



# Vietnam Coffee: A COSA Survey of UTZ Certified Farms

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**Title:** Vietnam coffee: A COSA Survey of UTZ Certified Farms

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**Measure and Conversion Notes for the General Reader:**

The Vietnamese dong is the official currency; during the research period it climbed from 17,800 to 19,200 to the US Dollar and averaged 18,780.

The term “target” is used to denote the targeted entities (sometimes called treatments) that were assessed while “control” is used for those entities selected for comparison purposes and to help address the counterfactual questions.

Statistical significance used in the analysis and presentation of findings uses one to three asterisks as follows: \*  $p \leq 0.10$  or at least 90% level of confidence; \*\*  $p \leq 0.05$  or at least 95% level of confidence; \*\*\*  $p \leq 0.01$  or at least 99% level of confidence. These are calculated using t-tests, See Appendix 2 for additional information.

**Counterpart:** UTZ Certified and its Evaluation staff, particularly Tessa Laan and Henk Gilhuis, merit credit for their commitment and effort to commission an independent evaluation of the UTZ work and to also partner actively in the learning that emerged.

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## 1 Executive summary

This 2010-12 assessment project of UTZ Certified farmers in Vietnam was the very first application of the COSA sustainability measurement system in Asia. In 2010, initial field visits were carried out to 351 coffee farms using newly developed COSA tools. This effort served as a vetting process for the approaches and as a field test to establish a basis for further measures of change to determine if there are significant differences between UTZ Certified farmers and similarly matched control groups. Unique features of the Vietnam coffee value chain challenged COSA to evolve these methodological approaches even further, resulting in tools that offer more reliable learning results for UTZ Certified as it pursues its goal to improve futures for farmers.

The study provides evidence that UTZ certified farms have reduced their use of agrochemicals (synthetic fertilizers and biocides) while not significantly sacrificing yields compared to non-certified (control) farms. This is no small accomplishment in a setting with some of the world's most productive coffee farms. Farmers are likely to benefit from reduced costs and the region may benefit from fewer toxic biocides released into the environment and lowered risks of nitrogen leaching. We also know that less use of synthetic nitrogen also means decreased energy use and reduced greenhouse gases.

A key finding in the area of social sustainability was that both certified and control groups had high performance related to protecting basic rights, and maintaining safe work places and strong communities. This meant that certification had little scope to further improve performance. Nonetheless, there were some small, but still notable, indications that UTZ likely strengthened social networks as a significantly greater percentage of the certified sample participated in community infrastructure building, even if the overall number was still modest. Building on these outcomes could help UTZ address some aspects of social sustainability whose outcomes were not positive. Significantly fewer certified farm households had good indoor smoke ventilation - one proxy for family health and the basic quality of housing. In regard to farmers "understanding how the prices they receive are set" – a measure of capacity for self-determination and to improve circumstance – a significantly smaller percentage of certified farmers were aware of this than were control farmers.

Environmentally, in addition to more efficient resource use, the UTZ Certified farms also demonstrated other benefits. A significantly higher percent of certified farmers used water saving measures. Impacts on biocide use were significant with certified farmers using an average of less than one gram of the most toxic Class 1 biocides per hectare, compared to 141 grams on the conventional control farms. The positive environmental indicators, such as recycling and reduced biocide use, likely also reflect some economic savings for producers. Finally, some of the certified farms had modest levels of biodiversity (although sparse) while most of them – and nearly all the control farms - operated coffee monocultures.

The strong and sometimes opaque influence of State Owned Enterprises (SOE) on the farmers (whose certification they hold) presented formidable analytical challenges. The SOE took deductions from the farmers' production for goods and services that are hard to quantify or

compare in any systematic way because they mix together true production costs with costs for social benefits. These deduction costs can include: technical support and training; preferred access to credit; different levels of fees for land use (sharecropping); different levels of input costs; and different levels of social supports such as retirement benefits and medical care. The challenge is that these different types and levels of benefits are neither externally evident nor consistent enough to allow for a clear valuation or comparison.

Certified farmers showed significantly lower cash costs for inputs and that initially misled analysts about the true nature of their net income until these farmers were noted to also have significantly higher deduction costs from the SOE they were affiliated with that were not part of the reporting. The deeper analysis indicated that some costs included in the package of deductions were very likely to be costs for inputs. When accounting for the semi-opaque deductions, the income of certified farmers was not significantly different from that of the control farmers. The data suggests that certified SOE are offering a package of services that may be particularly attractive to poorer farmers. The lack of clarity however also suggests that farmers may not be able to make optimal informed choices.

The discovery of the extent of these cost differences led to the use of expanded qualitative and quantitative research approaches and the application of various analytical models in order to untangle the factors resulting from company policies. This helped to more accurately capture the complex reality that farmers face and to arrive at these further conclusions:

- Certification did not necessarily cause the certified SOE and its farmers to adopt many new practices. Rather, the SOE typically used certification primarily as a way to gain market recognition for desirable practices they already employed.
- SOE representatives said certification's requirements for record keeping and monitoring helped in consistently or systematically applying practices, which may have contributed to the better resource management that was observed in the study.
- The SOE reported that certification has improved prices with a premium range of USD 0.035 to USD 0.05 per kg and added quality premiums of at least USD 0.10 per kg. The amounts they reported passing on to farmers from the certification premiums ranged from USD 0.005 (½ cent) to USD 0.03.
- Analysis of farmer results did not find significant differences between the certified targets and the control groups for either coffee yields or for prices received by farmers; accordingly, there was no statistically significant difference in revenue between the two groups

Overall, the improved resource management of UTZ Certified farmers bodes well for better managing the environmental challenges of coffee farmers striving for the world's highest levels of yields (Vietnam). This is also likely to be a valuable risk management feature when market prices inevitably drop. Certification appears to be having modest but nonetheless significant overall benefits and the data suggests that there are some areas such as transparency and farmer information or awareness that would benefit from further effort.

## 2 About this Document – Purpose, Target, Approach

UTZ Certified seeks to catalyze “better futures” for producers of commodity crops. The UTZ model for achieving this is to apply standards that contribute to more productivity and quality, better environmental conditions, and better social conditions. UTZ maintains a strong commitment to measuring the effectiveness of its programs in achieving agricultural sustainability. As part of this effort, UTZ and Solidaridad (both Netherlands-based non-profits) commissioned the Committee on Sustainability Assessment (COSA) to conduct three independent impact assessments for which they agreed to have no control over any aspects ranging from the selection, to the research methods, to the final analysis. The Vietnam work offered the only opportunity to look at mature certification efforts to see the direction of change after some years of certification, and whether there was indication of improved results over controls, poorer results, or convergence in results.

The objective of this COSA analysis is to measure the impact of the UTZ Certified standard on agricultural sustainability at the coffee farm level in Vietnam. This report presents findings from COSA’s assessment of certification’s impacts using a mixed-methods approach to better capture the diverse conditions found in the field. The main component of the approach was a standardized survey administered to 351 farmers from October through December 2010. This survey collected data on performance related to COSA’s sustainability indicators and was bolstered by several more qualitative methods.

COSA added these qualitative methods in order to enhance the contextual information needed to properly understand the survey results. As part of this effort, an initial stakeholder workshop collected information from a broad spectrum of participants in the coffee value chain in Daklak, the area that was the focus of the survey. An ‘expert consultation’ followed which determined additional steps needed to address the various inputs from stakeholders. Key actions included expanded analytical approaches, and further in-depth interviews of certified companies included in the survey in order to understand the very unique role of Vietnam companies in the coffee value chain.

This report is organized into several distinct sections. The Background section explains the basic and unique qualities of Vietnam’s coffee sector that are relevant to this analysis. The Methods section details the approach COSA used to address the factors and arrive at an assessment. The Findings section is organized according to COSA indicators and compares sustainability results for UTZ certified and conventional coffee farmers. It describes the results from the farmer surveys, as well as any relevant information from the stakeholder workshop, company interviews and farmer focus groups to add context and nuance the findings. The Conclusions section summarizes methodological lessons as well as key points for action from the findings. Finally, the Appendices provide methodological and analytical detail for all the components of the project including the stakeholder workshop, company interviews, and farmer focus groups.

### 3 Background of coffee production in Vietnam

Vietnam is recognized as an economic success story, with one of the fastest growing economies in the world, and the coffee sector has exemplified this growth. The market reforms (doi moi) which followed the nation's sovereign debt default in 1982 are often credited for the rapid expansion. Agriculture is Vietnam's largest employer and plays a critical role in the country's economy, however, it is being replaced by the industrial sector. Agricultural output has shrunk from 25% of gross domestic product (GDP) in 2000 to about 20% in 2010, while the share of industrial output has steadily grown. In 2010 Vietnam's GDP was US\$ 3,100 (PPP) per capita.

