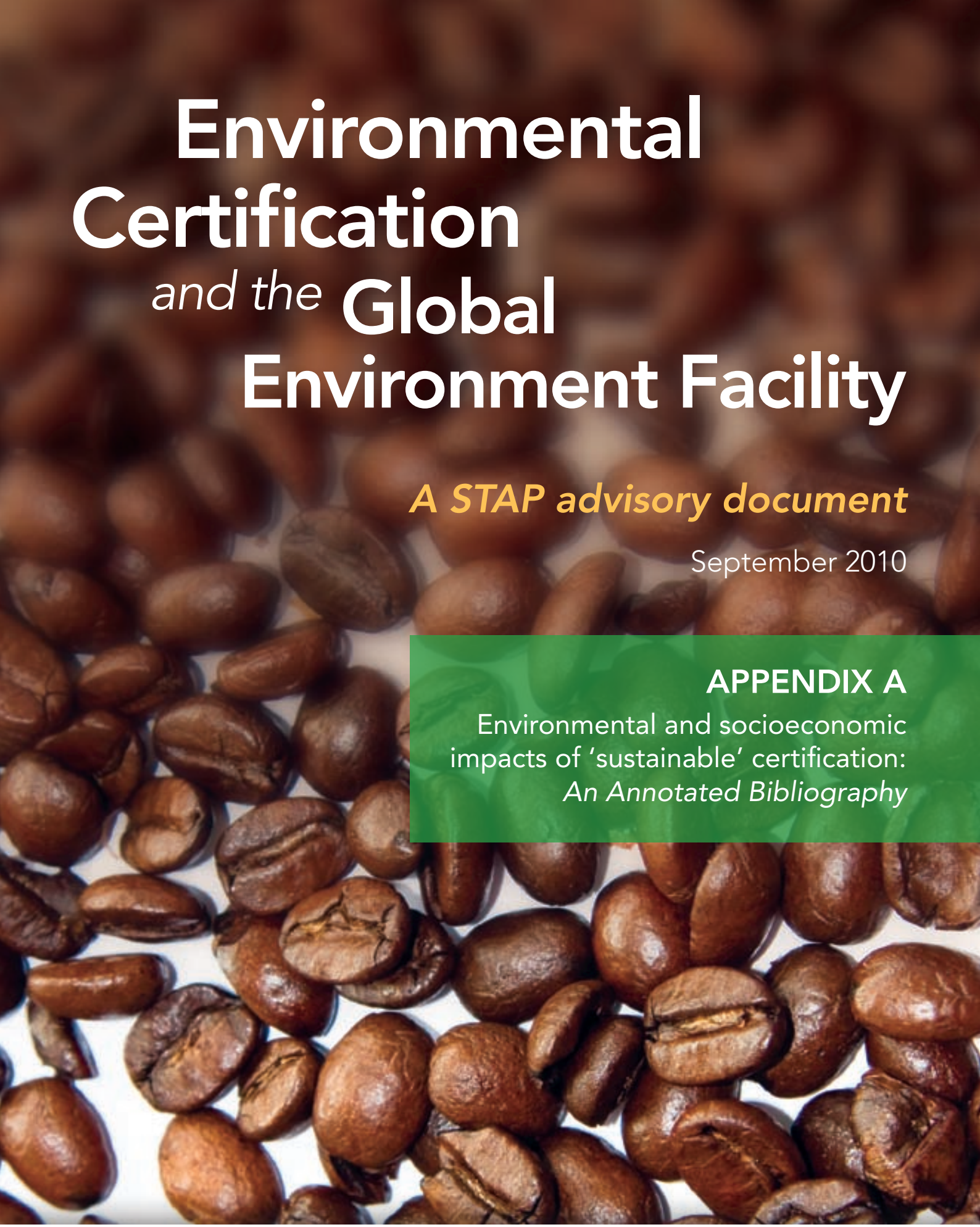
Environmental Certification *and the* Global Environment Facility

A STAP advisory document

September 2010

APPENDIX A

Environmental and socioeconomic impacts of 'sustainable' certification: *An Annotated Bibliography*



Scientific and Technical Advisory Panel

The Scientific and Technical Advisory Panel, administered by UNEP, advises the Global Environmental Facility

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Appendix A Table of Contents

I. BANANAS

CATEGORY A: FOCUS ON IMPACT

Category A1: Accounts for selection bias using quantitative methods

Fort, R. and R. Ruben. 2008. "The impact of fair trade on banana producers in Northern Peru." Chapter 2 in R. Ruben. *The Impact of Fair Trade*. Wageningen Academic Publishers. The Netherlands.

2. **Sector:** Bananas
3. **Category:** A1
4. **Rationale for categorization:** The paper focuses on the impact of fair trade certification on farmer income and wealth. Controls for selection bias using matching (propensity score matching) based on nine household characteristics.
5. **Type of certification:** Fair Trade (FT)
6. **Study area:** Northern Piura region of Peru.
7. **Study years:** not specified.
8. **Method of analysis:** Analysis of household survey data on land use, production income, assets and expenditures for the control and treatment groups. Treatment group consists of 50 farmers randomly selected from a single cooperative called *Asociation de Productores de Banano Organico del Valle de Chira* (APVCH). The cooperative is both FT and organic certified. Therefore, to estimate the impact of FT certification, the authors compare outcome variables for the treatment group and for two control groups. One control group consists of 110 farmers randomly selected from a cooperative called *Asociation de Productores de Banano Organico de Salitral* (APBOS) that is organic certified. The cooperative is recently FT certified, but has not yet begun to market their crop as such. A second control group consists of 40 farmers that are neither organic nor FT certified. This group was selected by snowball sampling (asking APVCH farmers to identify noncertified neighbors).

8A. **Methodological issues.** The effort to construct a counterfactual using propensity score matching is reasonably credible. However, the members of the treatment group and the control groups are drawn from different farmer cooperatives. As a result, unobserved factors correlated with cooperative membership, and therefore FT certification, may also be correlated with outcomes. In other words, unobserved factors—not FT certification—may drive the result that FT farmers have higher net incomes and profits.

9. **Findings about impact of certification.** (A) 50 FT farmers (treatment group #1) compared to 110 organic farmers (control group): FT farmers have higher net income and profits which are almost exclusively due to higher productivity of FT producers (not to higher prices). Higher productivity likely due to having technical assistance and more investment. FT farmers also have higher assets, receive more credit, have higher land values, are more identified with their farmer organization, and less risk averse. (B) 50 FT farmers (treatment group) compared to 40 conventional farmers (control group #2). FT farmers have higher gross income. But here, difference mainly due to higher prices. FT farmers also have 40% higher household expenditure, and more access to credit. (C) Other effects: FT production in study area seems to have caused increase in price of conventional non-certified bananas. Qualitative results were also drawn relative to the benefits certified farmers perceive from the FT premium. 92% express their households receive direct benefits from its use.

"These results provide clear evidence of the impact of FT involvement on income and overall welfare indicators for banana farmers in the Chira Valley. These improvements are not only achieved via the better price obtained for FT sales but also because of higher productivity levels obtained as a result of the FT premium investment. Moreover, the introduction of the FT market for banana producers in the Valley seems to have had an important effect on local farm gate prices for conventional bananas."

Ruben, R. and L. van Schendel. 2008. "The impact of Fair Trade in banana plantations in Ghana: Income, ownership and livelihoods of banana workers." Chapter 6 in Ruben, R. *The Impact of Fair Trade*. Wageningen Academic Publishers. The Netherlands.

2. **Sector:** Bananas
3. **Category:** A1/A1b
4. **Rationale for categorization:** Paper focuses on impacts of Fair Trade (FT) certifications on incomes of workers and their families. The authors construct a matched control sample to approximate counterfactual using inexact matching on a few characteristics.
5. **Type of certification:** fair trade
6. **Study area:** eastern Ghana
7. **Study years:** 2007
8. **Method of analysis:** Surveys of random samples of 50 workers from (i) a Fair Trade plantation called Volta River Estates (VREL) and 50 matched workers (ii) non-Fair Trade plantation called Golden Exotics Ltd. (GEL). Survey data included information on workers, their families, their jobs and benefits, and their attitudes (sense of ownership, corporate identification, job satisfaction, attitudes toward FT, time preference). Simple difference in means test treatment versus control samples.

8A. **Methodological issues.** (A) Matching to construct counterfactual is weak. The authors use inexact matching on five characteristics (household size, age, highest education level, acres of land owned, and asset value). Matching was not pair wise. Rather an attempt was made to ensure that average characteristics of treatment and control samples were not significantly different. Also, asset value is potentially endogenous. (B) the members of the treatment group and the control groups are drawn from a different farmer cooperatives. As a result, unobserved factors correlated with cooperative membership, and therefore FT certification, may also be correlated with outcomes. In other words, unobserved factors—not FT certification—may drive the results.

9. **Findings about impact of certification:** Non-FT workers receive total higher salary and have higher total family income than FT workers but have to work more hours and receive less fringe benefits. "Dividing salaries by effective working hours, VREL workers are clearly better off." There is not significant difference in total expenditures between the two groups. Subjective feeling regarding job safety, job satisfaction and fairness are broadly similar among FT and non-FT workers. FT workers were less risk averse. Workers identification with the company and sense of co-ownership are higher for the FT group. Importance given to fair trade is stronger among workers with higher positions and owning more assets.

Zúñiga-Arias, G. and F. Sáenz Segura, 2008. "The impact of Fair Trade in banana production of Costa Rica" Chapter 4 in R. Ruben, R. *The Impact of Fair Trade*. Wageningen Academic Publishers. The Netherlands.

2. **Sector:** Bananas
3. **Category:** A1
4. **Rationale for categorization:** Paper focuses on impacts of Fair Trade (FT) certifications on income and other socioeconomic indicators for worker households. The authors use propensity score matching to construct a control sample.
5. **Type of certification:** Fair Trade
6. **Study area:** southern Costa Rica
7. **Study years:** not specified
8. **Method of analysis**. Uses household survey data along with propensity score matching to analyze the impact of FT certification on banana producer households. Treatment sample is from a FT certified cooperative called *Coopetrabasur* (n = 58) and the control sample is from a non-FT certified association called *Finca San Pablo* (n = 55). Matching is based on six characteristics (years working at organization, age of household head, family size, contribution of household head, years living in region, years living in community)

8A. **Methodological issues.** (A) The members of the treatment group and the control groups are drawn from a different farmer cooperatives. As a result, unobserved factors correlated with cooperative membership and therefore FT certification, may also be correlated with outcomes. In other words, unobserved factors—not FT certification—may

assets). FT households invest more in education and training. Females contribute more income in non-FT households. Regarding attitudinal variables, FT farmers have a have a more positive view of their current and future wellbeing and a stronger feeling of belonging to their community. Regarding the FT premium, 86% think it is beneficial but 76% think they have not been consulted about the way the premium is used.

drive the result that FT farmers have higher net incomes and profits. (B) some of the characteristics used to conduct matching are potentially endogenous (contribution of household head).

9. **Findings about impact of certification:** Regarding socioeconomic indicators, there were no significant differences between FT and non-FT in income, expenditures, or profits. However, FT households have higher levels of wealth (total

Category A2: Does not account for selection bias

Melo, C. J. and S. A. Wolf. 2007. "Ecocertification of Ecuadorian bananas: Prospects for progressive North–South linkages." *Studies in Comparative International Development* 42: 256–278.

2. **Sector:** bananas
3. **Category:** A1
4. **Rationale for categorization:** Paper focuses on impacts of Fair Trade (FT) and Rainforest Alliance (RA) certifications on environmental performance. The authors construct a control sample to approximate counterfactual, but it is not a matched sample.
5. **Type of certification:** one set of treatment farms are Fair Trade (also Organic and EUREPGAP) and a second set are Rainforest Alliance (also ISO 9000).
6. **Study area:** western Ecuador.
7. **Study years:** 2003.
8. **Method of analysis:** The authors construct two treatment samples. The first is called environmentally sustainable (ES) and is comprised of a random sample of 10 farms that belong to belong to a company called *Reybanpac* certified en mass by RA. All of these farms are large (> 50ha). The second is called socially sustainable (SS) and is comprised of a random sample of 13 farms that belong to a producer association called the Association of *Banana Producers of El Guabo* certified en mass by Fair Trade. All of these farms are small (< 50ha). The control sample were constructed by "snowball sampling" finding noncertified farmers and asking them to identify others. They are not matched except on the basis of size. The control sample consists of 15 large farms and 9 small ones. The authors simply compare "risk reduction scores" for four categories of risks (land management, water quality, agrochemical management, and waste management) and for total risk. They use nonparametric Mann Whitney U tests to do that. A second part of the analysis (not summarized here) examines the factors that drive certification.

