Organic certification leads to lower use of chemical inputs (effect size depends on status quo) and adoption of soil quality-enhancing organic practices. For other standards, the effects on farm input use are less clear and depend on the context
- Actual environmental outcomes (biodiversity, deforestation, water quality, etc.) have rarely been evaluated so far. Limited available evidence is mixed
- Available studies cover plot- or farm-level effects, rarely landscape-level effects
- Counterfactuals not always clear. Tendency that farms/regions that find it easier to meet certification requirements are more likely to adopt (lower environmental gains)
- Regional market segmentation may also limit environmental benefits (e.g., no-deforestation areas export to Europe, deforestation areas to the rest of the world)

Environmental effects of RSPO

Deforestation	
Cultivation on peatland	
Water pollution	
Air pollution	
Human toxicity	

Systematic Review

Source: Sibhatu and Qaim (2024)

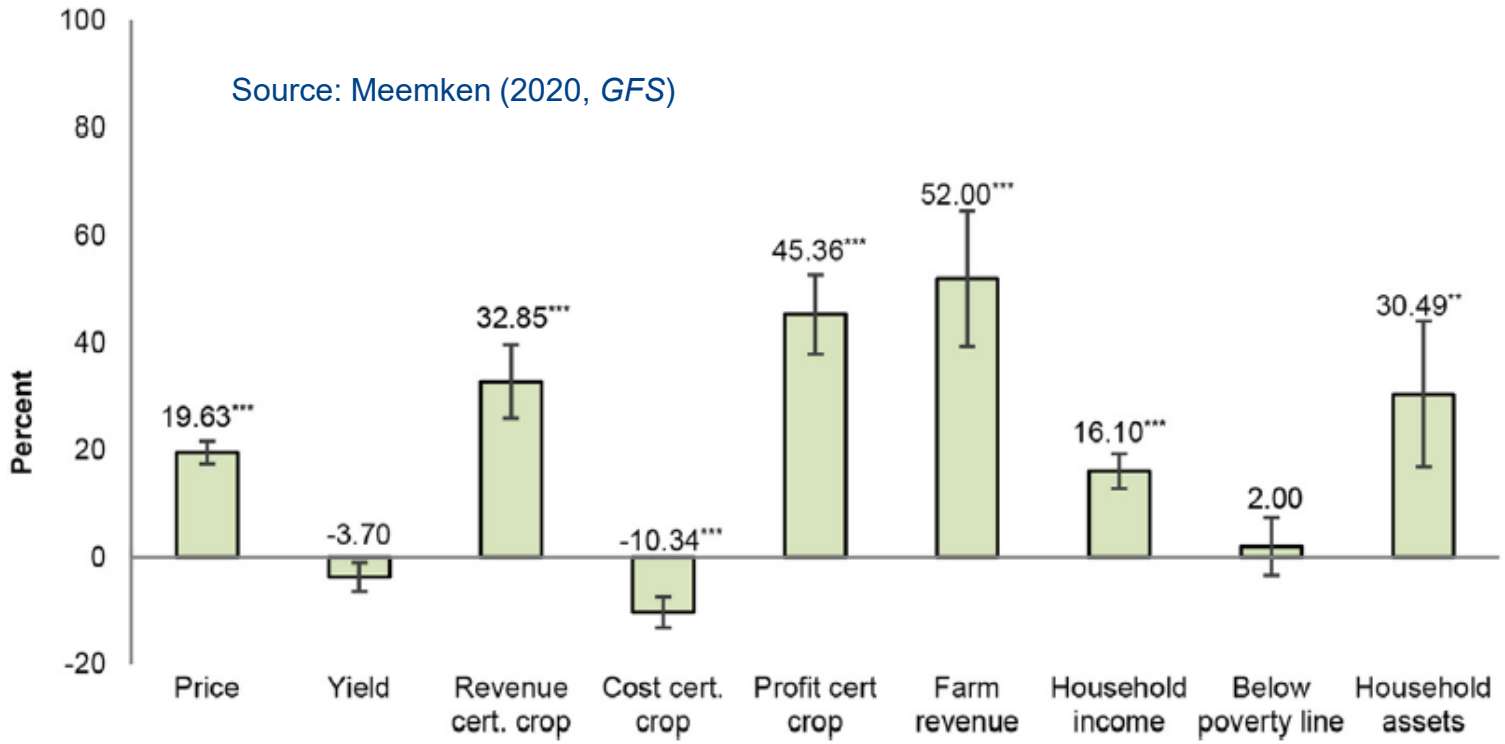
<3% of all oil palm smallholders are RSPO-certified