Vietnam is one of the world's most important coffee producers. Its meteoric rise to prominence as one of the major high-volume/low-cost producers has had a singular impact on the global coffee industry, as well as in its own rural areas. Coffee was not important as an export commodity in Vietnam until the 1990s. Initially introduced by the French, Arabica varieties were predominately planted, but were later decimated by disease (*Hemileia vastatrix*- coffee rust), and Vietnam switched to Robusta production and a strategy of intensive, high-yield production.

**Figure 1. Map of Daklak research area in Central Highlands of Vietnam**

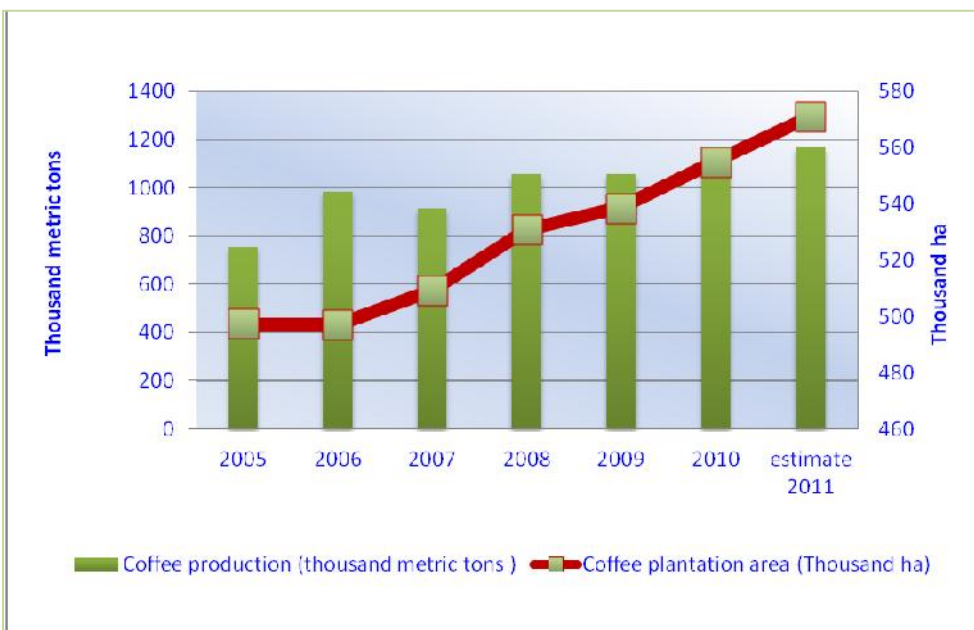


Coffee, particularly Robusta, is concentrated in the Central Highlands region. Between the years 1990 and 2000, Vietnamese farmers in the Central Highlands planted more than a million acres of coffee trees, with annual coffee production expanded from 84,000 tons to 950,000. This startling growth repositioned Vietnam from an insignificant coffee producer to the second largest producer after Brazil.



This economic growth has created some critical problems. Reports have noted that the intensive, often monoculture, production strategy has led to excessive use of water that seriously threatens vital aquifers and a disproportionate application of agrochemicals with resultant contamination effects<sup>1</sup>. Production in the highlands was promoted by the government in the 1970s with land incentives that resulted in social conflicts between the ethnic majority and indigenous and nomadic groups. Vietnamese coffee is known for high-volume production of bulk coffee to be used primarily in the manufacturing of instant coffee. Increasingly, quality is becoming a determinant of price in Vietnam as more sophisticated practices find demand in certain supply channels.

**Figure 2. Vietnam’s share of world coffee production**



Source: General Statistics Office (GSO) and MARD noted in GAIN 2012

Small farmers in the region have an average farm size of 1.2 hectares<sup>2</sup> -- a figure very similar to the farms studied by COSA. The typical farm size is not necessarily indicative of productive capacity because Vietnamese farmers are the most productive in the world. So, even though 85 percent of farms are smaller than 2 hectares, they are world leaders in yields with averages in excess of 2 metric tons green bean equivalent (GBE) per hectare (USDA-GAIN 2010).

**Table 1. Size distribution of coffee farmers in Vietnam (% of total farms)**

>0.2 ha	0.2 –1 ha	1-2 ha	2-3 ha	3-5 ha	>5 ha
3%	50%	32%	10 %	4%	1%

Source: Analysis based on General Statistic Office database

<sup>1</sup> D'haeze, D., Deckers, J., Raes, D., Phong, T. & Chanh, N. 2003. Overirrigation of *Coffea Canephora* in the central highlands of Viet Nam: revisited simulation of soil moisture dynamics in Rhodic Ferrasols. *AgriculturalWater Management*. 63, 185-202.

Ahmad, A.2001. An institutional analysis of changes in land use pattern and water scarcity in Daklak province, Viet Nam. *Institutions, Livelihoods and the Environment change and response in mainland Southeast Asia*. NIAS, Copenhagen.

<sup>2</sup> Thanh, Dang and Gerald Shivley. 2008. Coffee Boom, Coffee Bust and Smallholder Response in Vietnam's Central Highlands. *Review of Development Economics*. Vol 12 Issue 2, 312-326

### **Farmer groups**

The model of a typical farmer-run coffee cooperative is not commonly found in Vietnam. There are some farmer associations and also unofficial teams, groups, and clubs formed by farmers gathering voluntarily. These kinds of groups are established by NGOs or companies to cooperate with factories or enterprises. The unofficial groups have no legal status to execute economic contracts.

### **Coffee collectors**

Exporters, processors and foreign traders are trying to interact more directly with producers and farmers. However, the role of local collectors is still very important in some areas, especially outside the immediate range of the SOE. Coffee produced by farmers is of mixed qualities and collected in bulk for processing in mills. Collectors function purely to funnel volume from individual farmers and provide transport to mills, getting a small price margin for their efforts.

### **Exporters & traders**

Export activities are presently handled by coffee companies that have processing facilities. Small-scale farmers and coffee collectors do not have any role in exporting. All of the biggest coffee traders in the world are operating in Vietnam and operate with local enterprises. The biggest names are: Vinacafe (Buon Ma Thuot), Thai Hoa Coffee Company, Neumann, Armajaro, Parcolini, Olam, Dakman (Volcafe), Acom (Ecom), Simexco, Intimex.

### **State-Owned Enterprises (SOE)**

SOE play a considerable role in the region, controlling large areas of prime land that are leased to farmers who pay a sharecropping quota of their production. Some SOE provide a number of social benefits to their member farmers such as health insurance and retirement support. They are also a valuable source of technical assistance, low-cost inputs, irrigation, and can even facilitate credit. Technical assistance can extend beyond advising to asserting required protocols that farmers must follow. SOE typically can provide processing and marketing, but a number of farmers affiliated to SOE sell their own portion of the crop to private buyers. The organizational structures of SOE have made them a natural vehicle for applying certifications and indeed they were among the first to do so.

## 4 Methods

### Impact Evaluation: approaches used

Research in impact evaluation has established a preferred hierarchy of empirical approaches valued for the degree to which decision makers can rely on the results to be an accurate representation of actual effects. Attempts to quantify impacts are restricted by the available data, time and resources necessary to have optimal results. Many case study approaches that estimate a simple account before and after an intervention, or compare a group that received an intervention with a group that did not, suffer from flaws. These case studies are unable to accurately account for both observable and unobservable differences between the groups or changes in the environmental, social, or economic situation that are unrelated to the project. Purely experimental approaches (such as randomized control trials) attempt to control for some of the challenges to good data by randomly assigning entities to the study. However, when such field experiments are not possible due to constraints of time or situations that make them less preferable from a social or economic perspective, quasi-experimental approaches are often used to estimate the impact of particular interventions. The analytic choices include Propensity Score Matching (PSM) and Instrumental Variable (IV) analysis, and these were the methods selected by COSA and applied to this work.

The choice of approaches depends partly upon the assumptions that are applicable to the population being analyzed, the possibilities and limitations of specific interventions or projects (including the intervention history), as well as locally available data for *a priori* matching of target (treatment) and control groups. As with all quantitative approaches, both require a hypothesis about the appropriate theory of change that is tested by comparing the groups that have had the intervention or treatment (target) with groups that have not (control). The control group functions to address the counterfactual – an estimator of what the condition of the target group would be if it had not experienced the intervention. After controlling for observable differences, this allows some reasonable attribution or at least correlation of differences in performance to the treatment, that is, in this case, UTZ certification.