8A. **Methodological issues.** (A) This article does not construct a credible counterfactual. The control sample is not a matched sample. Therefore, the comparison between treatment and control says little about causal impacts of certification. The comparison confounds (i) the impact of certification on farm characteristics with (ii) pre-existing characteristics of farms that choose to become certified. (B) sample sizes are quite small. (C) the ES and SS certified farms are pooled in statistical analysis. (C) all certified farms drawn from two cooperatives/companies.

9. **Findings about impact of certification:** "… firms engaged in labeling schemes generate lower environmental risks than uncertified firms. Certified firms exhibit relatively comprehensive environmental management systems, while noncertified farms exhibited limited, uneven, and unstructured adoption of best management practices." In other words, certified farms exhibit better environmental management.

Ruben, R., L. Clercx, D. Cepeda, and T. de Hopp. 2008. "Fair trade impact of banana production in El Guabo Association, Ecuador: A production function analysis. Chapter 7 in R. Ruben. *The Impact of Fair Trade.* Wageningen Academic Publishers. The Netherlands.

2. **Sector:** Bananas
3. **Category:** A1
4. **Rationale for categorization:** Paper focuses on impacts of Fair Trade (FT) certifications on farm productivity, farm income, and other farm characteristics. However, there is no attempt to develop a credible counterfactual that controls for selection bias.

5. **Type of certification:** Fair Trade
6. **Study area:** western Ecuador
7. **Study years:** not specified
8. **Method of analysis:** Treatment (FT) sample drawn from one producers association called El Guabo (n = 57) and control sample (non-FT) drawn from neighboring farms (n = 63). All producers have banana monoculture production in dry lands with good access conditions. No attempt to match controls and treatment farms. To determine whether there are difference between treatment and control farms the authors conduct various statistical tests, mostly difference in means, but to test for difference in labor productivity they estimate Cobb-Douglass production functions for each sample and then conduct Chow test to determine whether splitting sample (FT and non-FT farms) is justified.

8A. **Methodological issues.** (A) This article does not construct a credible counterfactual. The control sample is not a matched sample. Therefore, the comparison between treatment and control says little about causal impacts of certification. It confounds the impact of certification on farm characteristics with pre-existing characteristics of farms that choose to become certified. (B) The production function estimates for noncertified farmers are suspect, marginal product of labor is negative and no other regressors are significant. (C) all certified farms drawn from one cooperatives/companies.

9. **Findings about impact of certification:** Main findings: FT farmers have higher yields (boxes of bananas per hectare), use more organic fertilizer, more pest control, have higher labor productivity (non-FT farmers actually have negative labor productivity), higher assets, credit access, and invest more in production improving and packing conditions, in environmental care and health care and life insurance. The authors hypothesis that for FT farmers "improved access to market outlets and hither and more stable prices could enable producers to realize substantial in-depth investments in their banana farms" Note that the $1 per banana box premium received by the farm association is dedicated to credit provision to enhance technification (20%) and social and environmental programs (80%). The association gets technical support from various organizations "to support business development and to guarantee the effective us of the premium funds."

CATEGORY B: Not Focused on Impact but Relevant

None

II. COFFEE

CATEGORY A: FOCUS ON IMPACT

Category A1: Accounts for selection bias using quantitative methods

Arnould, E., A. Plastina, and D. Ball. 2009. Does Fair Trade deliver on its core value proposition? Effects on income, educational attainment, and health in three countries. *Journal of Public Policy and Marketing* 28(2): 186-201.

2. **Sector:** Coffee
3. **Category:** A1
4. **Rationale for categorization:** The paper includes an empirical test for socioeconomic impacts of Fair Trade certification and attempts to control for self selection bias confounding factors.
5. **Type of certification:** Fair Trade (FT)
6. **Study area:** Nicaragua, Peru and Guatemala
7. **Study years:** not specified
8. **Method of analysis:** The paper tests for impacts on a variety of socioeconomic indicators of FT certification in communities in Nicaragua, Peru and Guatemala. The authors use a multi-stage method to control for self-selection bias and confounding factors. To select a matched control group of non FT farmers, they first chose communities adjacent to FT certified communities and that had comparable climate, geography, and growing conditions including altitude, infrastructure, and distance to market. Next, they choose farms in these communities that met the farm size criteria for FT participation (1-3 has. per adult household member). Finally, they used the pooled sample of certified and noncertified farmers in each study country to run regressions to explain various farm-level socioeconomic indicators including coffee volume sold, price obtained, educational attainment, and health. The explanatory variables in these regressions include a dummy indicating whether the farm was FT certified along with various farm and farmer characteristics.
8. **Methodological issues.** Procedures used to match farms are somewhat ad hoc. The study was funded by a FT certifier.
9. **Findings about impact of certification:** The authors find that FT certification is positively correlated with coffee volume sold and price obtained, but less consistently with their indicators of educational and health status.

Blackman, A. and M.A. Naranjo. 2010. Does Eco-Certification Have Environmental Benefits? Organic Coffee in Costa Rica. Working Paper. Resources for the Future: Washington, D.C.

2. **Sector:** Coffee
3. **Category:** A1
4. **Rationale for categorization:** The paper includes an empirical test for environmental impacts of organic certification and attempts to control for self selection bias confounding factors.
5. **Type of certification:** Organic
6. **Study area:** Central Costa Rica
7. **Study years:** 2003-2004
8. **Method of analysis:** The authors use detailed agricultural census and GIS data on over 6,000 farms in Central Costa Rica to test for the environmental impacts of organic certification. They compare rates of adoption of four environmentally friendly farm management practices (soil conservation measures, shade trees, windbreaks, and organic fertilizer) and three unfriendly practices (pesticides, chemical

fertilizers, and herbicides) for certified farms versus a control group of noncertified farms. To control for self-selection bias, they use propensity score matching to construct the control group of noncertified farms. They control for the age and education of the farmer and various physical characteristics of the farm including size, coffee variety, weather condition, slope, aspect, and distances to population centers.

8. **Methodological issues.** The sample of certified farmers is relatively small.
9. **Findings about impact of certification:** The authors find that organic certification improves coffee growers' environmental performance. It significantly reduces chemical input use and increases the adoption of environmentally friendly management practices.

Bolwig, S., P. Gibson, and S. Jones. 2009. "The economics of smallholder organic contract farming in tropical Africa." *World Development* 37(6): 1094–1104.

2. **Sector:** Coffee
3. **Category:** A1
4. **Rationale for categorization:** The paper tests for impacts on coffee farm income of (i) organic certification, and (ii) adoption of organic practices. The authors use a Heckman model to correct for selection bias.
5. **Type of certification:** Organic (Kawacom Sipi Organic Arabica)
6. **Study area:** eastern Uganda
7. **Study years:** 2005
8. **Method of analysis:** Analysis of participation in a program of organic "contract farming", i.e., a private sector buyer (Kawacom U. Ltd.) pays for farmers to obtain certification, and then buys their organic coffee. The authors randomly selected 112 participants and 48 nonparticipants. The authors test for impacts on coffee farm income of (i) organic certification, and (ii) adoption of organic practices. They use a Heckman selection model to correct for selection bias. They include two "instrumental variables" in the participation equation that are excluded from the revenue equation. Dependent variables were gross crop revenue and net coffee revenue (total coffee revenue minus all costs given under group). Covariates include household demographic variables, farm area, number of coffee trees, farm equipment, and expenditure over the previous two seasons on labor and other inputs and assets and on processing and marketing.
8. **Methodological issues.** No major issues.
9. **Findings about impact of certification:** Certification "is associated with an increase in net coffee revenue of around 75% on average, equivalent to 12.5% of mean (total) household revenue. This is accounted for by the enhanced incentives provided by the [contract farming] scheme to engage in processing of the coffee crop, thereby enabling farmers to access guaranteed price premiums. The effect of applying organic techniques is more modest. We estimate that each additional organic technique used generates a gain equal to around 9% of net coffee revenue, explained by a positive association between these practices and yield per tree."

Fort, R. and R. Ruben. 2008. "The impact of fair trade on coffee producers in Peru." Chapter 3 in R. Ruben. *The Impact of Fair Trade*. Wageningen Academic Publishers. The Netherlands.

2. **Sector:** coffee
3. **Category:** A1
4. **Rationale for categorization:** The paper tests for impacts on coffee farm economic characteristics and farmer perceptions of FT certification. It controls for selection bias using the propensity score matching.
5. **Type of certification:** Fair Trade
6. **Study area:** Central Peru
7. **Study years:** not specified
8. **Method of analysis:** The authors use original survey data. Their treatment group consists of 151 producers from three FT cooperatives (Ubiriki, Pangoa, and La Florida) and 164 producers from three non-FT cooperatives (Tahuantisuyo, Pichanaki, and Sangareni) some of which are in the process of getting FT certified. The treatment group was randomly selected from the FT cooperatives. Propensity score matching was used to select the control group. Matching was based on 9 characteristics (age of head of household, education of head of household, family size, area of coffee, area of other crops, travel time from farm to capital, value of agricultural assets until 1999, membership in organization prior to 2000, and years residing in present location).

   Because some FT producers are also organic certified, compared two treatment and control samples: (A) organic FT farmers versus organic non-FT farmers, and (B) non-organic FT farmers versus non-organic non-FT farmers.

9. **Methodological issues:** (A) matching not based on observable differences between treatments and controls that the authors claim influenced outcome variables, e.g., cooperative membership, percent of crop sold as organic (B) some regressors in participation regression may be endogenous (e.g., area of coffee and other crops).
9. **Findings about impact of certification:** (A) organic FT farmers versus organic non-FT farmers: (i) income variables (income, price, productivity, profits): no significant difference in income variables ; (ii) wealth variables (expenditures, assets, savings, credit); FT farmers have higher levels of animals stocks, better access to credit, and more agriculture assets in past years; (iii) investment variables: no significant difference; (iv) perception variables: FT farmers express a higher level of satisfaction with the services they receive from their cooperatives. (B) non organic FT farmers versus non organic non-FT farmers: (i) income variables (income, price, productivity, profits): FT farmers have lower gross an net income and lower productivity; (ii) wealth variables (expenditures, assets, savings); FT farmers have higher levels of animals stocks; (iii) investment variables: FT farmers had higher levels of investments in some years; (iv) perception variables: FT farmers do not in general express a higher level of satisfaction with the services they receive from their cooperatives.

   Lack of real price differential seems to be main reason for lack of FT impact on income and wealth. "The lack of many expected effects from FT can at least partially be attributed to the deficient distribution and use of the FT premium perceived by our sample of farmers." Only 23% of FT producers claim to get any benefit from it.

Lyngbaek, A., R. Muschler and F. Sionclair. 2001. Productivity and profitability of multistrata organic versus conventional coffee farms in Costa Rica. *Agrofestry systems* 53: 205-213.

2. **Sector:** Coffee
3. **Category:** A1
4. **Rationale for categorization:** Focuses on economic impact of certification on farm. Weak correction for sample selection.
5. **Type of certification:** organic
6. **Study area:** Costa Rica
7. **Study years:** 1995-1998.
8. **Method of analysis:** Identified 10 matched pairs of organic and conventional farms in five regions of Costa Rica, each with varying agroecological conditions. All farms smaller than 7 ha. Organic farms had (i) a history of at least 3 years of organic management, (ii) subject to active organic management, (iii) majority of coffee plants in production. Conventional farms selected mostly for proximity to respective organic counterparts, and similarly of altitude and area under coffee. The matching is pretty weak.
9. **Findings about impact of certification:** Yields on organic farms were lower than on conventional farms. Mean variable costs and net income (excluding fixed certification costs) were similar for both groups, mainly because of price premiums received by organic farmers. If certification costs are considered, then net income for organic farmers was significantly lower than for conventional farmers.

Sáenz Segura, F. and G. Zúñiga-Arias. 2008. "Assessment of the effect of Fair Trade on smallholder producers in Costa Rica: A comparative study in the coffee sector." Chapter 5 in R. Ruben. *The Impact of Fair Trade*. Wageningen Academic Publishers. The Netherlands.