While most of the results are not yet satisfying, the environmental effects can be positive, if standards are implemented properly

Social effects of sustainability standards

Social effects particularly relevant for smallholder farmers in LMIC

Mean effects of sustainability standards on smallholders
(meta-analysis)



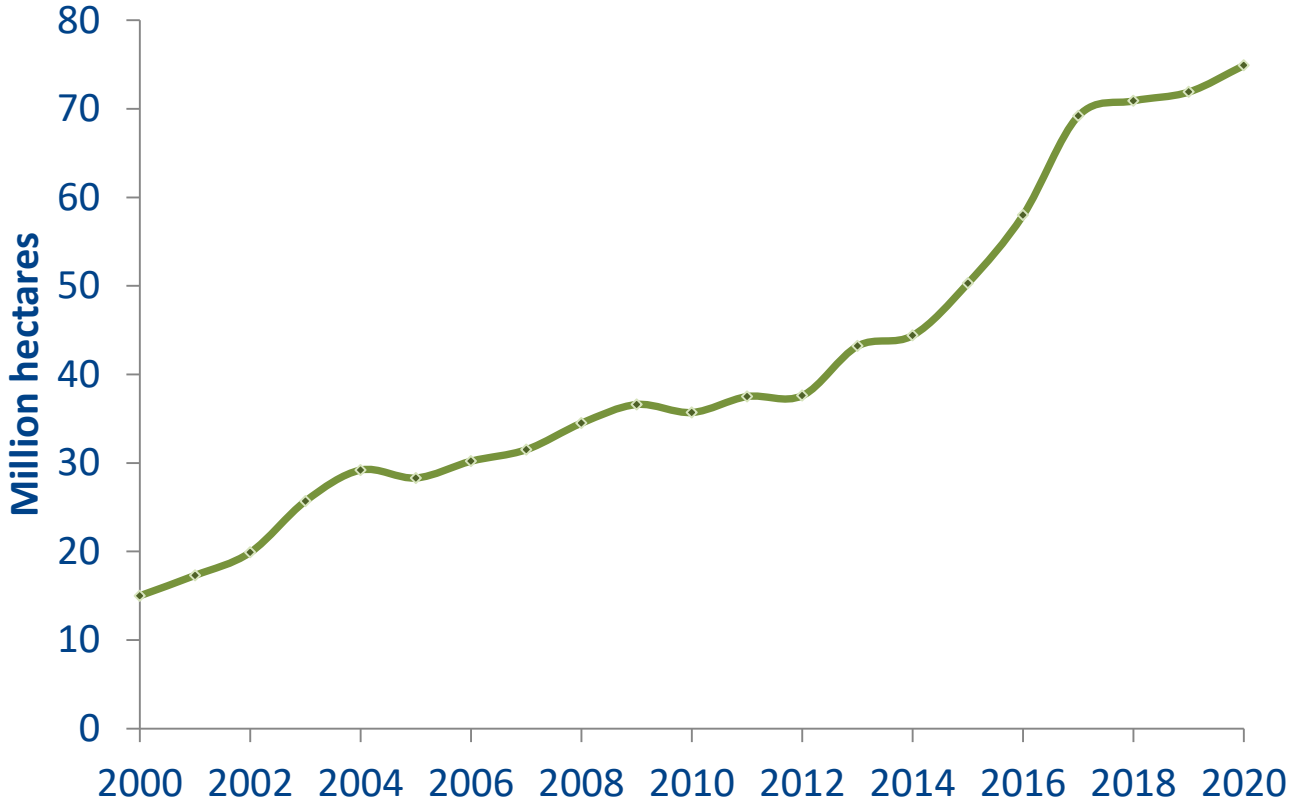
- Social effects differ by type of standard (often more positive for Fairtrade than for other standards)
- Only relevant for farmers producing export crops
- Smallholders have to be organized in groups
- The poorest farms are typically not included