PSM attempts to approximately simulate randomized trials by selecting target and control observations from populations judged to be similar for factors that would affect performance on tested indicators. It then matches individual observations – in these cases farmers - according to variables that might affect performance. The challenges to PSM are: 1) self-selection bias wherein farmers choosing certification may be intrinsically different from farmers that do not; 2) finding uncertified groups that are similar to the certified groups may be difficult; and 3) some unobserved differences that do affect performance can emerge in groups that initially appeared to be similar. In situations where there are many unobservables that could impact the outcomes or where available control groups do not closely match the target groups, then IV can be more robust as it allows some control for these unobservables without completely relying on a matched control group. See Appendix 1 for more in depth information.

Both PSM and IV can be combined with Difference in Difference analyses which measures performance for both target and controls before an intervention begins and then after the intervention is introduced. Coupling the current data and analysis with follow-up rounds of data collection provides a robust assessment of the effects of UTZ certification on the coffee farmers in Daklak. This avoids a serious drawback of before/after approaches, especially to the extent that annual variability in conditions (independent of those caused by the intervention) may drive many of the observed changes. This is especially the case for agriculture, where, for example,

the certified SOE in our sample indicated they had been unable to calculate the difference in sustainability factors before and after certification because a number of variables (such as price, credit, and weather) varied substantially from year to year. When, as in this case, there is no baseline year for a Difference in Difference analysis, then Single Difference Analysis can be applied successfully (see, e.g., Bernard et al. 2008).

### **Approach for UTZ Certified in Vietnam**

COSA's indicators reflect a robust and inclusive theory of change that covers the three pillars of sustainability: economic, social and environmental. These indicators derive from a broad participatory process, considerable field testing, and benchmarking to dozens of international conventions and normative agreements such as those administered by UN bodies or multilateral agencies (e.g. International Labour Organization Core 8 Conventions, International Covenant on Economic, Social and Cultural Rights, Convention on Biological Diversity, OECD Economic Guidelines, etc.).

In brief, COSA used scientific inquiries to gather and then compare the results of the UTZ Certified group with a control group selected to be as similar as possible in all observable and likely non-observable respects that affect sustainability performance – except that the control group is NOT certified. The uncertified control group provided an estimate of the counterfactual or how the similar certified farmers would have performed had they not been certified. The differences in performance between the groups can then most likely be attributed to certification.

#### **Box 1. UTZ certification objectives & local compliance**

UTZ certification incorporates standards for sustainable agriculture, meant to provide better income and economic results, better environment, and better social conditions. UTZ certification achieves change by training farmers to implement standards that are designed to improve farm practices.

It claims to implement credible control systems to ensure farmers follow standards. Evidencing this, all of the interviewed participating SOE companies responded similarly to the question of what they found most important for achieving UTZ certification stating, "to get UTZ Certified, we must comply with all the criteria of UTZ."

### **Sample selection**

The Daklak region was selected for a variety of reasons. It covers 50 percent of UTZ Certified farmers in Vietnam and is Vietnam's main coffee growing region. It therefore likely offers the best representation of both UTZ Certified farmers and of Vietnamese coffee farmers as a whole. This choice also provided a chance to look at the effects of a mature certification process and may represent a baseline opportunity for further impact analysis in the future. Since most UTZ farms in Daklak were certified in 2006 or 2009, a before/after comparison was not possible so we relied upon a robust with/without analysis. Of course, regardless of the method selected, there is no way to guarantee that all related effects, particularly smaller or more ephemeral ones, will always be captured. UTZ provided an overall list of all the groups they have certified since 2004 for our sample selection. The list consisted of 23 companies in 5 districts encompassing nearly 20,000 farmers, as shown in Table 2 below.

**Table 2. Total UTZ Certified coffee farmers in Vietnam in 2010**

District	Companies (SOE)	Farmers	Percent of all UTZ farmers
Don vi tai Lam Dong	4	6,392	32
Don vi taji Gia Lai	4	3,243	16
Don vi tai Quang tri	1	220	1
Don vi tai Daklak	13	9,944	50
Don vi tai Daknong	1	196	1
Total	23	19,995	100

Since State-Owned Enterprises (SOE) are dominant actors in Daklak, we semi-randomly selected UTZ Certified SOE to get a representative sample of UTZ certification there. This process consisted of an initial partially-random selection of SOE in order to obtain a representative mix of small, medium and large SOE. The Western Highlands Agroforestry Scientific and Technical Institute (WASI), COSA's implementing partner in Vietnam, then selected control SOE that matched the certified SOE on the factors which would most affect farm performance. Among others, WASI considered geography-topography, climate, soil type and prevalence of coffee in the region as matching criteria. The sample included a mix of SOE that lease land to small farmers in exchange for a share of the produce, as well as SOE that buy from small farmers who own their land.

After selecting the SOE and obtaining lists of the villages associated with each one, we then followed a similar process for randomly selecting villages that work with the SOE. WASI then recommended matching villages from control SOE. In general, we used the first set of villages selected through random number generation, and only skipped villages that had extremely small numbers of certified farms.

Finally, COSA randomly selected farmers from both the target and control villages using lists of village coffee farmers. The total sample size was 351 farms, allowing for a high-level of quality control and for subsequent, reliable econometric analysis. We allocated 169 farms to the UTZ target (certified) group and 182 farms to the control (non-certified) group. Table 3 shows the sample target SOE and villages, the matching control entities and the numbers of farmers selected from each village. Field data collection by experienced WASI surveyors initially occurred from October 2010 through January 2011.

**Table 3. Sample design**

Certified companies	Villages	Sample size	Control companies	Villages	Sample size
<b>Companies (without land)</b>					
<b>September 2 Company</b>			<b>Producer Association</b>		
	Thon 1 Btrap (Buon trap)	9		Bang Adrenh	9
	Thon 2 Cuebua	4		Hoa Thuan	5
	Thanh cao.etan	7		Tam Giang	9

State Farms					
<b>Drao</b>			<b>Viet Thang Company</b>		
	Thon 1	7		Thon 3-EaTieu	6
	Thon 3	6		Thon 6-EaTieu	8
				Thon 7-EaTieu	2
<b>Eapok</b>			<b>Viet Duc Company</b>		
	Eamoc	23		Thon 7-Eaktur	7
	Lang	25		Thon 8-Eaktur	13
	Bihn	27		Thon 13-Eatieu	26
				Thon 6	33
<b>Phouc An Company</b>			<b>721 Company</b>		
	Phouc An	30		Eakmut	33
	An Thuaan	31		CuNi	31
<b>Total Farms</b>		169		<b>Total Farms</b>	182

## Analysis

The Vietnam assessment used a mix of qualitative and quantitative methods to generate an understanding of some of the important potential impacts of UTZ certification on the sustainability of coffee production in Daklak. Initially, we classified and then analyzed the data using a PSM approach. With support and encouragement from UTZ Certified, we conducted a stakeholder workshop in Daklak to review the results. The workshop brought together many of the key actors in the coffee value chain in Daklak, including representatives from SOE, traders, Agriculture Ministry, research organizations, farmers, regional development organizations and UTZ Certified staff. The goals of the workshop were to:

1. Share the approach and findings of the COSA study with local stakeholders
2. Validate the findings of the COSA study
3. Collect expert feedback that helps to interpret or question findings
4. Collect expert feedback that helps to better understand influencing factors and attribution
5. Collect qualitative information about other positive/negative and intended/unintended effects of the program
6. Receive stakeholder suggestions for overall learning & improvement

The workshop and an expert advisory team concurred that the analysis needed to better account for the opaque and very diverse SOE policies since these appeared to have substantial effects. The influences of these SOE were not easily quantifiable or even, in some cases, discernible due to the mixed packages of benefits offered to producers. This was likely the most challenging aspect of the analysis because it required both determining the nature of the SOE effects and finding controls with very similar conditions. Table 4 of the SOE characteristics and policies illustrates the difficulty in finding control SOE similar to certified ones. One can observe contrasts such as the percent of farmers' crops deducted (25% to 88% for those that own land) while the range for the control SOE is much lower (24% to 29%). Similarly, the percent of women farmers with the target SOE is 10 to 73 percent while the range among the 4 control

groups is 0 to 15 percent. With these differences in the farms that constitute the control versus the target SOE, it is not surprising that a limited number of target farms would match the control farms in these parameters.