2. **Sector:** Coffee
3. **Category:** A1
4. **Rationale for categorization:** The paper tests for impacts on coffee farm economic characteristics and farmer perceptions of FT certification. It controls for selection bias using the propensity score matching.
5. **Type of certification:** Fair Trade
6. **Study area:** central western Costa Rica
7. **Study years:** 2007
8. **Method of analysis:** The authors use original survey data. Their treatment group consists of producers from one FT cooperatives (Coopemontes de Oro, R.L.) and the control group consists of producers from non-FT cooperatives (Café de Altura, S.A.). Sampling was done using a non-random "snowball" method (asking interviewees to identify other cooperative members). The total sample size is 103 producers. The size of the treatment and control subsamples is not specified. Propensity score matching was used to select the control group. Matching was based on eight characteristics (years living in community, average family education, number of household members, age of household head, educational level of household head, initial access to land, actual coffee area, time from plot to town).

8A. Methodological issues. The members of the treatment group and the control groups are drawn from a different farmer cooperatives. As a result, unobserved factors correlated with cooperative membership, and therefore FT certification, may also be correlated with outcomes. In other words, unobserved factors—not FT certification—likely drive the observed differences between FT and non-FT farmers. For example, authors argue that non-FT farmers have access to three competitive processors/buyers, while FT farmers only have access to one monoposonisitc processor/buyer, also non-FT cooperative is much larger than the FT cooperative.

9. **Findings about impact of certification:** total income, coffee derived income, profits, food expenditure and total expenditure are higher for non-FT farmers. Self consumption expenditure is higher for FT producers. Non-FT farmers perceive their cooperative's performance is better FT farmers, and have higher women participation rates.

Category A2: Does not account for selection bias

Bacon, C. 2005. "Confronting the Coffee Crisis: Can Fair Trade, Organic, and Specialty Coffees Reduce Small-Scale Farmer Vulnerability in Northern Nicaragua?" *World Development* 33(3): 497–511.

2. **Sector:** Coffee
3. **Category:** A2
4. **Rationale for categorization:** The paper analyzes the relationship between coffee (i) certification and (ii) price, quality, and cooperative membership. However, it does not control for selection bias.
5. **Type of certification:** Fair Trade and organic.
6. **Study area:** Nicaragua
7. **Study years:** not specified.
8. **Method of analysis:** Data were collected through a survey applied to 228 randomly selected farmers. Article does not specify number of certified and non-certified farmers. The author used a two-way ANOVA analysis to analyze the impact of altitude and certification on price. Also simply reports average prices received for certified and non certified coffee.

8A. Methodological issues. The statistical analysis of the drivers of coffee prices only controls for one driver other than certification: altitude, which is a proxy for coffee quality. The author does not control for other farm characteristics or any farmer characteristics. No control for sample selection bias.

9. **Findings about impact of certification.** Finds that certified farmers receive higher prices (controlling only for altitude). Non-certified farmers more likely to perceive a risk of losing title to their land. "In conclusion the evidence from this survey suggests that participation in alterative coffee trade networks reduces exposure and thus vulnerability to low coffee prices. The farmers linked to cooperatives selling to alternative markets receive higher average prices and felt more secure on their land tenure." ... "The responses to this question about quality of life [in last few years during the coffee crisis] showed no significant difference between farmers participating in conventional and alternative trade networks. This finding and the results of the focus groups suggest that income from coffee sales to alterative markets in not enough to offset the many other conditions that have provoked a perceived decline in the quality of one's life.

Barbosa de Lima, A., A. L. Novaes Keppe, F. E. Maule, G. Sparovek, M. Corréa Alves, and R. F. Maule. 2009. *"Does certification make a difference?* Impact assessment study on FSC/SAN certification in Brazil. Available at: http://www.imaflora.org/arquivos/Does_certification_make_a_difference.pdf

2. **Sector:** coffee
3. **Category:** A2 qualitative
4. **Rationale for categorization:** The paper analyses the socioeconomic and environmental impacts of certification using qualitative survey data. There is no correction for sample selection.
5. **Type of certification:** Forest Stewardship Council (FSC) forest certification and Sustainable Agriculture Network (SAN) coffee certification
6. **Study area:** Timber: Southern Brazil; Coffee: Cerrado and Southern Minas Gerais
7. **Study years:** 2008
8. **Method of analysis (for coffee):** 8 treatment certified enterprises and 8 control noncertified enterprises. 3 of each category were surveyed from the southern region of Minas and 5 of each category from the Cerrado areas of the State of

Minas Gerais. The treatment enterprises were randomly selected. The noncertified enterprises were randomly selected from a larger set of enterprises that were "similar" according to recommendations by experts in the region. Enterprises are one or more farms under a single administration. Data sources were field observations, satellite images, interviews with structured questions. The following variables were analyzed: environmental preservation, safety in the workplace, professional training, working conditions, hiring, access to education and health services, social organization, and relationship with the community.

8A. **Methodological issues.** (A) no control for sample selection (B) many enterprises have multiple certifications (C) data collected at different times of the year for different enterprise. Note that this report is from a Brazilian nonprofit called Imaflora. It represents an effort to establish a method for evaluating the socioeconomic impact of certification.

9. **Findings about impact of certification:** The SAN certification has a significant impact. "The results revealed that the SAN Certification generated positive impacts in relation to training and qualification; protection of Permanent Protection Areas; reforestation with native species; registration of Legal Reserves; use of less toxic pesticides and fertilizers; storage of pesticides and fertilizers; proper use of individual protection equipment; proper disposal of water, sewage and garbage; and workers' health, among others."

Consumers International and the International Institute for Environment and Development. 2005. "From bean to cup: How consumer choice impacts upon coffee producers and the environment." December. Available at: http://www.consumersinternational.org/Shared_ASP_Files/UploadedFiles/FD-B0EF2D-14FE-4558-B219-A7FD81E089FB_CIcoffeereport.pdf

2. **Sector:** Coffee
3. **Category:** A2
4. **Rationale for categorization:** Focus on both environmental and social impacts of certification. No control for self-selection bias.
5. **Type of certification:** Brazil: Fair Trade, organic, Utz Kapeh and Rainforest Alliance. Vietnam: Utz Kapeh.
6. **Study area:** São Paulo State in Brazil and Vietnam
7. **Study years:** 2005
8. **Method of analysis:** Brazil: Survey of 28 certified farms. These included 2 of the Brazil's largest coffee estates, 6 smallholders and 8 randomly selected medium farms. 10 conventional coffee producers were also surveyed. Vietnam: not clear that a survey was conducted, or whether based on secondary data? No statistical analysis presented. Conclusions for both Brazil and Vietnam based on ad hoc assessment of interview data.
9. **Findings about impact of certification:** Brazil: As result of certification revenues increased and access to new markets was facilitated. Fair Trade certified producers report higher and more stable prices. Organic certification also increased producer's revenue. Price differential respect to traditional coffee was biggest during low price years. Utz Kapeh and Rainforest certification seals also implied higher prices. Non-financial benefits, such as training for workers, have been perceived mainly by medium and large producers. Main impacts on local environment are improvement of treatment and recycling of water used in the processing of coffee and reduced use of agrochemicals.

   Vietnam: evidence is very limited because certification is so new and only one scheme, Utz Kapeh, has any presence. Only state-owned companies have been certified. Costs of certification exceed the premiums.

Jaffee, D. 2008. "Better, but not great: The social and environmental benefits and limitations of Fair Trade for indigenous coffee producers in Oaxaca, Mexico." Chapter 9 in R. Ruben. *The impact of Fair Trade*. Wageningen Academic Publishers. The Netherlands.

2. **Sector:** Coffee
3. **Category:** A2
4. **Rationale for categorization:** The study compares socioeconomic and environmental characteristics of members of a FT/organic certified farmers and those of noncertified coffee farmers. It does not controls for selection bias.
5. **Type of certification:** Fair Trade (FT)
6. **Study area:** Oaxaca, México.
7. **Study years:** 2001-2005.
8. **Method of analysis:** Data collected from a survey of 51 coffee farm households, of which 26 belong to a FT/organic certified cooperatives (Michiza and CEPCO) and 25 of which are not certified (either

unorganized or members of CNC/Fraternal). Sampling was done using a combination of random and snowball methods. Socioeconomic characteristics are compared using t-tests and 1-way ANOVA. Characteristics include household income and debt, labor cost, education level, food security and environmental practices.

8A. **Methodological issues.** No correction for sample selection.

9. **Findings about impact of certification:** FT producers receive a higher price for their coffee. However, there are not big differences in family wealth and demographic characteristics between FT and non-FT producers. (note that coffee income is less than half total income of the families and only 12 of the 51 families interviewed have a positive net income). A smaller proportion of FT producers are in debt. The amount and cost of hired labor is higher among FT farmers. A higher proportion of non-FT farmers say they suffer food shortages and the share of food expenditure in their total expenses is higher. Migration variables indicate that more certified farming families have relatives migrating to the US and other areas in Mexico. FT farmers obtain better productivity rates. FT farmers adopt more soil conservation practices, and are less likely to say they will clear tree cover to engage in row agriculture or livestock activities. As for perceptions of the value of certification, most respondents said FT farmers were "a little better off" not "much better off." In final analysis, author concludes that although FT certification provides some benefits, they are insufficient to drive further participation in FT certification, much less mitigate economic and environmental issues.

Kilian, B., C. Jones, L. Pratt, and A. Villalobos. 2004. "Can the private sector be competitive and contribute to development through sustainable agricultural business? A Case study of coffee in Latin America." *International Food and Agribusiness Management Review* 7 (3): 21-45.

2. **Sector:** Coffee
3. **Category:** A2
4. **Rationale for categorization:** The paper analyzes price premiums for different sustainable certifications. It also models average profits of 3 organic certified and 2 noncertified farms, but do not control for selection bias.
5. **Type of certification:** Organic, Fair Trade, Rainforest Alliance, and Utz Kapeh.
6. **Study area:** Latin America
7. **Study years:** 2004
8. **Method of analysis:** Compares price premiums for different types of certified coffee across countries. Constructs simple spreadsheet simulations of profits for 3 specific organic certified and 2 noncertified farms in Costa Rica. Then extrapolates to different types of certifications (Utz Kapeh, RA) based on price and cost information for these certifications.

8A. **Methodological issues.** This paper does not purport to rigorously estimate impacts. Rather draws broad conclusions based on an array of data.

9. **Findings about impact of certification:** "… certification alone does not generate price differentials (with the notable exception of organic coffee sold in Europe). The price is always a product of both quality and certification, where quality can be seen as a more basic prerequisite for a price premium and the certification as a tool to differentiate and to underline the outstanding performance of the product." Average price premiums have been higher for Fair Trade certified coffee followed by organic certified coffee, Rainforest Alliance and Utz Kapeh. Brazil, Colombia, Costa Rica and Guatemala receive the highest average price premiums (more than 40 cents/lb) Bolivia, Ecuador and Peru receive the lowest price premium (less than 20 cents/lb). Costa Rica has the highest production costs (due to labor costs) followed by Guatemala (more than $2000/ha), Honduras and El Salvador (less than $1500/ha).

Martínez-Sánchez, J.C. 2008. "The role of organic production in biodiversity conservation in shade coffee plantations." Ph.D. Dissertation. University of Washington, USA.

2. **Sector:** Coffee
3. **Category:** A2
4. **Rationale for categorization:** Focuses on impact of certification on various ecological indicators on a sample of Nicaraguan farms. Does not correct for sample selection
5. **Type of certification:** organic
6. **Study area:** Nicaragua
7. **Study years:** 2007
8. **Method of analysis:** Compared ecological indicators on 10 certified organic and 10 non-certified farms. (A) shade cover. Selected 10 certified organic and 10 non-certified farms in northern Nicaragua. Matching was limited: "Farm

pairs were of similar sizes and located within a short distance of each other. No other prior information was used in selecting pairs." (B) bird biodiversity. Selected 10 farms: 4 certified organic, 4 non-certified farms, and 2 farms in transition in Pacific slope of Nicaragua. Presumably, matching was limited. (C) Attitudes and perceptions. Interviewed farmers, technicians in two coffee growing regions of the northern highlands, and government policy makers.