Case study 1: Organic standards

- Organic is a voluntary standard that prohibits use of agro-chemicals and GMOs (organic movement is broader, but other criteria more difficult to monitor)
- Especially in Europe, organically-labelled food has a very positive image
- Polls show regularly that consumers associate organic farming with positive environmental, health, and social effects
- Not all of these effects really occur
- Many in Europe see “organic” as a synonym for “sustainable agriculture”
- EU Green Deal: 25% of farmland in EU shall be organic by 2030 (today <10%)

Growth of organic farming worldwide

Growth continues, but organic so far only accounts for less than 2% of global agricultural land



Top countries: Australia (35.7 m ha), Argentina (4.5 m), Uruguay (2.7 m)

Share of organic to total land: Liechtenstein (42%), Austria (27%), Estonia (22%)

Number of producers: India (1.5 m), Ethiopia (220 thsd), Tanzania (149 thsd)

Organic market (EUR): US (50 b), Germany (15 b), France (12 b)

Yield gaps in organic farming

Organic yields tend to be lower than conventional farming yields, mainly due to issues with nutrient supply and pest control

Results from three international meta-analyses

	Seufert et al. (2012)	de Ponti et al. (2012)	Ponisio et al. (2015)
Cereals	-26%	-21%	-22%
Roots and tubers	Not included	-26%	-29%
Oilseeds	-11%	-26%	-12%
Legumes/pulses	-10%	-12%	-15%
Fruits	-3%	-28%	-8%
Vegetables	-33%	-20%	-13%
All crops	**-25%**	**-20%**	**-19%**

Environmental effects of organic farming

	Per hectare of land	Per kg of output
Energy use	10-70% lower	15-21% lower
Greenhouse gas (GHG) emissions	14-39% lower	No difference; indirect land-use change (ILUC) may lead to higher emissions
Nutrient leaching / eutrophication potential	18-31% lower	11-36% higher
Biodiversity	30-40% higher	Effects through ILUC not evaluated

Source: Meemken and Qaim (2018, *Annual Review Res. Econ.*)

Organic and smallholders in LMIC

- Can organic certification help smallholder farmers escape poverty?
- Organic does not have a guaranteed price or social premium
- Impact studies show mixed results (some with price and income gains, others not)