**Table 4. SOE Policies and demographics**

SOE	Price premium paid to farmers	%SOE deducts if farmer production is 10T	% women farmers	% minority group farmers	Benefits SOE provides and deduction structure
<b>Certified SOE</b>					
Co 1	.03	0	10	21	SOE provides only technical advice and training to farmers (as well as coffee marketing). Thus, there are no deductions to the farmer.
Co 2	small	71	52	53	SOE provides land, fertilizer and irrigation (SOE has banned biocides). Farmers must pay fixed amount of coffee; if farmer's production falls short, the farmer owes the shortfall the next year.
Co 3	.005	60	73	55	SOE provides land, management and deducts an amount of coffee under both of the following. With Plan 1 SOE provides physical inputs and keeps all the coffee, but pays farmer the value of 40% of the coffee produced. With Plan 2, the farmer buys fertilizer, pesticides and water with advice of company. Farmer then keeps 40% of coffee produced to sell at any time.
Co 4	.03	25 or 88*	29	10	SOE supplies land and management. If SOE supplies irrigation water, fertilizers and pesticides, the farmer must give the SOE 8T cherry. If farmer supplies them, the farmer gives 2.5T cherry. * depending on the subdivision of the SOE
<b>Control SOE</b>					
Co 5	NA	0	15	10	SOE has no land and does not have a deduction for management or irrigation. It supplies low-interest loans for inputs, training and some technical advising.
Co 6	NA	24	0	29	SOE provides land and management for a fixed amount of farmer's production. SOE advises farmers on application of irrigation water, fertilizers and pesticides. Farmers can purchase these from the SOE by cash or coffee.
Co 7	NA	29	8	42	SOE provides land, management and water for a fixed amount of the farmers' coffee. Fertilizers and biocides are a credit arrangement between the SOE and the farmer to be paid back in coffee.
Co 8	NA	29	7	49	SOE provides land, management and water. SOE also 'lends' fertilizers and biocides for fixed amount of coffee.

The very notable differences between the target and control farms in important factors such as the differences that exist between diverse SOE policies meant that PSM, the method used in the original analysis, would not be the optimal choice. This method assumes that there are no differences in unobservable characteristics (such as, in this case, the SOE policies). The project analysts then concurred that for this situation - where the target and control SOE were different in factors that would affect performance on indicators - that Instrumental Variable (IV) Analysis offered a more appropriate tool for this part of the analysis. This approach consists in finding a set of variables or ‘instruments’ that are highly correlated with participation in certification, but do not affect outcomes directly. Those variables are then used to more robustly estimate the impacts of certification.

The Key Findings section below represents the results of the analyses. All relevant statistical tests confirm that it is a suitable approach for use with the data. In addition to the IV analysis, multiple levels of qualitative data as shown in the ‘component’ column in Table 5a are used to complement the findings and provide information that strengthens the overall analysis. This mixed-methods approach, relying upon both qualitative and quantitative information collected with local experts, provides a good picture of the impacts of UTZ certification in Daklak, as Table 5a shows.

**Table 5a. Assessing the Components of Research Methods**

Component	Strengths	Weaknesses
Farm-Level Survey  Conducted October – December 2010 with 351 farmers	<ul style="list-style-type: none"> <li>• Field-collected data that was thoroughly checked</li> <li>• With/without sample design allows some differences to be seen</li> <li>• Samples are representative of the local range</li> </ul>	<ul style="list-style-type: none"> <li>• Non-randomized targets</li> <li>• Impossible to control for all possible non-project differences</li> <li>• Samples may not represent other UTZ Certified farms in different regions or production structures</li> </ul>
Stakeholder workshop March 2012 (See Appendix 4)	<ul style="list-style-type: none"> <li>• Allowed a cross-check of household survey</li> <li>• High interest in providing good information for the analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Aggregated information (non-household level)</li> <li>• Can be biased if used as only dataset</li> </ul>
Farmer focus groups March 2012 2 focus groups with farmers – 1 associated with a certified SOE and 1 with non-certified (See Appendix 6)	<ul style="list-style-type: none"> <li>• Allows consideration of historical context</li> <li>• Deeper background of sustainability concerns of the farmers</li> </ul>	<ul style="list-style-type: none"> <li>• Small groups surveyed may not be fully representative</li> </ul>
Company In-depth interviews Dec. 2012 with all certified SOE in the sample (Appdx 5)	<ul style="list-style-type: none"> <li>• Allows consideration of unique role of companies in Vietnam coffee sector</li> </ul>	<ul style="list-style-type: none"> <li>• Access limited to select respondents at the company level</li> </ul>



Table 5b below outlines the major concerns for valid research in this case and the mitigations adopted to address the concerns.

**Table 5b. Mitigation of validity concerns**

Validity Concern	Addressed through	Ongoing Caveats
Self-Selection	<ul style="list-style-type: none"> <li>• Including controls for possible differences</li> <li>• Farmer-focus groups used to validate field data</li> </ul>	<ul style="list-style-type: none"> <li>• Impossible to control for all possible non-project differences</li> </ul>
Differentiated company policies	<ul style="list-style-type: none"> <li>• In-depth surveys with company managers</li> <li>• Changed analytical approach from PSM to IV approach</li> </ul>	<ul style="list-style-type: none"> <li>• All information may not be made available</li> </ul>
Consideration of correct context	<ul style="list-style-type: none"> <li>• Conducted farmer focus groups</li> <li>• Surveyed firms</li> <li>• Consulted expert group</li> </ul>	<ul style="list-style-type: none"> <li>• Selective memory and self-interest can continue to play a role</li> </ul>

## 5 Key Findings

### Core demographic and farm characteristics

The demographic characteristics for the both the target and control farms were largely equivalent. The average size of target farms was 1.36 hectares as compared with 1.15 hectares for the control group. The average household size is 4.2 and 4.3 persons for target farms and control farms respectively. Target farms display a younger, slightly less educated workforce though the differences are relatively minor. As Tables 6 through 8 show, both the target and control groups are similar demographically. This indicates a good baseline for comparative analysis. However, as described in the Analysis section above, other factors, especially the policies of the SOE that were sampled, also had to be accounted for.

**Table 6. Household characteristics of sample farms**

HOUSEHOLD CHARACTERISTICS		
	Target	Control Group
Household Size	4.2	4.3
Percentage of household members who are male	53%	54%
Average farmer age	42	47
Average farmer education (years)	7	9
Average farmer experience (years)	21	18

**Table 7. Land tenure and management characteristics**

LAND TENURE AND MANAGEMENT		
Percentage of producers who...	Target	Control Group
Own land	12%	12%
Farm on land owned by others without paying anything	0%	1%
Pay to rent land	0%	0%
Exchange produce for rights to all land farmed (sharecropping)	88%	87%
A farm owner/renter/sharecropper manages the farm	92%	90%
A farm owner pays a manager to operate the farm	6%	4%

**Table 8. Farm size characteristics**

FARM SIZE		
	Target	Control Group
Average farm size (hectares)	1.36	1.15
Average coffee plot size (hectares)	0.96	0.86

Table 4 above on SOE characteristics shows that certified companies have higher proportions of women and minority members than control companies, both groups that have historically been disadvantaged. Although current data does not allow firm conclusions, UTZ may want to investigate further if certification has helped companies with farmers facing more difficult situations to gain some advantages.

Like the vast majority of coffee farmers in Vietnam, all the farmers in both the target and control groups produced robusta coffee. There were some variations in the form of coffee produced by the two sample groups to ascertain if they led to different results. All farms in the control group produced and processed coffee to the green bean stage. In the target sample, farmers of two SOE produced green bean coffee and the farmers from the other two SOE produced fresh cherry coffee for their SOE, but processed green beans for the coffee they retained to sell on their own. There is no evidence that producers of fresh cherry coffee (87% of target farms) may be at a disadvantage since price structures in the region are designed to equivalently compensate fresh cherry and green bean coffee given the weight and processing difference.

**Box 2. Training as a channel for change**

The effectiveness of training is a key element of the UTZ theory of change toward greater sustainability. It is a primary channel that transforms standards into actions. Establishing correlation and even attribution between an intervention and an outcome is stronger when such a channel for achieving change is apparent, defined, and can be well-measured.