9. **Findings about impact of certification:** "… organic certification per se does not affect tree cover composition on shade levels." "…bird diversity and abundance were not influenced by pesticide use in conventional plantations but were related to tree canopy structure and composition." From the survey, conventional and organic coffee growers agree on the environmental benefits of growing coffee under shades and preserving forests. "Results indicate that priority be given to encourage farmer to grow coffee under diverse shade. Strict organic standards should not be a prerequisite to certify coffee as bird-friendly.

Millard, E. 2006. "Increasing profitability for farmers supplying to the international coffee market by improving supply chain management, including traceability." USAID. Regional Consultation on Linking Farmers to Markets: Lessons Learned and Successful Practices. January. Cairo, Egypt. http://www.globalfoodchainpartnerships.org/cairo/papers/EdwardMillardCoffee.pdf

2. **Sector:** Coffee
3. **Category:** A2
4. **Rationale for categorization:** This article evaluates the impact of a certification project by comparing quantitative impact indicators for participants and nonparticipants. However, the article does not control for sample selection.
5. **Type of certification:** Starbucks Coffee and Farmer Equity Practices (C.A.F.E.)
6. **Study area:** Chiapas, Mexico.
7. **Study years:** 1999-2004
8. **Method of analysis:** Case study. The paper evaluates a project between Conservation International, Starbucks, the United States Agency for International Development, and local cooperatives from Chiapas, Mexico.
9. **Findings about impact of certification:** Compared to non-certified farm households, certified households had higher coffee productivity, received higher average prices, were more profitable, had higher incomes and consumed more meat.

Philpott, S., P. Bichier, R. Rice, and R. Greenberg. 2007. Field testing ecological and economic benefits of coffee certification programs. *Conservation Biology* 21(4): 975-985.

2. **Sector:** Coffee
3. **Category:** A2
4. **Rationale for categorization:** Evaluates the impact of a certification project by comparing quantitative impact indicators for certified and noncertified farms. However, the article does not control for sample selection.
5. **Type of certification:** Fair Trade and organic.
6. **Study area:** Chiapas, Mexico.
7. **Study years:** 2004-2005
8. **Method of analysis:** This paper evaluates the environmental and economic impact of a certification project by comparing quantitative impact indicators for certified and noncertified farms. authors collected farm-level ecological and socioeconomic data from a sample of eight small farm cooperatives in Chiapas Mexico. Of these eight cooperatives, three were organic certified, three were both organic and fair trade certified, and two were uncertified. No effort was made to match the various types of farms to construct a counterfactual.
9. **Findings about impact of certification:** The authors find no differences among the different farm types in ecological characteristics (ant and bird species richness). Farms that were organic certified, and those that were both organic and fair trade certified had more land under cultivation and in some cases higher revenue than uncertified farms.

Quispe Guanca, J. L.. 2007. "Caracterización del impacto ambiental y productivo de las diferentes normas de certificación de café en Costa Rica." Master's thesis. Centro Agronómico Tropical de Investigación y Enseñanza (CATIE) http://orton.catie.ac.cr/repdoc/A1725e/A1725e.pdf

2. **Sector:** Coffee
3. **Category:** A2
4. **Rationale for categorization:** This thesis examines the environmental impact of different

certification seals used in coffee production. It uses before-after comparisons to identify impacts. It does not use a control group.

5. **Type of certification:** Organic, Fair Trade, Rainforest Alliance, Utz Kapeh, C.A.F.E. Practices
6. **Study area:** Costa Rica
7. **Study years:** 2007
8. **Method of analysis:** The study analyzed environmental practices on 106 certified coffee farms in different regions of Costa Rica. It did not analyze non-certified farms. Most farms had only one certification stamp, for those with more than one seal, the oldest one was considered. Interviews was conducted to asses the management before and after certification. The following environmental and management index were evaluated in areas of 1,000 m^2: shade, soil erosion, pest incidence and diseases, land cover and biodiversity.

8A. **Methodological issues.** Did not use a control group.

9. **Findings about impact of certification:** "The main impact on farming practices observed for all seals was a decrease in the use of herbicides. This was more evident in organic farming where herbicides are not used anymore and manual weed control increased up to two and three per year.

   In general, the Utz Certified farms, Fair Trade and C.A.F.E Practices did not reduce their agrochemical applications with the exception of the Rainforest Alliance farms that reduced the use of synthetic fertilizers and increase the use of organic fertilizer. Farming practices such as pruning have no changes in frequency due to certification with the exception of organic farming, where a decrease in farming practices was observed.

   As a result, the organic farms presented phytosanitary problems as well as weaker coffee plants. Disease incidence did not reach critical levels with the exception of the organic farms that presented high incidence of Hemileia vastatrix, and C.A.F.E Practices farms presented high levels of Mycena citricolor what can also be explained with the different agroclimatic conditions that each seal is used (organic < 1000 and CAFE Practices > 1200 meters over sea level).

   The farms that presented an adequate percentage shade were Utz Certified and Fair Trade in contrast to Rainforest Alliance (7%), C.A.F.E Practices (21%) and conventional (7%) farms that presented lower percentages. Fair Trade farms had the higher Shannon Index for tree diversity (2.47). Coffee farmers are satisfied with the certification because of the accomplished changes in their farms but they are discouraged with the certified coffee price."

Raynolds, I., D. Murray, and P. Taylor. 2004. Fair Trade Coffee: Building Producer Capacity via Global Networks. *Journal of International Development* 16: 1109-1121.

2. **Sector:** Coffee
3. **Category:** A2
4. **Rationale for categorization:** Evaluates the impact of Fair Trade certification by seven certified coffee cooperatives in Latin America. Does not include a control group.
5. **Type of certification:** Fair Trade (FT)
6. **Study area:** Mexico, El Salvador and Guatemala
7. **Study years:** unclear
8. **Method of analysis:** This paper presents a qualitative analysis based on field research on seven certified coffee cooperatives in Mexico, El Salvador and Guatemala. It focuses on factors that drive participation in FT certification, and the benefits of certification to producers.
9. **Findings about impact of certification:** Finds that FT certification provides important benefits to producers organizations, communities and households. Finds that "while the financial benefits of FT appear the most important in the short run, it is the capacity building nature of FT that will prove the most important in fueling sustainable development in the long run."

Ronchi, L. 2002. The Impact of Fair Trade on Producers and their Organizations: A case study with Coocafé in Costa Rica. Policy Research Unit. Sussex: University of Sussex.

2. **Sector:** Coffee
3. **Category:** A2
4. **Rationale for categorization:** Evaluates the impact of a certification project by collecting data on certified farmers only.
5. **Type of certification:** Fair Trade (FT)
6. **Study area:** Western Costa Rica (Guanacaste)
7. **Study years:** 1989-1999
8. **Method of analysis:** This article examines the socioeconomic impact of FT certification on Coocafé, a consortium of nine cooperative in western Costa Rica (Guanacaste). Impact is defined to include (i) direct effects of FT price premiums on producers, (ii) direct effects of price premiums

on Coocafé and cooperative, (iii) indirect effects of Coocafé on producers, (iv) indirect effect of Coocafé on cooperatives. The period of study is 10 years: 1989 (when Coocafé was founded) to 1999. Impact is measured qualitatively based on data from field interviews with representatives of Coocafé, representatives of the cooperatives, and with producers. No control group.

9. **Findings about impact of certification:** FT support of the initial and continued viability of Coocafé has been effective. This consortium has gained strength and autonomy. Producers conditions improved during the study period. However, they have low awareness of FT. They are aware of superior price conditions and improved services.

Valkila, J. 2009. Fair Trade organic coffee production in Nicaragua: Sustainable development or a poverty trap? *Ecological Economics* 68: 3018-3025.

2. Sector: Coffee

3. Category: A2

4. Rationale for categorization: Evaluates the impact of FT certification on coffee farmers in Nicaragua by comparing estimated profits for certified and noncertified producers. Does not control for self-selection bias.

5. Type of certification: Fair Trade (FT)

6. Study area: Nicaragua

7. Study years: 2005-2008

8. **Method of analysis:** The article evaluates impacts of FT certification on coffee producers in Nicaragua by comparing estimated profits based on interviews with 120 small scale farmers including 55 that were both organic and FT certified, 16 organic certified, 39 FT certified, and 10 noncertified.

9. **Findings about impact of certification:** FT organic production raises farmer income when the alterative to this dual certification is low-intensity conventional coffee farming. "However, low intensity farming produces very little coffee in the case of most marginalized farmers, keeping these farmers in poverty."

CATEGORY B: NOT FOCUSED ON IMPACT BUT RELEVANT

Calo, M. and T.A. Wise. 2005. "Revaluing peasant coffee production: Organic and Fair Trade markets in Mexico." Global Development and Environment Institute, Tufts University. October.

2. Sector: Coffee

3. Category: A2

4. Rationale for categorization: This paper evaluates whether price premiums paid to organic and Fair Trade (FT) certified coffee are enough to cover for the costs associated to certification. A comparison with traditional coffee growers is made however it does not control for counterfactual selection. Its not clear that the study is based on farm-level survey data.

5. Type of certification: Organic and Fair Trade

6. Study area: Mexico, Oaxaca.

7. Study years: 2003-2004

8. **Method of analysis:** Developed simple spreadsheet (farm budget) simulation models for assuming (i) conventional non-certified production, (ii) organic certified production, and (iii) fair trade certified production (iv) in-transition to organic certification. Additional model for a specific state-wide cooperative (CEPCO) and assuming participation in an government price-support program. Data used to parameterize models collected on site in the summer of 2004.

8A. (A) Does not control for self-selection. (B). Not clear how data collected (i.e., random or non-random survey)

9. **Findings:** Price premiums paid to organic coffee growers generally failed to cover the added costs associated with organic certification and maintenance assuming market rates for labor. The additional investment in labor associated with organic production is seldom compensated by the price premium paid to organic coffee. FT on the other hand, does cover the extra costs associated to certification. This is due to the facts that transition and certification costs are low and the price premium obtained by FT certified producers is high, even reaching a three times fold the price paid to conventional coffee. One of the main advantages of organic certification is the benefit of having a strong producer organization: access to credit and government programs, etc.

Gobbi, J. 2000. Is biodiversity-friendly coffee financially sustainable? An analysis of five different coffee production systems in western El Salvador. *Ecological Economics* 33: 267-281.

2. **Sector:** Coffee
3. **Category:** A2
4. **Rationale for categorization:** Evaluates the hypothetical financial impact of certification by constructing farm budget simulation models for five different types of
5. **Type of certification:** Hypothetical biodiversity friendly certification
6. **Study area:** Western El Salvador
7. **Study years:** n/a
8. **Method of analysis:** Evaluates the hypothetical financial impact of certification by constructing farm budget simulation models for five different types of coffee farms (i) traditional polyculture, (ii) commercial polyculture, (iii) technified shade less than 1200 meters in elevation, (iv) technified shade greater than 1200 me elevation, (v) unshaded monoculture. The paper uses Monte Carlo simulation to incorporate risk for the production and price variables. Certification is a set of hypothetical criteria based on a Ministry of Environment workshop on certification.
9. **Findings about impact of certification:** Certification is profitable for all five types of coffee producers. Although capital requirements are low, small, cash poor farmers will need assistance to pay fixed certification costs.

Kilian, B., C. Jones, L. Pratt, and A. Villalobos. 2003. "The value chain for organic and Fair Trade products and its implication on producers in Latin America." Available at: http://www.ifama.org/tamu/iama/conferences/2005Conference/Papers&Discussions/1042_Paper_Final.pdf

2. **Sector:** Coffee
3. **Category:** A2
4. **Rationale for categorization:** The paper analyzes prices at different levels of the value chain of certified bananas and coffee in Latin America and the Caribbean. The analysis relies on historical data collected either by personal interviews and surveys. It does not control for selection bias.
5. **Type of certification:** organic and Fair Trade
6. **Study area:** Costa Rica and Ecuador for bananas.
7. **Study years:** 1990-2005.
8. **Method of analysis:** Data analyzed include prices along the value chain (producer - exporter - importer - wholesaler - retailer). Data were collected using a market survey in the case of producer prices (500 producers in LAC), personal interviews for exporters and wholesalers prices and direct visits to supermarkets to obtain retailer prices. Prices for certified products are compared to prices of non-certified products. Also, a partial equilibrium model (the authors called it a general market model) is built to determine what happens to sustainable good producer's income while setting minimum prices.
9. **Findings:** Fair Trade bananas: both in Ecuador and Costa Rica are set above the average FOB prices of the period 1990-2005. Prices of organic bananas are also higher than traditional FOB prices but the price premium has decreased over the years. Organic production has become less profitable and as a consequence banana producers tend to obtain Fair Trade certification. In Europe, fair trade prices are higher than organic and conventional prices at all but at the consumer level. In the US on the other hand, this is also true but for organic bananas. Prices in Europe are higher than in the US along the entire value chain due to the import regime ruling the EU banana market.