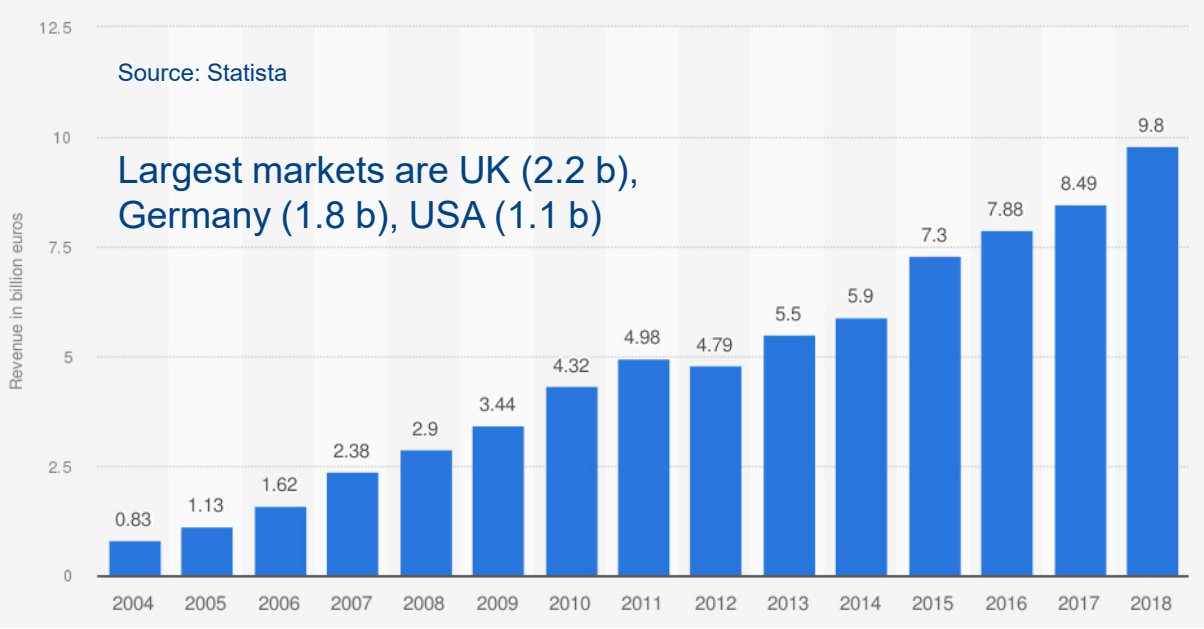
- Success stories typically build on pilot projects with very intensive training and support through development projects (upscaling difficult)
- Certified organic production almost exclusively in typical export crops (coffee, tea, cocoa, banana, etc.), not local food crops
- Demand for more costly organic food is very low in most LMIC

Case study 2: Fairtrade standards

- Fairtrade is an arrangement designed to help producers in LMIC achieve equitable trade relationships
- Focus on products that are typically exported from Global South to Global North
- Fairtrade certification guarantees a certain minimum price (floor price) for producers and a social premium for cooperatives (support for collective initiatives)
- Additional social and environmental/health rules (labor standards, safety rules for the use of pesticides, etc.)

Fairtrade trends in import markets

Global value of Fairtrade International certified products



Market share of Fairtrade products in Germany:

- Cocoa 16%
- Banana 10%
- Coffee 5%

In most other EU countries, market shares are smaller (in non-EU countries anyway)

Are producers benefiting from Fairtrade?

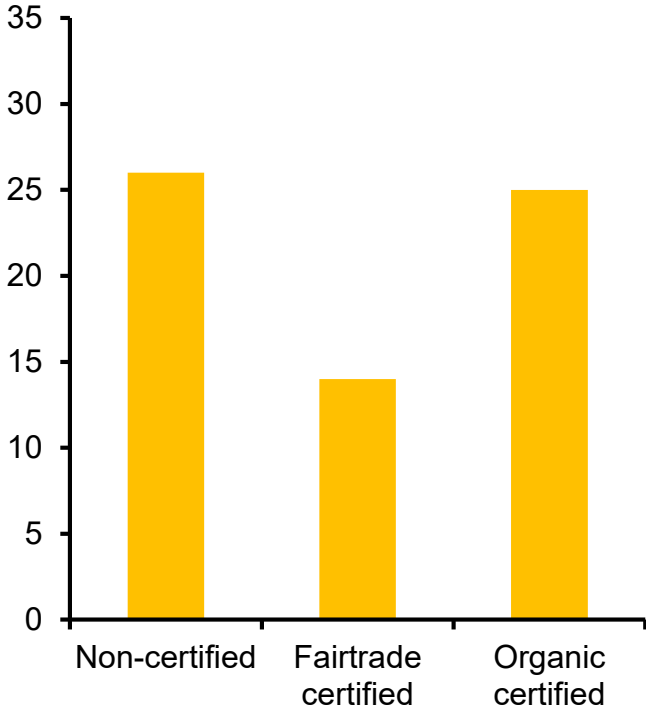
- Many producers of Fairtrade products are smallholder farmers
- Smallholders can only participate in Fairtrade when they are member of a cooperative that decides to get Fairtrade certified
- Poorest of the poor often not included