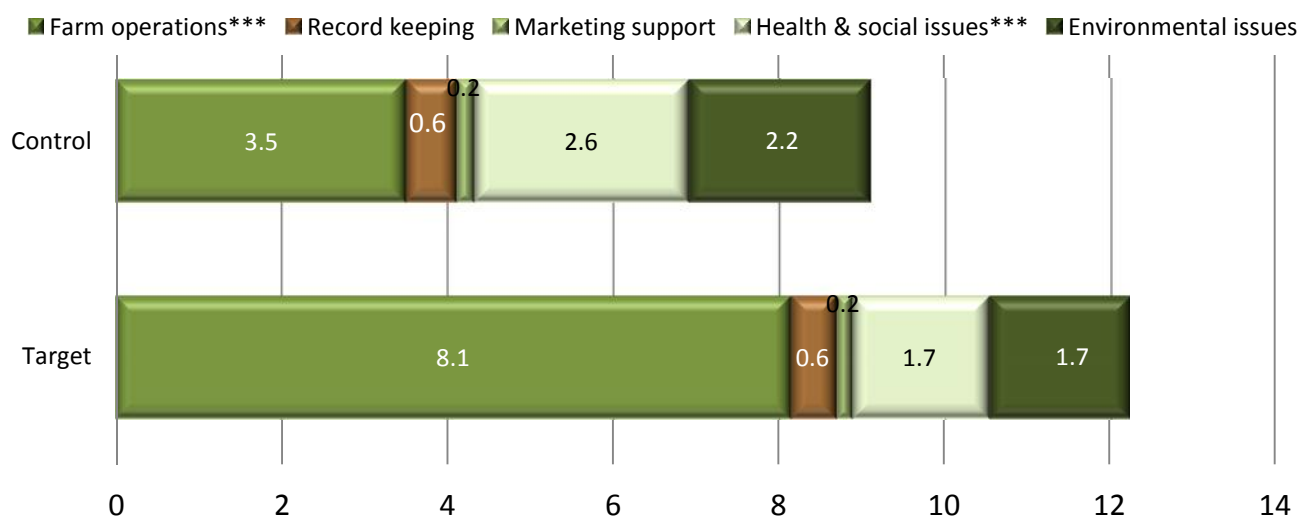
**Training**

Farmers in the UTZ group reported averaged 12.2 hours of training compared to 8.8 hours for control farms, a significant difference, as Figure 3 shows. This result demonstrates a channel for change, but also is an indicator of certified companies investing more in farmers’ human capital - an important element of capacity building and empowerment.

In certified company interviews, all representatives said they conducted farmer trainings, particularly on farming practices, before certification. However three companies mentioned that since certification, training became more consistent and more practical. Focus group farmers had a different view. The certified farmers said companies used to provide most training, but that now agrochemical suppliers offered much training. Both certified and non-certified farms noted that suppliers urged them to use more fertilizer than they themselves believed was needed.

The increased and more targeted training with more focused attention on good protocols may have helped farmers rationalize their rates of chemical input usage. While there is little evidence about the actual quality of the training, it is fairly clear that certified farmers managed to get similar yield levels with fewer inputs than their uncertified counterparts, suggesting a very useful outcome.

**Figure 3. Average hours training in last production year\*\***



\*\* Overall training is significant to 95% confidence level - levels vary for specific training categories.<sup>3</sup>

## Economic Sustainability

Results from the Daklak study showed that UTZ certification likely had significant impacts on reducing farmers' inputs costs, primarily because of reduced costs for agrochemicals. We did not find that the significantly less money that farmers spent on such inputs led to significantly different yields or revenue. This suggests that the farmers with UTZ certification may have increased their input use efficiencies. However, a substantial and confounding factor exists in the observed production areas: the influence of company policies among the firms that organize the farmers and market their coffee. Such firms, often former or current SOE, provide different types and levels of support that are sometimes explicit and sometimes implicit or at least not externally evident or consistent enough to allow for a like-to-like comparison. Accordingly, when company deductions for inputs were taken into account, the actual net income did not appear to be significantly different between UTZ Certified farmers and the uncertified control farmers.

<sup>3</sup> Statistical Significance in the paper is expressed as:

\*  $p \leq 0.10$  or at least 90% level of confidence

\*\*  $p \leq 0.05$  or at least 95% level of confidence

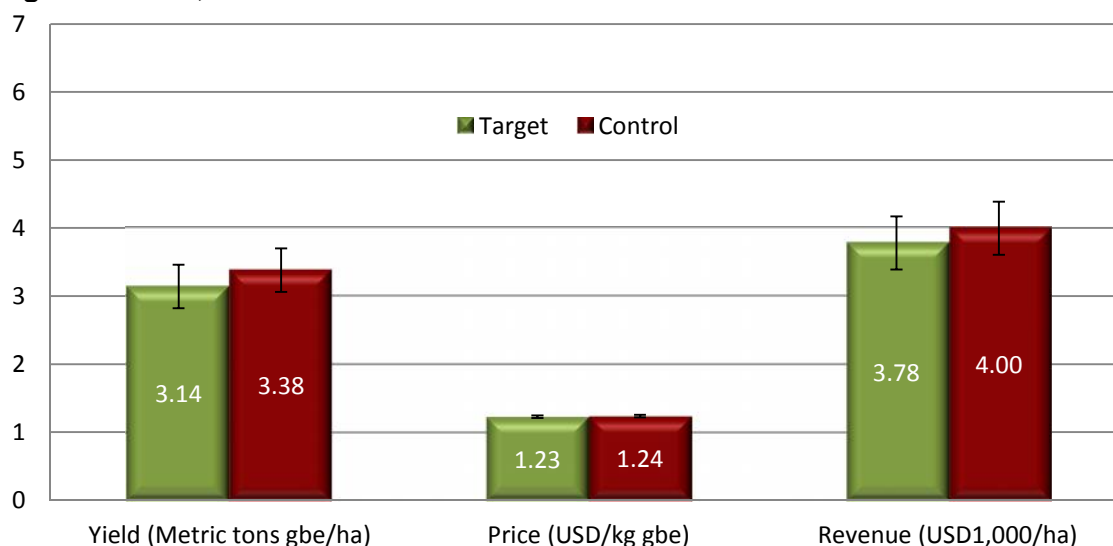
\*\*\*  $p \leq 0.01$  or at least 99% level of confidence

## Yield, Price, Revenue and Income

The picture is straightforward on overall revenue. We found no significant differences between target and control groups in coffee yields or in prices to farmers. Unsurprisingly, then, neither was there a statistically significant difference in revenue between the two groups.<sup>4</sup>

For small holder farmers in many countries, productivity increase is often a major element of better livelihoods. However, as noted in earlier sections, Vietnam already has some of the highest coffee production levels in the world. In our sample, yields topped 3,000 Kgs (Gbe) in average production. Given this very high yield, it is not surprising that further gains could not reasonably be achieved. Company interviews support this. All the certified companies noted that they already had their own agronomists, employed best practices, and did not make major changes in production practices following UTZ certification. The SOE reported, however, that UTZ certification resulted in better monitoring (management) of farmer practices. This is consistent with the finding that UTZ Certified farms achieve yields not significantly different from control farms, but with lower inputs (increased efficiency).

**Figure 4. Yield, Price and Revenue**



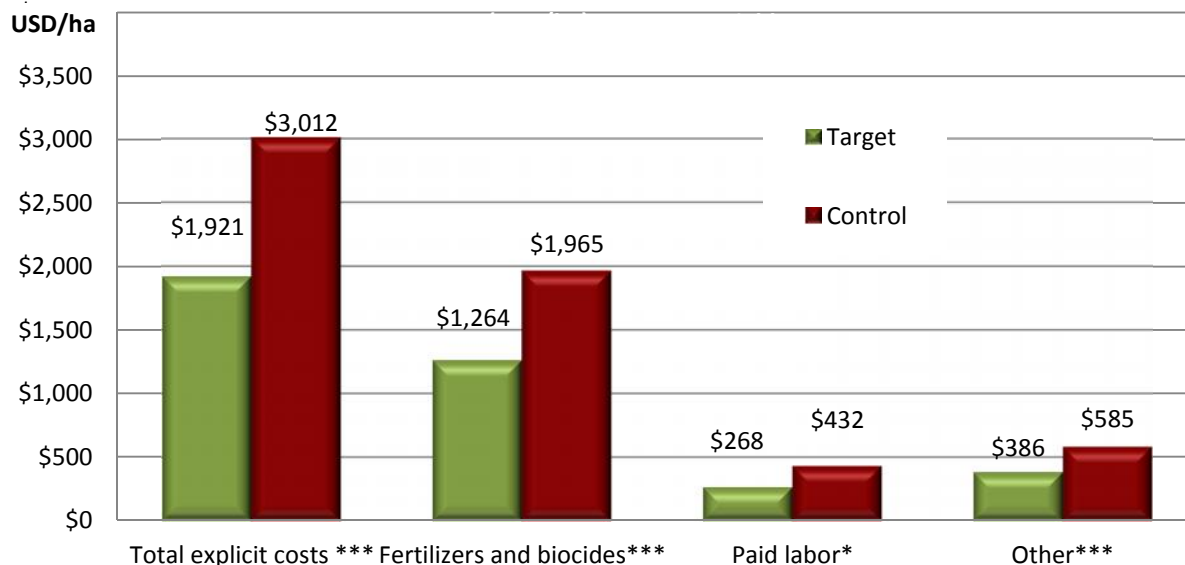
## Costs

The cost side is more complex. Certified farmers show significantly lower production costs when only explicit inputs are accounted for (fertilizer, biocides, paid labor, processing costs, annual depreciation of production assets, and reforestation costs). While the target farmers showed statistically significant differences that were lower than the controls for all these explicit cost

<sup>4</sup> As is common with smallholders, the farmers in our sample displayed great variation in production, costs and thus income. Thus, the estimated means presented in this report offer the degree of confidence that there is a difference between target and control groups within the entire population of UTZ farmers compared to a control population of similar farmers and the direction of the difference – that is – whether the target or control groups have higher values. Note that the areas defined by the lines at the top of each of the bars for yield, price and revenue overlap. While the height of the bars show the mean results for our sample, the lines define the range we expect that the true mean for the population would fall into, given the variability of the sample. When the area of overlap is substantial, there is lower statistical confidence – or likelihood - that the means for the entire population of Utz certified farms in Daklak is different than the means of the population of control farms there. For yield, price and revenue, the difference in means between the sample groups is as likely to be due to random chance as to actual difference in the populations so no difference can be reasonably attributed.

categories, the major component driving the difference was physical inputs (fertilizers and biocides). These accounted for more than 60 percent of total costs for target and control respectively.