   Fair trade coffee: Fair Trade minimum price is set at the regional level (not at the national level as in the case of bananas). Conventional coffee prices have exceeded the minimum Fair Trade prices. Fair Trade production is not economically competitive even under a price premium of up to 15 cents/pound due to certification costs and increased production costs. Prices of organic coffee are more correlated to conventional market prices. However, there are price differences among regions due to quality and flavor characteristics. "*As a consequence, observed price premiums covered a wide range, starting from only 5 cents/lb and going up to 150 cents/lb, with an average price premium of around 20 cents/lb.*" The highest price difference between conventional, Fair Trade, and organic coffee are at the consumer level. In the US, fair-trade coffee has higher prices at all levels while in Europe, Fair-Trade coffee has higher prices at the farmer, exporter, and toaster levels but at the consumer level. Finally, based on the market model "price distortions along the trade channels can risk the benefits of Fair Trade certification and, in general, of sustainable production. In order to really create a benefit for the production sector, the solidarity of all participants along the trade channel is needed."

Muradian, R. and W. Pelupessy. 2005. "Governing the coffee chain: The role of voluntary regulatory systems." *World Development* 33(12): 2029–2044, 2005.

2. **Sector:** Coffee
3. **Category:** B1b.
4. **Rationale for categorization:** Although the paper does not measure/identify direct impacts of certification, it is relevant because it tries to draw conclusions regarding governance of the coffee chain under different certification schemes. Conclusions are solely based on qualitative information.
5. **Type of certification:** COFFEE Starbucks, Sustainable Agriculture Information (SAI) Platform, Fare Trade, Organic, Shade Grown, Utz Kapeh,
6. **Study area:** World
7. **Study years:** not specified.
8. **Method of analysis:** "This article analyses the advantages and limitations of some of the voluntary regulatory schemes applied to the coffee sector, as well as their impact on the governance structure of the chain and their implications for farmers' upgrading."
9. **Findings about impact of certification:** "Participation in these systems does not ensure a better economic performance, but it may facilitate coordination between roasters/traders and some growers, which may lead to upgrading opportunities."

Ponte, S. 2004. "Standards and sustainability in the coffee sector." International Institute for Sustainable Development. 2004. Available at: http://www.iisd.org/

2. **Sector:** Coffee
3. **Category:** B2
4. **Rationale for categorization:** the paper does not focus on impact as it does not compare conventional and certified production/commercialization schemes. Instead it compares 3 different certification seals.
5. **Type of certification:** Utz Kapeh, Organic, Fair Trade, Shade grown.
6. **Study area:** none specific
7. **Study years:** none specific
8. **Method of analysis:** evaluation of different characteristics of the 4 certification seals.
9. **Findings about impact of certification:** Fair trade is the certification scheme that pays the highest price premium. Fair trade is also the one that benefit the most producer's income due to the price premium, farmers do not pay for certification and do not have to make significant production changes. "In the case of organic and shade-grown certifications, spill-over effects have been observed on adjacent communities—in terms of improving both farming practices and coffee quality." The paper also presents a list of benefits perceived by certified producers under different schemes. The authors also identify the existence of economies of scale derived from seeking multiple certifications.

Potts, J. 2007. "Alternative trade initiatives and income predictability: Theory and evidence from the coffee sector" International Institute for Sustainable Development.

2. **Sector:** Coffee
3. **Category:** A2
4. **Rationale for categorization:** An economic model is used to explain possible prices differences between certified and conventional coffee. Then, anecdotal evidence is used to validate the model.
5. **Type of certification:** Fair Trade, organic, Rainforest Alliance, and Utz Kapeh.
6. **Study area:** None in particular; data from Nicaragua and Dominican Republic.
7. **Study years:** ??
8. **Method of analysis:** The paper analyses the impact of 4 different certification seals on producer's income using the following equation: $Y_S = P_S*Q_S-C_S$ where Y = farm income, P = coffee price, Q = production volume, C = production cost and S indexes sustainable coffee production. The focus is on price volatility. A partial equilibrium approach is used to simulate market behavior under each certification scheme to draw theoretical conclusions on the impact of certification on farmer's income.
9. **Findings about impact of certification:** Price volatility is reduced through participation in eco-labeling programs. Fair Trade has the greatest effect due to its policy of setting minimum price. The stabilizing impacts of "sustainability label on actual producer (farm gate) prices is (currently) significantly reduced, due to the fact that typically only a small percentage of total coffee produced is actually sold through one or another labeling system… On the other hand, the price stabilizing impacts of production for standards-based markets without specific minimum price criteria, can be expected to decrease as the size of the global labeled market grows (e.g., becomes mainstream)."

TransFair USA, 2006. "2005 Fair Trade Coffee Facts and Figures." http://www.transfairusa.org/content/Downloads/2005Q2FactsandFigures.pdf

2. **Sector:** coffee
3. **Category:** B2a.
4. **Rationale for categorization:** The paper gives data on Fair Trade coffee trade flows, market share, additional income certified coffee growers receive, quantity of farmers exporting to the US by country of origin.
5. **Type of certification:** Fair Trade
6. **Study area:** USA
7. **Study years:** 1998-2005
8. **Method of analysis:** Time series data trend analysis
9. **Findings about impact of certification:** NA

TransFair USA. 2008. "Coffee: Imports of fair trade certified coffee into the US."

2. **Sector:** Coffee
3. **Category:** B2a
4. **Rationale for categorization:** The paper does not evaluate impact of Fair Trade coffee but rather gives figures on the quantity of certified coffee imported into the US.
5. **Type of certification:**
6. **Study area:** US
7. **Study years:** 2003-2007
8. **Method of analysis:** Trend discussion. The authors present the data and a brief description of what has happened over the period analyzed.
9. **Findings about impact of certification:** NA

III. FISH AND SHRIMP

CATEGORY A: FOCUS ON IMPACT

Category A1: Accounts for selection bias

None

Category A2: Does not account for selection bias

Hicks, Robert L., Kurt E. Schnier. 2008. Eco-labeling and dolphin avoidance: A dynamic model of tuna fishing in the Eastern Tropical Pacific. *Journal of Environmental Economics and Management* 56(2): 103-116.

2. Sector: Fish

3. Category: A2

4. Rationale for categorization: The paper assesses the impact dolphin-safe tuna certification had upon the environmental performance of U.S.-flagged fishing boats in the Eastern Tropical Pacific. This certification became mandatory in 1990, so the usual problem of voluntary selection into the program is moot. However, fishermen could still self select our of the fishery and the authors do no control for this type of bias. Also, contemporaneous cofounders could alter outcome measures. The authors explicitly state that the variables in their model, including dolphin-safe certification, are "assumed to evolve in a deterministic and non-endogenous way" (108).

5. Type of certification: Dolphin-safe

6. Study area: Eastern Tropical Pacific

7. Study years: 1980 – 1992

8. Method of analysis: The paper purports to identify the environmental impact of the dolphin-safe tuna label by analyzing changes in fishing techniques (whether to use dolphins, which are relatively easy to spot, to find schools of tuna) as well as changes in fishermen's willingness to pay for dolphin-safe tuna. To identify impact, 1990-92 U.S. fleet fishing behavior is compared to baseline behavior prior to the implementation of dolphin safe certification mandate (1980-81). The evaluation uses historical fishing behavior as well as documented fishing costs and certification costs to create a dynamic random utility model. (Note that the article's focus was improving dynamic random utility modeling techniques).

8A. Methodological issues. See above.

9. Findings about impact of certification: Results suggest that U.S. flagged boats significantly changed their fishing techniques and were willing to pay "large amounts to expand fishing grounds where they could catch dolphin-safe tuna."

CATEGORY B: NOT FOCUSED ON IMPACT BUT RELEVANT

Erwann, C. 2009. Eco-labeling: A new deal for a more durable fishery management? *Ocean & Coastal Management* 52(5): 250-257.

2. **Sector:** Fish
3. **Category:** B
4. **Rationale for categorization:** This article discuses fishery certification and analyses the economic implications mostly focusing on consumer willingness to pay. However, it includes a discussion of one specific fishery: a bass fishery in France.
5. **Type of certification:** Multiple
6. **Study area:** Global (although the relevant case study was of the bass fishery in Northern France)
7. **Study years:** Not-specific
8. **Method of analysis:** The case study was highly anecdotal and qualitative. The author provided an overview of the bass fishery in Northern France and then discusses the motivations for the adoption of certification.
9. **Findings about impact of certification:** The study was not specifically focused on certification impacts and, in its assessment of such impacts, did not construct a counterfactual. That said, the authors speculate (based on their assessment of willingness to pay and review of previous studies) that bass certified in France may have enjoyed a price premium of approximately double that of other bass and that this may have induced a change in fishing behavior that resulted in a positive feedback on fish stocks.

Garddiner P.R., K. Viswanathan. 2004. Eco-labeling and fisheries management. *World Fish Center Studies and Reviews* 27:44.

2. **Sector:** Fish
3. **Category:** B
4. **Rationale for categorization:** This article provides a qualitative analysis of eco-labeling in the fishing sector but also presents a case study of a Hake fishery in New Zeland in which the authors outline how certification may have contributed to an increase in environmental management. The study is not specifically focused on certification impacts and does not construct a counterfactual.
5. **Type of certification:** MSC among others
6. **Study area:** Global
7. **Study years:** Not specific
8. **Method of analysis:** The paper begins by providing a comprehensive overview of eco-labeling and its application to global fisheries. The paper then presents a case study of the hake fishery in New Zealand and argue that—although it may be difficult or impossible to quantify the exact benefits of the certification scheme—certification may have contributed to the development of a more holistic approach to ecosystem management, a conclusion that is not based on a systematic comparison. The paper then delineate current certification trends on a global level, paying particular attention to the developing nations).
9. **Findings about impact of certification:** The authors speculate that in the case of the hake fishery, the greatest environmental contribution of certification was helping to initiate a paradigmatic shift in management, from a species-specific approach to an eco-system wide approach. Other conclusions relate to how certification may be applied to developing nations. Due to public sentiment, it may be easier to enact an environmentally and economically efficient certification scheme for species such as dolphin or sea turtles, which are iconic species than it would be for commercial species such as tuna.

Gulbrandsen, L. H. 2009. The emergence and effectiveness of the *Marine Stewardship Council, Marine Policy* 33(4): 654-660.

2. **Sector:** Fish
3. **Category:** B
4. **Rationale for categorization:** The study was not specifically focused on certification impacts and does not provide evidence based on an adequate counterfactual.
5. **Type of certification:** Marine Stewardship Council (MSC)
6. **Study area:** Global
7. **Study years:** not specific
8. **Method of analysis:** This article provides an overview of Marine Stewardship Council (MSC) certification on a global level and how it has been applied and adopted by local communities. It specifically discusses environmental benefits of MSC certification. However, it is unclear exactly how these benefits were calculated, specifically

whether the analysis gave consideration to the counter factual. The authors make note that in calculating benefits, they partnered with a UK based fisheries consultancy. These benefits may (or may not) have been calculated and compared against historical figures. When analyzing the adoption of MSC, the authors note that there were problems with self selection bias in the fisheries currently MSC approved (i.e. fishermen with the lowest costs and potentially lowest environmental benefits would chose to be certified).

9. **Findings about impact of certification:** The article speculates that MSC certification has had very limited environmental benefits. The only "direct environmental benefit" is reduced by-catch of endangered sea birds in South Georgia Patagonian toothfish fishery. The article notes that due to the flexibility of global MSC standards, there may be significant variations in the environmental performance of MSC fisheries on a global level. Furthermore, currently almost all MSC certified fisheries are in developed nations and very little money or effort is being spent on increasing the adoption of certification in developing nations.