- Possible benefits are higher prices, better access to inputs, training, and other Fairtrade social premium projects
- Many (not all) studies show price and income gains for FT farmers
- Price gains for farmers much lower than FT markup consumers pay
- In several Latin American countries, over-certification was reported

Example of coffee farmers in Uganda

Source: Chiputwa et al. (2015, *World Dev.*)

Poverty rates (%)



Collective processing and marketing

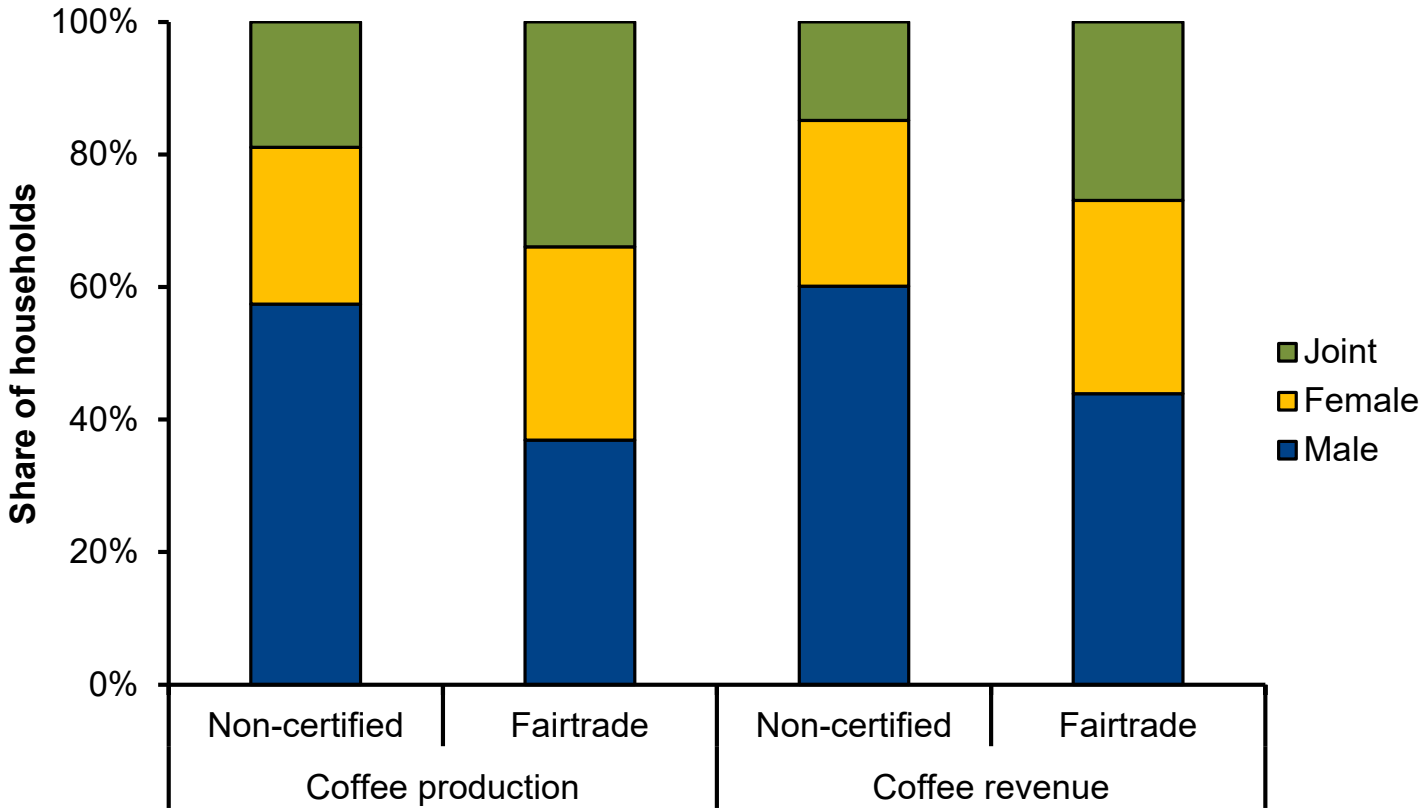
Training programs supported by Fairtrade