**Figure 5. Basic Explicit Costs (USD/ha)**

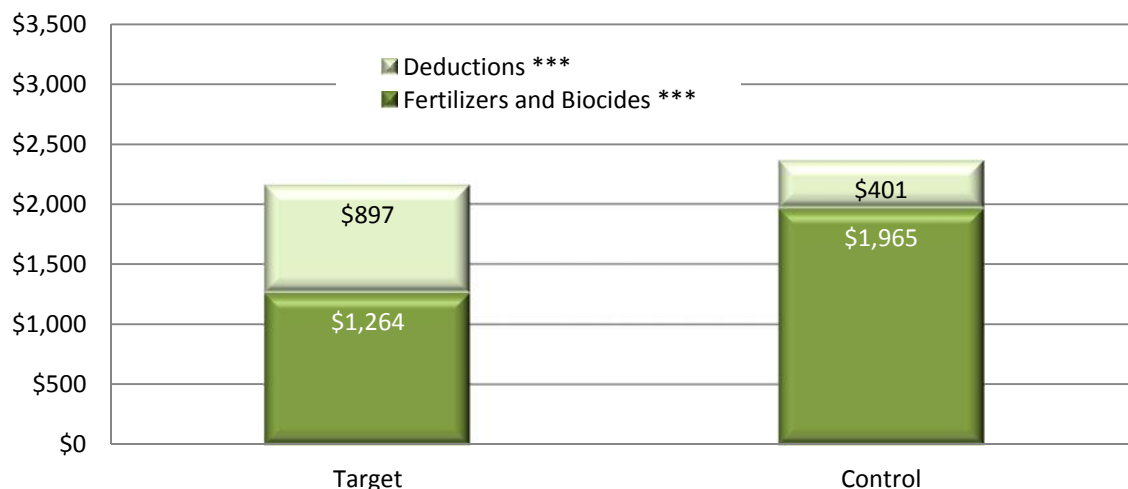


However, most of the target and control farmers in our sample also incurred a related “deduction cost” from the SOE they partner with. These SOE have various forms of share-cropping arrangements where farmers use the land to produce coffee in exchange for providing a portion of their proceeds (a deduction) to the SOE that controls the land. This is usually in the form of a specified amount or a percentage of the coffee they produce. These deductions and the company policies about applying them to their member farmers were a key focal area for the follow-up investigations with the diverse SOE.

The data and SOE interviews confirm that the deductions often included costs for production items such as fertilizers. For target farms, which have high average deductions, the explicit farmer input costs are low. For control farms, which have low average deductions, the costs of inputs are high, as Figure 6 shows. While these differences are highly significant for the two individual components, when the combined costs of deductions and inputs are compared, the difference is small and not significant. Of course, components of the SOE deduction such as fertilizers and biocides should be treated as legitimate costs of production. However, farmers typically did not report this portion of the SOE deductions under these categories. This is understandable since the ways these costs are calculated and charged differ and are often opaque. For example, while all SOE provide technical advice about inputs, input costs differ and, in some cases, the SOE require farmers to use established amounts, while in other cases, farmers decide how much to use. Some SOE want repayment in coffee equivalent to the value of the inputs, while in other cases farmers using SOE inputs must repay a set fixed amount of coffee, irrespective of its value. Complicating matters further, these SOE sometimes provide other inputs or services such as irrigation under varying arrangements. Finally, the SOE that lease land have separate deductions that can cover management fees for technical advisory, training and other services such as marketing.

These true production costs are lumped in with SOE charges for different levels of social supports such as retirement, schooling and medical insurance and possible preferred access to credit. The resulting lack of clarity makes it very difficult to identify what costs are production costs and what are other benefits.

**Figure 6. Comparison of Input and Deduction Costs (USD/ha)**



N.B.: the difference between the total of input and deduction cost is not significant.

The ambiguity surrounding deductions makes the income picture complex. This complexity arises because ascertaining actual net income critically depends on being able to isolate true production costs from social benefit costs, which as explained above is problematic. Given the information about SOE policy that we could obtain within the scope of our survey, it is highly likely that not reflecting deductions understates true production cost and so overstates income. On the other hand, income reflecting deductions may overstate production costs (because of the social benefits costs included) and thus understates net income. When the deduction costs are not accounted for, net income is higher for the target group at USD1,862 compared to USD1,042 for the control. When deductions are accounted for, the target income of USD964 compares to USD536 for the control, but there is no significance in the differences with a confidence level of only 71%. The survey data does show – and both SOE interviews and farmer focus groups corroborate – that lower costs for inputs among certified farmers reflect actual lower usage (see more discussion in the Environmental Sustainability section below).

As the notes to Table 4 show, while the control SOE in general have a straightforward structure that deducts for inputs in direct relation to the cost of the inputs the farmer obtains, the target SOE do not have such a direct relationship, often relying on a flat amount of coffee deducted. This means that it is likely difficult for farmers to be able to relate their deductions to true production costs and ultimately to be able to actually ascertain their production costs during the season.

In summary, it is extremely difficult to be certain about cost differences. Given the way different costs and benefits are lumped together, one would have to calculate the net present value of a combination of nebulous retirement benefits, social provisions, and pre-arranged fertilizer deliveries that are offered in different combinations, and then compare those to the value for

another farmer of more income-in-hand and perhaps discounted fertilizer costs, to know for sure.

The analytical efforts to take into account the SOE policies help establish a framework for untangling these factors. Such initial work could contribute to understanding how poor smallholders evaluate the complex packages of benefits offered by the SOE and how certification fits into their decisions as they seek improved livelihoods.

The data suggest other aspects of economic impacts on farmers that UTZ may want to know more about. One potential conclusion that emerged from the qualitative approaches is that SOE may sometimes keep more of the price premiums for certified coffee than they pass on to farmers. The certified companies reported receiving premiums for certification that ranged from USD 0.035 to 0.05 per kg with added quality premiums of at least USD 0.10 per kg. Amounts these companies reported passing on to farmers from the certification premiums ranged from ½ cent (USD 0.005) to 3 cents (USD 0.03). However, the analysis of price data from our survey using Instrumental Variables (IV) to control for differences in sample characteristics, including company policy, found certified farmers did not receive significantly higher prices than control farmers.

One company said this was because the farmers did not do anything substantively different with UTZ than without. The companies expressed that work practices had not necessarily changed significantly, except for record keeping and some environmental practices. All the certified companies reported incurring some extra management costs for certification. With the certified label, they noted, the market rewarded these practices.

Another aspect is the possibility that SOE that allow farmers more discretion over their farming choices may be more favorably viewed by farmers. As the table shows, the certified SOE with the most open policies has grown substantially in the last few years, while other SOE have stayed the same or declined in size. This, of course, is not proof of producers’ better receptivity and is certainly not a strong or definitive finding.<sup>5</sup>

**Table 9. SOE trends in farmer membership and premiums paid for certification**

Company	Farmer membership trends	Premiums for certification and/or superior quality
Co 1	2009 = 951 members 2012 = 2470 members	.03
Co 2	2006 = 540 members 2012 = 348 members	None noted
Co 3	2004 = 744 members 2012 = 500 members	.005
Co 4	Early 2000= Unknown but shrinking coffee area may reduce farmers 2012 – 1,400 members	.03

Farmers in the certified focus group expressed some dissatisfaction with prices they received, with their land tenure and with the yields they obtained. According to information from their

<sup>5</sup> Some of the reason that other SOE have declined, we discovered, is that they have had to retire aged trees from production and are awaiting a government ok to replace them or repurpose the land.