Ponte, S. 2007. Greener than thou: The political economy of fish ecolabeling and its local manifestations in South Africa. *World Development* 36(1): 159-175.

2. **Sector:** Fish
3. **Category:** B
4. **Rationale for categorization:** The study was not specifically focused on certification impacts and does not provide evidence based on an adequate counterfactual.
5. **Type of certification:** Marine Stewardship Council (MSC) certification of Hake
6. **Study area:** South Africa
7. **Study years:** 2005 - 2006
8. **Method of analysis:** This article discusses the adoption of Marine Stewardship Council (MSC) certification by the South African Hake fishery. It discusses the historical precedents and documented motives for certification. The authors also document some perceived socio-economic and environmental benefits from certification. However, they do not construct a counter factual and results are mostly anecdotal.
9. **Findings about impact of certification:** The authors argue that there have been few commercial benefits of certification. Certified hake does not command any significant price premium. Furthermore, there has been few improvements to the vitality of the hake fishery: annual catch is still near historic lows and the population of Hake has not significantly increased. However, certification may have succeeded in concentrating the fishing rights in the hake fishery in the hands of a limited number of large fishing enterprises. Additionally, certification may have aided in preventing more of the total allowable catch from being allocated to long line fishers.

IV. TIMBER

CATEGORY A: FOCUS ON IMPACT

Category A1: Accounts for selection bias

de Lima, A. C. B., A. L. Novaes Keppe, M. Corrêa Alves, R. Fernando Maule, and G. Sparovek. 2008. Impact of FSC forest certification on agroextractive communities of the state of Acre, Brazil. Instituto de Manejo e Certificação Florestal e Agrícola (Imaflora), University of São Paulo (USP), Entropix Engineering Company.

2. **Sector:** Timber
3. **Category:** A1 (moved from A2 December 09)
4. **Rationale for categorization**: Assesses socio-economic and environmental impacts of timber certification in timber producing communities with Brazil. It uses a matched control group of noncertified timber producing associations to control for self selection bias.
5. **Type of certification:** Forest Stewardship Council (FSC) certification
6. **Study area:** Highland natural forests of the Brazilian Amazon region
7. **Study years:** 2007
8. **Method of analysis:** Six forest associations took part in the study. Among these six associations four were FSC certified and comprised the treatment group. Two were not certified and comprised the control group. These control associations were selection on the basis of three criteria: (i) use of community forest management practices; (ii) logging for wood production as the main forest management activity; (iii) land tenure characteristics. Each of the six associations in the study were, in turn, comprised of 4-18 "community operations" such as timber extractors, brazil nut extractors, and copaiba oil extractors. Five different questionnaires were prepared for: the director/president of a certified timber association; the managers of certified timber associations; the director of non-certified timber associations; the managers of non-certified timber associations; and the forest management technicians working with community operations in question. The questionnaires focused on issues related to the environmental and socioeconomic impacts of certification. There was some attempt to control for seasonal effects in the interview dates.

8A. **Methodological issues.** The analysis relied on only three community characteristics to construct a matched sample.

9. **Findings about impact of certification:** The article concludes that the environmental and socioeconomic impacts from certification were small. The authors hypothesize that in their sample, many of the benefits that certification might have had were already being realized through community forest management (CFM). Certification may have had indirectly positive environmental effects by promoting CFM and encouraging the adoption of CFM practices further up the production chain. Due to lack of data, little can be concluded regarding the economic impact of certified wood. However, some communities reported difficulty in accessing the market for certified wood.

Category A2: Does not account for selection bias

Ebeling, J., M. Yasue. 2009. The effectiveness of market-based conservation in the tropics: Forest certification in Ecuador and Bolivia. *Journal of Environmental Management* 90(2): 1145-1153.

2. **Sector:** Timber
3. **Category:** A2
4. **Rationale for categorization:** Article qualitatively analyzes impacts of Forest Stewardship Council (FSC) timber certification in Bolivia and Ecuador using a survey of timber producers and government officials in those countries. It does not attempt to control for self-selection into FSC certification.
5. **Type of certification:** Forest Stewardship Council (FSC)
6. **Study area:** Quito, Ecuador and Santa Cruz, Bolivia
7. **Study years:** 2005
8. **Method of analysis:** Conducted 78 semi-structured interviews with key stakeholders in Ecuador and Bolivia including: 6 certified and 9 non certified timber companies; 7 certified and 7 noncertified communal landowners; 4 business associations; 9 NGOs; 3 development assistance agencies; 7 forest government agencies, 2 national FSC initiatives; and 4 external experts.
9. **Findings about impact of certification:** Results were mostly qualitative. Illegal logging and lack of enforcement in Ecuador prevented most potential benefits of certification from being realized. Bolivia, by contrast has a much more successful certification operation, with much stricter regulation and enforcement. Furthermore, due to the large export market for Bolivian certified wood, there is increased external pressure to enforce certification. The authors concluded that certification faces big challenges in countries with limited governance capacity. It is likely to be more successful where governments enforce forestry laws, provide financial incentives for certified forestry, and provide land tenure security, and where large-scale and vertically integrated forestry operations are commercially feasible. Thus, there are few developing nations that are currently able to successfully implement timber certification standards.

Kukkonen, M., H. Rita, S. Hohnwald, A. Nygren. 2008. Treefall gaps of certified, conventionally managed and natural forests as regeneration sites for Neotropical timber trees in northern Honduras. *Forest Ecology and Management* 255(7): 2163-2176.

2. **Sector:** Timber
3. **Category:** A2
4. **Rationale for categorization:** Quantitative analysis of impacts of timber certification on forest regeneration and biodiversity in Northern Honduras. Uses matching to control construct a control sample of noncertified and natural forest plots
5. **Type of certification:** Forest Stewardship Council (FSC)
6. **Study area:** Northern Honduras
7. **Study years:** 2005
8. **Method of analysis:** This article analyzes forest regeneration and biodiversity in a sample of 46 plots located in one of three types of forest management regimes: certified, conventionally managed, and natural. The authors use regressions to explain the presence and abundance of 10 different native species of trees on the tree fall gaps. The main explanatory variable of interest was a categorical variable indicating management regime on the plot. Control variables includes 11 forest characteristics reputed to affect tree regeneration including altitude, slope, coverage of stones, age and size of tree gaps, coverage of competing species, etc.

8A. **Methodological issues.** The forest management dummy is potentially endogenous selection into certification regime is not random. Rather, land managers select into certain regimes. Also, if prior history of intensive logging affects both selection into FSC certification, and outcomes, then it should be one of the control variables.

9. **Findings about impact of certification:** The results indicate that compared to conventionally managed forest plots, FSC certified forests plots used practices that produce more favorable conditions for the regeneration of trees. Nevertheless, tree regeneration was lower on certified plots than the conventional ones. In all cases, natural forest showed better regeneration than certified and conventional. The authors attribute lower regeneration rates on certified plots to more intensive past logging on these plots.

Madrid, S., and F. Chapela. 2003. Forest certification in Mexico: The cases of Durango and Oaxaca. Annex 3. Case study report prepared for A. Molnar (ed.) *Forest certification and communities: Looking forward to the next decade*. Washington, DC: Forest Trends. http://www.forest-trends.org

2. **Sector:** Timber
3. **Category:** A2b
4. **Rationale for categorization:** This article focuses upon the impacts of timber certification on Mexican forestry industry drawing on qualitative case studies. It does not control for sample selection.
5. **Type of certification:** Not Specific
6. **Study area:** Mexico
7. **Study years:** Not Specific
8. **Method of analysis:** Although the bulk of the article discusses potential medium- to long-term benefits of certification, as well as short-term limitations, it spends some time discussing actual reported benefits (in a qualitative sense) from specific communities around Mexico.
9. **Findings about impact of certification:** The study concludes that actual economic benefits may be small or non-existent in Mexico. However, certification may afford several social benefits. It is seen as a symbol of prestige for the Comisariados and/or managers of the forest community companies. It may help to smooth relations with external agencies that are more concerned with environmentally sound methods of forestry management. Certification may preserve the option of future business if the demand for certified timber increases in the future. Finally, it may provide an external audit of forestry operations that can be used to detect management inefficiencies.

Markopoulos, M. 1998. The Impacts of Certification on Community Forest Enterprises: A Case Study of the Lomerio Community Forest Management Project, Boliva. Oxford Forestry Institute, Oxford. April. Available at: http://www.research4development.info/PDF/Outputs/Forestry/R7285Impacts_of_Certification_on_community_forest_enterprises.pdf

2. **Sector:** Timber
3. **Category:** Category A2

   - Selection Bias:
4. **Rationale for categorization:** Presents a case study of the socioeconomic and environmental impacts of timber certification in Bolivia. However, it does not control for self-selection bias.
5. **Type of certification:** Rainforest Alliance Smart Wood
6. **Study area:** Lomerío region of eastern lowland Bolivia
7. **Study years:** 1997
8. **Method of analysis:** This paper purports to analyze the impact of the certification of the Lomerío Community Forest Management Project, aimed to develop a vertically integrated forest enterprise, which was certified by Rainforest Alliance under their Smart Wood label in 1996. The analysis is based on original interview data that compares forest management, enterprise administration, social relations, distribution of costs and benefits, and national forest policy before certification (a baseline) an after. This study lacks a well-defined control group.
9. **Findings about impact of certification:** The results of the Lomerío project were mixed. Incremental impacts on forest management practices were limited because these practices were already relatively good prior to certification. However, the certification increased emphasis on conservation. Certification was been correlated with price premiums, but these may have been due to improved marketing, and in any case did not translate into higher community incomes. Certification improved community relations, but has not led to expected creation of a formal forest concession.

Morris, M., and N. Dunne. 2003. Driving environmental certification: Its impact on the furniture and timber products value chain in South Africa. *Geoforum* 35(2): 251-266.

2. **Sector:** Timber Products
3. **Category:** A2
4. **Rationale for categorization:** presents an analysis of FSC certification in the South African furniture industry based on interviews with a variety of stakeholders including certified and (unmatched) noncertified producers. There is no attempt to control for selection bias. A qualitative analysis of the economic benefits and costs of certification.
5. **Type of certification:** Forest Stewardship Council (FSC)
6. **Study area:** South Africa
7. **Study years:** Not specific

8. **Method of analysis:** The authors interviewed individuals involved in the furniture industry in South Africa in order to gauge attitudes towards FSC certification and its perceived benefits. The authors delineate many potential economic benefits of the system. The authors then go on to discuss the future of FSC certification in South Africa.
9. **Findings about impact of certification:** Based upon the interviews, the authors conclude that FSC certification does not provide a price premium. However, they remark that attitudes toward certification are not all negative. Some interviewees believed that while certification may not open new doors for business, not having certification may close some. An unexpected benefit which certification has afforded is increased quality control, since all FSC certified furniture must be labeled with the location of manufacture and harvest.

Owari, T., H. Juslin, A. Rummukainen, and T. Yoshimura. 2006. Strategies, functions and benefits of forest certification in wood products marketing: Perspectives of Finnish suppliers. *Forest Policy and Economics* 9(4): 380-391.

2. **Sector:** Timber
3. **Category:** A2
4. **Rationale for categorization:** Case study of economic impact of timber producing companies in Finland. Does not control for self selection bias.
5. **Type of certification:** chain of custody certification from Finnish Forest Certification System.
6. **Study area:** Finland
7. **Study years:** 2003
8. **Method of analysis:** The authors administered a survey to 25 certified and 25 noncertified producers of primary wood products (sawn goods and wood-based paneling) and value-added wood products (engineered wood, furniture, joinery and log houses). The survey included questions about producers' individual characteristics and their perceptions of certification benefits. The authors use difference of means tests to compare results for certified and noncertified companies.
9. **Findings about impact of certification:** The authors conclude that certification is perceived as important for signaling environmental responsibility and maintaining existing market share. Although certified companies reported some benefits, they did not receive significant price premiums and did not believe that certification helped improve financial performance.

Nebel, G., L. Quevedo, J. Bredahl Jacobsen, and F. Helles. 2005. Development and economic significance of forest certification: The case of FSC in Bolivia. *Forest Policy and Economics* 7(2): 175-186.