Estimated net effects of certification

	Fairtrade	Organic
Consumption expenditure (UGX/capita)	1029***	242
Poverty rate	-0.15**	-0.04

Fairtrade strengthens women's role (Uganda)

Gendered control of coffee production and revenues



Fairtrade coop organizes:

- Gender role awareness workshops for women with their husbands
- Agricultural training sessions for women
- Payment of coffee revenues to husbands/wives together

Not all Fairtrade coops have special focus on gender roles

Source: Chiputwa and Qaim (2016, *JDS*)

Fairtrade effects and cooperative effects

- Studies on Fairtrade effects typically compare farmers in a Fairtrade coop with farmers in a non-certified coop (or not organized in a coop at all)
- How do we know whether the observed effects are due to Fairtrade, or due to differences in general coop characteristics, or a combination of both?

Study of cocoa farmers in Cote d'Ivoire

- We sampled farmers from a larger number of coops (n = 500 from 25 FT and 25 non-certified coops)
- Data on farm/household and coop characteristics
- Regression models on FT effects, controlling for coop characteristics

Net effects of Fairtrade after controlling for cooperative characteristics

	Effect (%)
Cocoa yield	+21***
Cocoa price	+4***
Consumption expenditure	+15*
Food expenditure	0
Non-food expenditure	+18***

Sources: Sellare et al. (2020, *AJAE*), Knößlsdorfer et al. (2021, *GFS*)

Do farm/company workers benefit from Fairtrade?

Fairtrade does not only focus on farmers, but wants to improve the living conditions of poor workers as well. Certain minimum labor standards need to be followed

Fairtrade and workers on large pineapple plantations (Ghana)

	Effect (%)
Wage level	38***
Job satisfaction	21***
Permanent employment	37***
Trainings received	190***

Sources: Krumbiegel et al. (2018, *World Dev.*)

Fairtrade and workers in small farm cocoa sector (Cote d'Ivoire)

Effect on…	Cooperative employees	Small farm workers
Work income (1000 CFA/y)	696.48***	112.74
Above minimum wage	0.59***	-0.09
Poverty rate	-0.35***	-0.10

Sources: Meemken et al. (2019, *Nature Sust.*)

Auditing labor conditions is possible on large plantations/coops, but difficult on small farms

Fairtrade, environment, and health

- Fairtrade bans a few very toxic pesticides
- It also requires safe pesticide storage and spraying with protective measures
- Agricultural training may lead to more or less agrochemical use
- Many Fairtrade coops facilitate access to inputs through collective action

Mean input use among Fairtrade certified and non-certified farms in Cote d'Ivoire

	Fairtrade	Non-certified
Fertilizer (kg/ha)	48.5***	27.5
Pesticides (kg/ha)	2.1**	1.7
Env. Impact Quotient (EIQ)	24.0**	16.7
Pesticide poisoning cases	1.2***	2.3

Source: Sellare et al. (2020, *Env. Econ.*)

Conclusion

- Voluntary sustainability standards are gaining in importance in some market segments, but their global market shares are still low
- Effects on various sustainability dimensions are mixed:
  - Environmental standards (Organic, RSPO, etc.) have environmental benefits in some situation, not in others. Social benefits limited
  - Social standards (Fairtrade, etc.) have mostly positive social, but not necessarily positive environmental effects
- Standards are evolving. Stricter rules and enforcement may improve outcomes, but would also lead to higher costs and consumer prices, which might reduce market growth potential
- Well-designed voluntary sustainability standards can be useful in certain situations, but are unlikely to promote sustainability objectives globally at scale