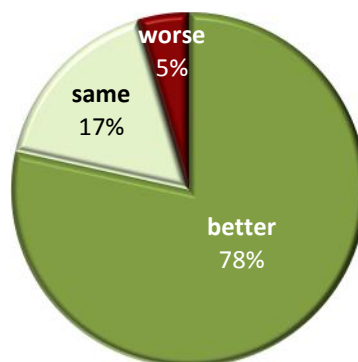


SOE, a significant area of the company land had been retired from coffee production and was awaiting government permission to replace the old coffee with a combination of new coffee and other crops. Some companies still leased old trees to farmers for one or two years at a time although these leases were routinely and repeatedly extended to the same farmers. The focus group with a high proportion of farmers having such short term leases expressed concern with the lack of incentive for taking measures to improve the long-term productivity of the coffee.

As a counterpoint to these factors, however, farmers’ propensity to be certified is inversely related to the reputation for soil quality in the village. Since the villages are associated with SOE companies, this suggests that companies opting for certification may have seen it as a way to gain market advantages to compensate for a more difficult productivity situation than faced by companies with better growing conditions.<sup>6</sup>

Finally, although the select focus group farmers expressed some dissatisfaction with their land tenure and coffee productivity, 168 certified farmers surveyed revealed that 78 percent were somewhat or very satisfied with their economic circumstances compared to before certification. While this is a considerable majority of farmers, 5 percent said their economic circumstances were somewhat or much worse than before certification. The foregoing discussion may give some insight into the reasons for the both the high satisfaction and the higher than desirable dissatisfaction.

**Figure 7. Economic Perception**

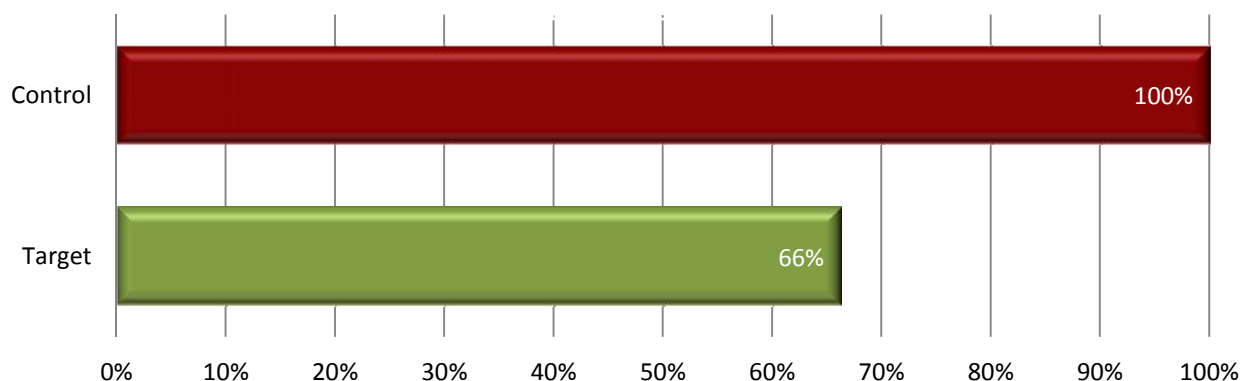


### Competitiveness

The COSA indicators that provide a window into farmers’ competitiveness include the degree to which farmers obtained information about their marketing environment, their understanding of factors that help set the prices they get, and specific quality measures. Certified farmers did not show an advantage in knowledge about their marketing environment. Only 66% said they understood how prices were set for their coffee compared to 100% of control farmers. It is possible that this lack of understanding about price setting contributed to the unhappiness in the certified focus group about companies’ policies. This could be an area of relatively easy improvement. We did not find any significant differences between certified and control farmers in the number of different price sources that they accessed.

<sup>6</sup> For testing whether companies improved in yields and profitability over time, a baseline survey for before and after comparisons (and potentially a difference in difference analysis) would be useful.

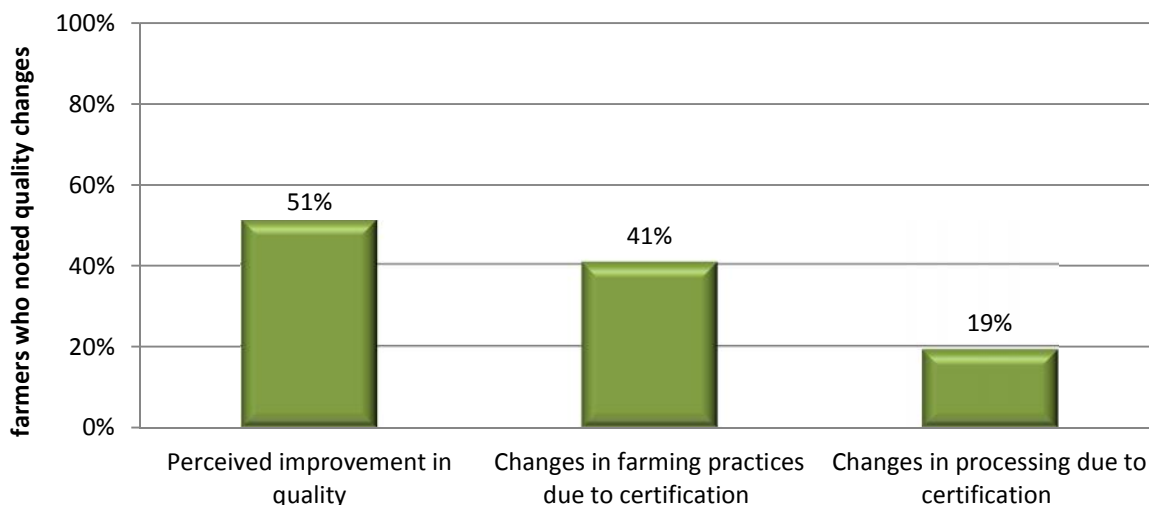
**Figure 8. Farmers understand price setting \*\*\***



On quality, neither certified nor control farmers knew about defect rates. However, a slight majority of 51 percent of certified farmers perceived their coffee quality had improved since certification. Of these, 41 percent attributed the improvement to changes in farming practices due to certification and 19 percent to changes in processing practices due to certification (these were not mutually exclusive). The lower percentage citing improvements in processing may reflect that two of the companies bought only fresh cherry, so the farmers did not process.

In interviews, the certified companies perceived a much stronger impact of certification on quality than the farmers expressed. All SOE representatives mentioned that even though they already had standards regarding the allowable rate of unripe cherries that could be in farmers' coffee, certification had caused closer monitoring and an improvement in this area. The companies also generally said that certification improved conditions in the warehouses and led to greater cleanliness. Finally, as already mentioned, the companies all claimed that certification increased the perception of their coffee's quality making it easier to market.

**Figure 9. Perception of quality changes and attribution**



There were no significant differences in terms of access to credit. The certified group received 46% of the loans requested. Farmers in the focus groups mentioned credit for investment as a factor in potentially further improving their coffee production.

## Social Sustainability

Results for social sustainability impacts of certification were mixed but generally positive for UTZ certification.

### Basic rights

On indicators for basic human rights, control farms performed at a high level, so there was little scope for certification to result in improvements. The table shows the mean performance by the certified sample group on these indicators. No significantly different performance was detected for the control group.

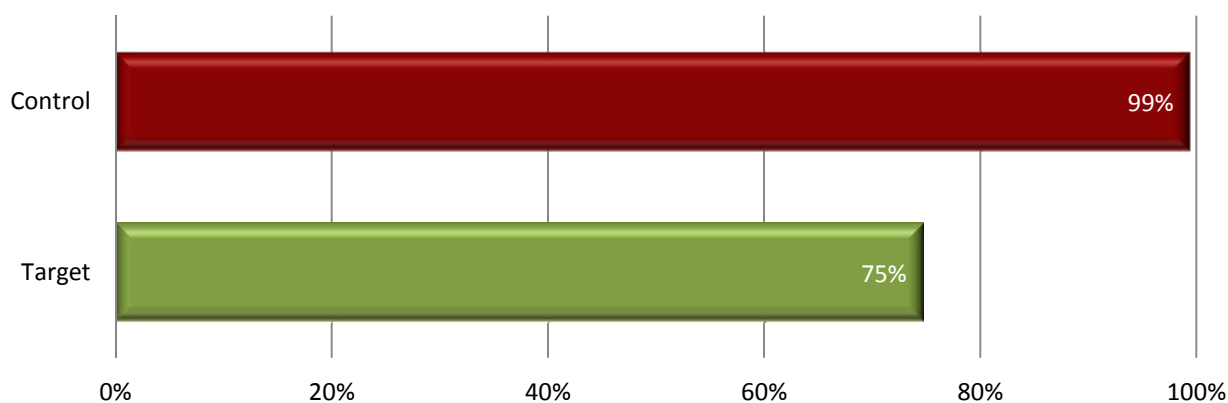
**Table 10. Basic rights**

Indicator	Mean score for certified farmers
Number of days a member of farm family did not have enough to eat during the last production year = 0 days	87.0%
Same but = 1-9 days	5.2%
Same but = 10-29 days	3.2%
Same but = 30 or more days	4.5%
Average number of farm injuries serious enough to require treatment from a medical practitioner	0.006 injuries
Households with water considered safe to drink requiring travel of more than 20 minutes from the home	0.6%
Access to medical care – households with a medical facility less than 1 hour away	100%
Affordable medical care	100%
Children in school regularly enough to be at the grade level that is appropriate for their age	81.2%

Although these measures are generally good, two stand out for more attention. First, nearly 90% of households did not experience any hunger in the last production year. Still 4.5 percent of households experiencing 30 or more days is higher than preferable and suggests vulnerability to the numerous negative consequences of prolonged hunger. Also, 19 percent of children not being at grade level represents an opportunity for improvement. These two indicators, in particular, however, are not ones that UTZ or other certifications are likely to directly influence in a significant manner in the short term. Nevertheless, one theory of change model for certification to improve performance in the vital areas of education and food security is that it will increase incomes which in turn allow families to purchase more food, reduce their need for children's labor in the fields, and make them better able to afford school costs.