2. **Sector:** Timber
3. **Category:** A2
4. **Rationale for categorization:** Case study of economic impact of timber certification in Bolivia. It does not address self-selection bias.
5. **Type of certification:** Forest Stewardship Council (FSC) and Rainforest Alliance Smartwood
6. **Study area:** Santa Cruz department in the eastern lowlands of Bolivia
7. **Study years:** 2000 and 2001
8. **Method of analysis:** This article uses statistics on areas and volumes of FSC and Smartwood certification, publicly available reports, and information on export prices of certified and non certified forests to analyze FSC certification in the Santa Cruz Department in the eastern lowlands of Bolivia. The article focuses on the conditions imposed on forest operators to get certified and price premia obtained by certified producers. It uses simple least squares regression analysis to estimate price premiums for certified wood .
9. **Findings about impact of certification:** The authors conclude that certification by itself has only resulted in minor improvements in forest management over a baseline established by preexisting regulation, and that despite certification, deforestation proceeds unabated. Of 13 types of timber products considered, 11 received premiums for certification. However, in cases where premiums existed, they were typically small.

Thornber, K., D. Plouvier, S. Bass. 1999. Certification: Barriers to benefits. A discussion of equity implications. Forest Certification Advisory Group briefing paper.

2. **Sector:** Timber
3. **Category:** A2
4. **Rationale for categorization:** The article considers different reference populations across the globe as well as certified and non-certified producers within a community. Does not address selection bias.

5. **Type of certification:** Forest Stewardship Council (FSC)
6. **Study area:** Global
7. **Study years:** Not Specific
8. **Method of analysis:** This paper draws on secondary data and existing literature to provide a qualitative overview of socioeconomic and environmental benefits timber certification worldwide. This article focusing on the equity implications of certification: which stakeholders gain which benefits.
9. **Findings about impact of certification:** The authors conclude that there are significant equity concerns associated with certification. FSC certification provides the greatest benefits to the largest timber producers and may marginalize smaller, local operations that lack the capital necessary to invest in certification (this is especially pronounced in the tropical regions). In addition, the authors conclude that the actual benefits of certification may be small since most of the adopters of certification standards are those producers with the best environmental records and thus, lowest cost for certification. However, the authors indicate that there may be other environmental benefits of certification—especially in areas where there is management practices are limited—by increasing awareness of environmental concerns, including among producers who do not adopt certification.

CATEGORY B: NOT FOCUSED ON IMPACT BUT RELEVANT

Gullison, R. E. 2003. Does forest certification conserve biodiversity? *Oryx* 37: 153-165.

2. **Sector:** Timber
3. **Category:** B
4. **Rationale for categorization:** Mostly a literature review: presents ex post data from several empirical studies of forest certification, only one of which is original.
5. **Type of certification:** Multiple
6. **Study area:** Global
7. **Study years:** 2003
8. **Method of analysis:** This article presents a qualitative discussion of potential socio-economic and environmental benefits of certification global timber certification based on a review of the empirical literature on certification. Although the article examines certification in a global context, it also discusses trends among regions with significant certification versus little certification.
9. **Findings about impact of certification:** The authors hypothesize that although certification has the potential to provide multiple biodiversity benefits, the only benefit it currently provides is improving management of existing timber production forests during the auditing process. Despite this benefit, the authors conclude certification does not provide enough benefit to avoid large scale deforestation, especially in the tropics.

Kurttila, M., M. Pesonen, J. Kangas, M. Kajanus. 2000. Utilizing the analytic hierarchy process (AHP) in SWOT analysis: A hybrid method and its application to a forest-certification case. *Forest Policy and Economics* 1(1): 41-52.

2. **Sector:** Timber
3. **Category:** B
4. **Rationale for categorization:** The main focus of the article was a SWOT analysis (Strengths, Weaknesses, Opportunities and Threats analysis.) of forest certification on a Runni Organic Farming Expertise Centre. However, the analysis sheds light on the potential economic impacts of certification.
5. **Type of certification:** Forest Stewardship Council (FSC)
6. **Study area:** non-industrial private woodlots in which the Runni Organic Farming Expertise Centre (in Finland) was involved
7. **Study years:** 1997
8. **Method of analysis:** This article examines non-industrial private woodlots in which the Runni Organic Farming Expertise Center was involved. A survey was used to collect quantitative information on forestry operation such as acreage, costs, revenues, etc., as well as demographic information for each operation. These data were used to conduct a SWOT analysis (Strengths, Weaknesses, Opportunities and Threats analysis).

The main focus of the article is the method used to conduct the SWOT analysis.

9. **Findings about impact of certification:** The authors concluded that forest certification could have positive economic impact: Finnish forestry operations could fairly easily adapt to a certification model which would generate positive environmental benefits including increased education of farmers in management practices, increased synergy with agriculture, with relatively little threat to profitability.

Schlyter, P., I. Stjernquist, K. Backstrand. In Press. Not seeing the forest for the trees? The environmental effectiveness of forest certification in Sweden. F*orest Policy and Economics.* Available online 23 January 2009.

2. **Sector:** Timber
3. **Category:** B
4. **Rationale for categorization:** Limited ex post analysis of certification impacts.
5. **Type of certification:** Forest Stewardship Council (FSC) and Programme for Endorsement of Forest Certification (PEFC)
6. **Study area:** Sweden
7. **Study years:** not specified (review of Sweden's history of certification)
8. **Method of analysis:** This article addresses forest certification in Sweden focusing mainly on the adoption trends. However, it includes some discussion of economic implications. However, the authors focus on the impacts witnessed in certified regions only and failed to address the counter factual by addressing regions which did not implement certification standards.
9. **Findings about impact of certification:** n/a

Schwarzbauer, P., E. Rametsteiner. 2001. The impact of SFM-certification on forest product markets in Western Europe: An analysis using a forest sector simulation model. *Forest Policy and Economics* 2(3-4): 241-256.

2. **Sector:** Timber
3. **Category:** B
4. **Rationale for categorization:** This article focuses on socioeconomic impacts of timber certification in Western Europe. However, it only seeks to quantify the potential future impacts of timber certification.
5. **Type of certification:** Sustainable Forest Management (SFM) certification
6. **Study area:** Western Europe
7. **Study years:** 1995 - 2015
8. **Method of analysis:** Using historical economic data related to the European timber industry and general economic and social data, the authors attempt to estimate the impacts certification would have both on the supply and demand for timber in Western Europe. These results were tested against a "business as usual," base case scenario in order to gauge the impacts of certification.
9. **Findings about impact of certification:** The authors find that timber certification would cause a reduced supply of timber products, inducing higher raw material prices and lower profits. Although profits remain positive, timber industry profits fall, particularly those of the saw-mill industry.

Vidal, N., R. Kozak, D. Cohen. 2005. Chain of custody certification: An assessment of the North American solid wood sector. *Forest Policy and Economics* 7(3): 1389-9341.

2. **Sector:** Timber
3. **Category:** B
4. **Rationale for categorization:** This article concerns "chain of custody" timber certification in North America. The authors conducted a survey of certified and noncertified solid wood producers in North America in order to gauge the current status and drivers of chain of custody certification.
5. **Type of certification:** Chain of custody
6. **Study area:** North America
7. **Study years:** 2002
8. **Method of analysis:** 1000 surveys were mailed to certified and noncertified timber producers in North America. The survey inquired about the level of adoption, knowledge and individual market characteristics for each timber producer. Regression analysis was then used in order to explain the drivers of chain of custody certification.
9. **Findings about impact of certification:** There analysis concluded that approximately half of the North American timber producers would be chain of custody certified by 2007. Furthermore, non-certified companies cited perceived lack of economic benefit as a determining factor in the lack of adoption, while certified companies reported no significant economic benefit from certification.

V. TOURISM

CATEGORY A: FOCUS ON IMPACT

Category A1: Accounts for selection bias

Rivera, J. 2002. Assessing a voluntary environmental initiative in the developing world: The Costa Rican Certification for Sustainable Tourism. *Policy Sciences* 35:333–360.

2. **Sector:** Tourism
3. **Category:** A1
4. **Rationale for categorization:** This articles analyze the economic impacts (hotel price per night and sales) of a certification program for Costa Rican hotels. It uses a Heckman procedure to correct for self selection bias.
5. **Type of certification:** Certification for Sustainable Tourism (CST)
6. **Study area:** Costa Rica
7. **Study years:** 1999
8. **Method of analysis:** All 52 certified hotels and 117 randomly chosen, non-certified hotels were surveyed regarding their economic and environmental characteristics. A two-stage Heckman selection model was used to identify the impact of certification on hotel prices per room per night and sales.
9. **Findings about impact of certification:** Their results suggest that participation in the CST program alone does not provide a significant advantage in pricing or sales. Only CST hotels with particularly good environmental performance are able to derive commensurate increase in room pricing. The results suggest that there may be a "free riding" problem, whereby some hotels benefit from others' environmental performance thus reducing the economic value of the certification.

Rivera, J. and de Leon, P. (2004). Is greener whiter? The Sustainable Slopes Program and the voluntary environmental performance of western ski areas. *Policy Studies Journal* 32(3): 417-437.

2. **Sector:** Tourism
3. **Category:** A1
4. **Rationale for categorization:** This paper examines environmental impact of a certification program for ski areas in the western United States. It uses a Heckman procedure to correct for self selection bias.
5. **Type of certification:** Sustainable Slopes Program (SSP)
6. **Study area:** Western United States
7. **Study years:** 2001
8. **Method of analysis:** This paper examines the first year of implementation of the Sustainable Slopes Program (SSP), a voluntary environmental program established by the U.S. National Ski Areas (industry) Association with the endorsement and some financial support from the U.S. Forest Service. It compares the environmental performance of certified and noncertified ski areas located in the western U.S. on the basis of third-party environmental performance ratings. The final sample for the study includes 109 U.S. western ski resorts comprised of 81 participants and 28 randomly selected non-participants. A Heckman selection model is used to correct for self-selection bias. (First, the probability of participation is predicted using a probit model. Inverse mills ratio from the probit model, is used as an independent variable in an ordinary least squares regression that explains environmental performance ratings).

9. **Findings about impact of certification:** Results indicate that participation of western ski areas in the Sustainable Slopes Program is related to institutional pressures in the form of enhanced federal oversight and higher state environmental demands exerted by state agencies, local environmental groups and public opinion. The analysis also suggests that, despite these institutional pressures, participant ski areas is correlated with *lower* third-party environmental performance ratings. This behavior seems to reflect the lack of specific institutional mechanisms to prevent opportunistic behavior by ski areas in the current design of the Sustainable Slopes Program. That is, the program does not involve specific environmental standards, lacks third-party oversight, and does not have sanctions for poor performance.

Rivera, J., P. de Leon and C. Koerber. (2006). Is greener whiter yet? The Sustainable Slopes Program after five years. *Policy Studies Journal*, Vol. 34, No. 2: 195-224.

2. **Sector:** Tourism
3. **Category:** A1
4. **Rationale for categorization:** This paper examines environmental impact of a certification program for ski areas in the western United States. It uses a Heckman procedure to correct for self selection bias.
5. **Type of certification:** Sustainable Slopes Program
6. **Study area:** Western states in the United States
7. **Study years:** 2001
8. **Method of analysis:** This paper is a follow up to Rivera and de Leon (2004). It assesses the first five-years of implementation, of the Sustainable Slopes Program (SSP) from 2001 - 2005. The authors compare participants with a random sample of non-participant ski resorts. They uses a sample of 110 U.S. western ski areas comprised of 79 participants and 31 nonparticipants. They use a Heckman two-stage procedure to correct for sample selection.
9. **Findings about impact of certification:** Result provide no evidence that ski areas adopting the SSP had better environmental performance than nonparticipants for the following areas of environmental protection: overall environmental performance, expansion management, pollution management, and wildlife and habitat management. SSP participants only appear to show a statistically significant correlation with higher natural resource conservation performance rates.

Category A2: Does not account for selection bias

None

CATEGORY B: NOT FOCUSED ON IMPACT BUT RELEVANT

Rivera, J. 2004. Institutional pressures and voluntary environmental behavior in developing countries: evidence from the Costa Rican hotel industry, *Society and Natural Resources* 17: 779–797.

2. **Sector:** Tourism
3. **Category:** B
4. **Rationale for categorization:** This article focuses on the move towards certification within the Costa Rican tourism business. The author evaluates factors associated with participation in the CST and also factors associated with higher environmental performance, but only among participants, not nonparticipants, because environmental performance data was only available for the participant hotels.
5. **Type of certification:** Certification for Sustainable Tourism (CST)
6. **Study area:** Costa Rica
7. **Study years:** 2000
8. **Method of analysis:** Probit analysis was used to assess factors to participation. An OLS regression was used to identify factors associated with higher environmental performance among participants only.
9. **Findings about impacts of certification:** This study concludes that regulatory and industry association pressures are associated with participation and higher environmental performance in the CST. Multi-national corporations do not have significantly higher rates of participation or environmental performance than do local businesses.

Goodman, A. 2000. Implementing sustainability in service operations at Scandic hotels. *Interfaces* 30(3): 202-214.

2. **Sector:** Tourism
3. **Category:** B
4. **Rationale for categorization:** A single case study with no control population.
5. **Type of certification:** Not specific
6. **Study area:** Scandic Hotels in Northern Europe
7. **Study years:** 1990's to present
8. **Method of analysis:** The author provides an analysis of the Scandic Hotel chain, which was on the verge of collapse during the 1990's and after implementing sustainable practices is now a dominant hotel chain in Scandinavia. The authors clearly address issues related to the environmental and economic impacts of eco-labeling, however they only provide a single case study and provide no control group. The authors begin by proving background into the initial conditions that led the hotel chain to implement sustainable management practices and then detail how these practices were put into place and marketed.
9. **Findings about impact of certification:** The authors provide a myriad of examples of how the hotel chain was able to cut it's environmental impact dramatically by implementing sustainable practices at low or negative cost. The authors argue that the main reason these measures were so easy to implement was that the Scandic Hotel chain is one of the largest in Europe and could take advantage of economies to scale and its large clout within the industry. The Scandic Hotel chain soon found that a market existed for sustainably managed hotel services and by promoting itself as an environmentally friendly firm, was able to rapidly transform itself from a failing hotel chain into a profitable and sustainable business.

Tepelus, C. M., R. Castro Cordoba. 2005. Recognition schemes in tourism: From 'eco' to 'sustainability'? *Journal of Cleaner Production* 13(2): 135-140.

2. **Sector:** Tourism
3. **Category:** B
4. **Rationale for categorization:** A single qualitative case study of an entire program.
5. **Type of certification:** Certification for Sustainable Tourism (CST)
6. **Study area:** Costa Rica
7. **Study years:** 2004
8. **Method of analysis:** This article provides an overview of the movement towards ecotourism and provides a specific case study of the tourism industry in Costa Rica. The authors perform an entirely qualitative analysis of the Costa Rican certification program, but they attempt to identify the degree to which the program achieves the goals of sustainability to which it aspires.
9. **Findings about impact of certification:** The authors conclude that the CST program is in many ways, one of the most successful eco-label programs in the developing world. It encourages both continued environmental and economic improvements at the firm level. However, the authors concede that it may be somewhat unique in that, although voluntary, it was established, promoted, and financed by the Costa Rican government. The authors also conclude that there are many ways in which the program effectiveness could be improved, such as giving more consideration to the per tourist waste and instituting individual hotel performance tests.

VI. MISCELLANEOUS

VIa. AGRICULTURAL PRODUCTS

CATEGORY A: FOCUS ON IMPACT

Category A1: Accounts for selection bias using quantitative methods

Becchetti, L, and M. Constantino. 2008. The effects of fair trade on affiliated producers: An impact analysis on Kenyan farmers. *World Development* 36: 823-842.

2. **Sector**: Mango, karkadé, guava, lemon, sorghum, maize, millet, okra, and red pepper
3. **Category:** A1
4. **Rationale for categorization:** The paper controls for selection bias by estimating a system of two equations: a certification (selection) equation and an impacts (treatment) equation.
5. **Type of certification:** Fair Trade (FT)
6. **Study area:** Central Kenya
7. **Study years:** 2005
8. **Method of analysis:** The authors studied 120 producers of agriculture products including 90 with some type of relationship with the FT-certified Meru Herbs Association (MHA) in central Kenya and control group of 30 neighboring farmers. The thee groups with a relationship with MHA were: (i) "bio" comprised of farmers who are certified organic, have a long-term affiliation with MHA, and access to FT export channels; (ii) "conversion" comprised of farmers who have a short-term relationship with MHA and are in the process of obtaining organic certification, and (iii) "only fruit" comprised of farmers who are not affiliated with MHA but sell fruit to it. The fourth group (iv) "control" is comprised of farmers with no commercial relationship with MHA or FT, but who share the same productive environment and advantages of local irrigation infrastructure with affiliates. The members of each of the above four groups were randomly selected from a list of 474 farmers in the irrigation district. In 2005, they were administered a questionnaire that asked about various socioeconomic characteristics.

   To identify the impact of FT certification, the authors first estimate size equations in which they regress a socioeconomic indicator onto a set of treatment dummies identifying the four groups above (bio, conversion, only fruit, control) along a set of farmer characteristics. The six socioeconomic indicators are: (i) self-reported satisfaction with output prices; (ii) weekly household consumption expenditure; (iii) dietary quality; (iv) self-reported satisfaction with living conditions; (v) infant mortality; and (vi) child labor. Recognizing that their treatment dummies are potentially endogenous because of selection effects, the authors also estimate selection effects models for each of the six socioeconomic indicators. Each selection model is comprised of two equations: a certification (selection) equation and a impact (treatment) equation. The former regresses a certification dummy onto farm and farmer characteristics and the latter regress a socioeconomic indicator onto a participation dummy along with a variable that indicates the number of years the producer has been affiliated with MHA. Presumably,

the system is estimated simultaneously using maximum likelihood (details are scarce). A methodological concern is that the authors do not employ an instrument in the first stage certification model (i.e., a variable that helps explain certification but is not correlated with outcomes).

9. **Findings about impact of certification:** The authors find that the number of years of affiliation with MHA variable is positive significant for two of the six selection effects models: nutritional quality and satisfaction with living conditions. They conclude that FT certification has positive causal impacts on these two variables.

Category A2: Does not account for selection bias

None

CATEGORY B: NOT FOCUSED ON IMPACT BUT RELEVANT

None

VIb. BEEF AND PORK

CATEGORY A: FOCUS ON IMPACT

None

CATEGORY B: NOT FOCUSED ON IMPACT BUT RELEVANT

Nilsson, T. and K. Foster. 2004. "Product and process certification in imperfectly competitive markets." AAEA selected paper 118564. Denver Colorado August 2004. http://ageconsearch.umn.edu/bitstream/19933/1/sp04ni02.pdf

2. **Sector:** Pork
3. **Category:** B
4. **Rationale for categorization:** Analysis of certification impacts, but based on simulation.
5. **Type of certification:**
6. **Study area:** USA
7. **Study years:**
8. **Method of analysis:** partial equilibrium model. First, a conceptual model of a certification program in the value chain that encompasses heterogeneity in consumer and producer behavior is built. Second, the authors derive and interpret the optimal decision rules and comparative statics analytically for the general model. Third, the model is parameterized in order to quantify the potential economic impact of a certification program in the U.S. pork sector.
9. **Findings about impact of certification:**

VIc. BIOFUELS

CATEGORY A: FOCUS ON IMPACT

None

CATEGORY B: NOT FOCUSED ON IMPACT BUT RELEVANT

None

VId. CACAO

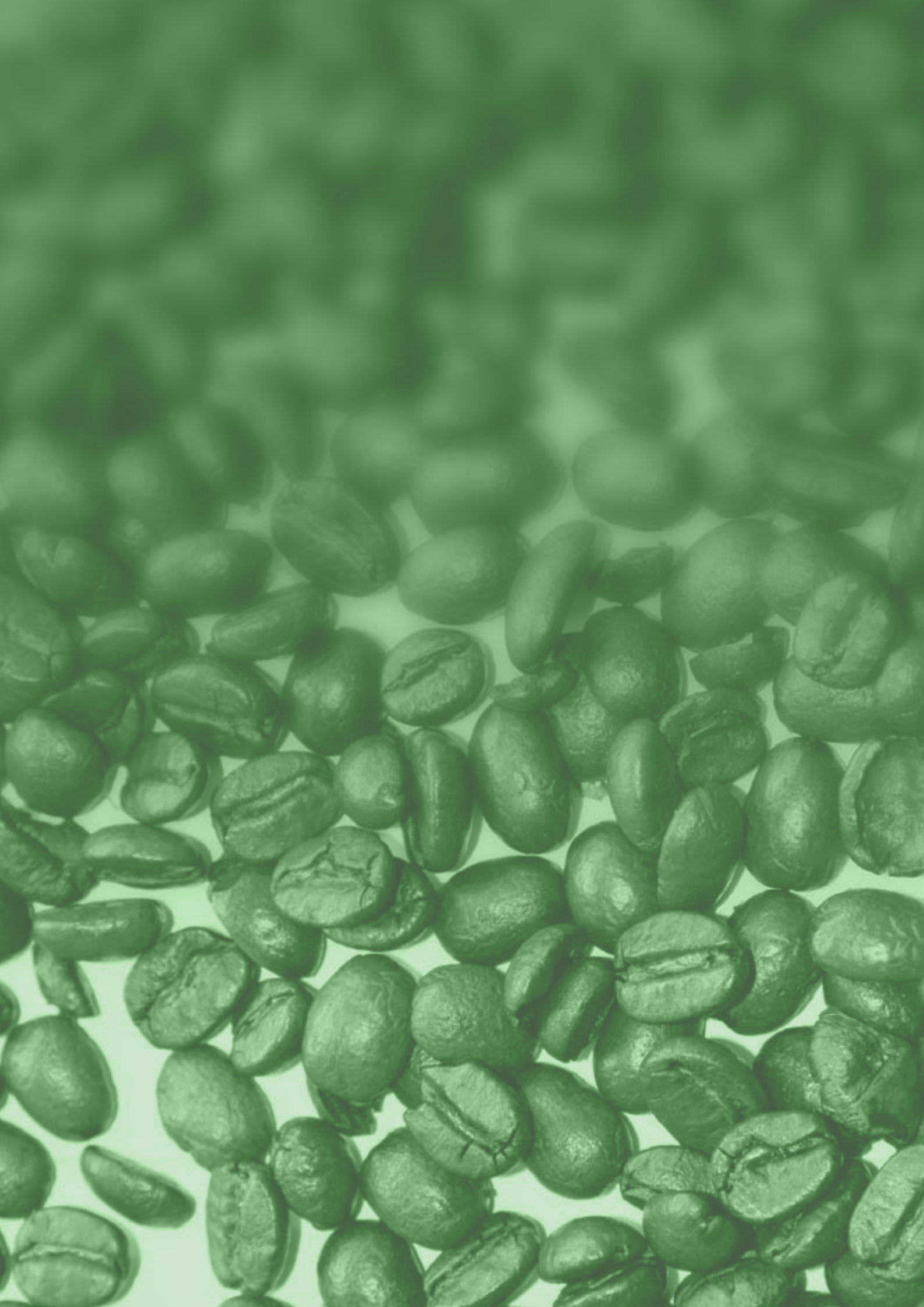
CATEGORY A: FOCUS ON IMPACT

None

CATEGORY B: NOT FOCUSED ON IMPACT BUT RELEVANT

Rotherham, T. "The trade and environmental effects of ecolabels: Assessment and response." United Nations Environment Programme.

2. **Sector:** cocoa, sugar, bananas.
3. **Category:** A2b
4. **Rationale for categorization:** Although the author's goal was to assess the impact of ecolabels, data availability did not allow such analysis. The author then relies on anecdotal evidence and secondary data to draw conclusions on the effectiveness of ecolabeling program in promoting environmental friendly production.
5. **Type of certification:** Blue Angel , Forest Stewardship Council (FSC), the Marine Stewardship Council (MSC), Fair Trade Labeling Organizations International (FLO) and the International Federation of Organic Agriculture Movements (IFOAM).
6. **Study area:** world.
7. **Study years:** not specified.
8. **Method of analysis:** trend analysis of available data on trade flows and price premium of certified products.
9. **Findings about impact of certification:** The author emphasizes that a lack of data makes real evaluation impractical. Based on anecdotal evidence, he concludes that price premia (where they exist) are often not sustained because they decreases with time. Also, "the producer (who bears most of the costs of shifting to more sustainable production techniques) is not the main benefactor of these investments."



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