Control farms did outperform target farms in one social measure – percent of households with ventilation for cooking smoke, which is a global proxy for quality housing and general family health. The indicator has its basis in the professional literature on family health in developing countries and in poor rural areas especially, which finds that girls, women and young children who are continuously subject to indoor cooking smoke have a much higher incidence of major health issues such as respiratory diseases and ocular problems. For COSA this is a social indicator of poverty and well-being that is likely to reduce the viability and thus the sustainability of a family or community. As indicated in Figure 10, a significantly greater percentage of control than target households had ventilation. The two villages with the highest rate of homes without ventilation also had the highest percentage of minority members for whom this is a traditional practice. This indicator points to a dilemma for sustainability initiatives facing specific local circumstances or customs that may run counter to widely accepted best practices. Nonetheless, the indicator is specifically designed to discover where certain practices – whether traditional or not – can be detrimental to wellbeing. Furthermore the data was mixed on whether lack of ventilation was entirely determined by minority membership. The village with the third highest percent of minority members was a control village where no homes were without smoke ventilation.

**Figure 10. Farm households with ventilation for cooking smoke\*\***



### Safe work environment

A significantly higher percent of certified farmers restricted 2 or more vulnerable groups (people under 16, pregnant women, and untrained persons) from applying agrochemicals. As far as farms that used agrochemicals supplying protective gear for those who applied them (including the farmers themselves), we did not find significant differences between certified and control farms. As the table shows, rates for certified farms were high for providing at least one item of protective gear and declined to 78 percent for 3 items or more of protective gear. Choices for gear were plastic or rubber gloves, breathing masks (not just handkerchiefs), protective outer clothing (covering body with impermeable material), and rubber or plastic boots.<sup>7</sup>

The lack of significant differences between the certified and control groups is surprising given that all four certified companies interviewed said certification had brought greater focus on the importance of protective clothing and some companies were supplying clothing. In this case however, the quantitative data from 351 field survey responses provide greater weight as to impact.

<sup>7</sup> These rates are only for farmers that use biocides. Farmers not using them are left out of the calculation.

**Table 11. Protective gear for applying agrochemicals**

Number of items of protective gear	0 items	1 or more	2 or more	3 or more
% reporting use	2.9%	97.1%	91.3%	78.3%

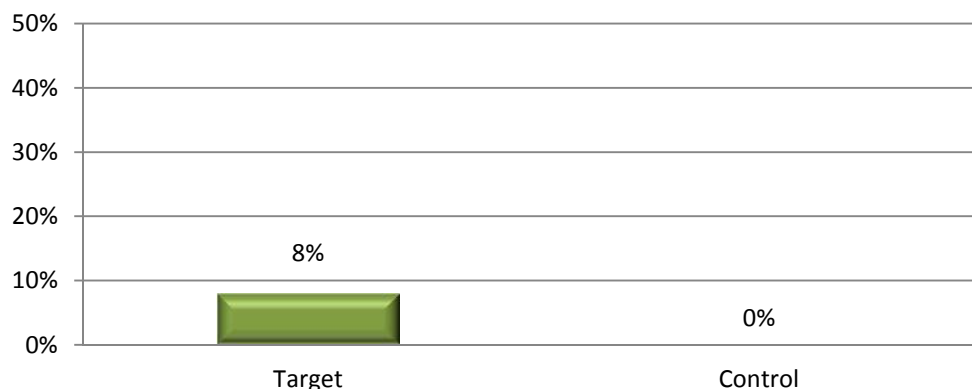
### Community participation

There was mixed evidence for indicators of stronger producer groups and community. While a significantly greater percentage of certified farmers contributed to building community infrastructure, still only 8% of certified farmer had participated as Figure 11 illustrates. No significant differences in group participation in governance emerged between certified and control farmers. Participation was similarly high among both groups for attending meetings and voting. As Table 12 reveals, certified farmers did well on average. As expected, the percentage is much lower for taking on the leadership activities of being a delegate or executive of a group.

**Table 12. Community participation in governance**

Activity with group	Being a member	Attending meetings	Voting	Being a delegate	Being an executive
% participating	99.4%	100%	87.6%	49.6%	5.7%

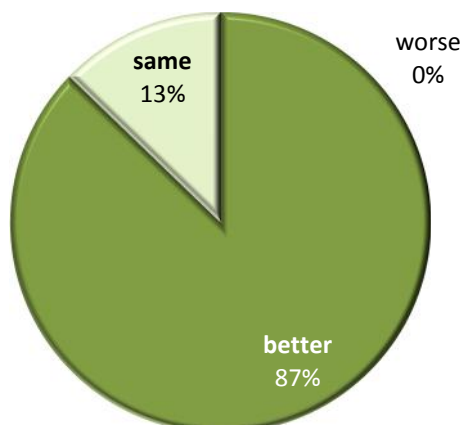
**Figure 11. Farmers participating in community projects\*\***



### Perception

Certified farmers themselves perceived that certification had a positive effect on group and community relations. Eighty seven percent of farmers said community relations improved (somewhat or greatly) since certification while no farmers said community relations became worse. The farmer focus groups suggested that at least some participants from the certified group had developed a network of contacts with neighbors. While interesting for further investigation, the evidence is not strong enough to form a definite conclusion.

**Figure 12. Social perception**



## Environmental Sustainability

### Resource management

The certified sample group had generally positive impact on indicators of environmental sustainability, particularly resource management. The certified farmers' greater efficiency in agrochemical use discussed under economic sustainability also translated into environmental benefits.

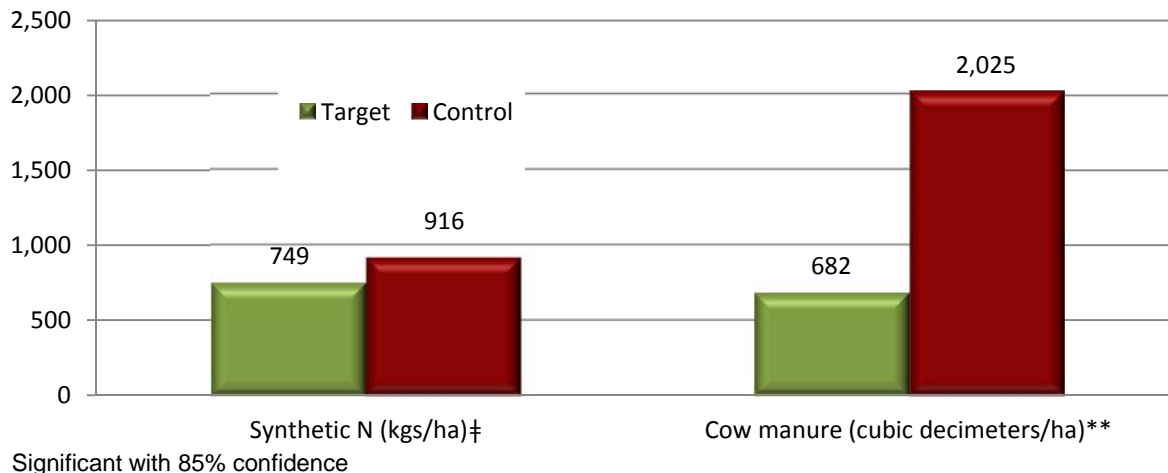
Interviews with the certified companies suggest that these results were not completely driven by UTZ. The companies all said they incorporated some similar protocols before certification. However, they also all said that the UTZ record keeping requirements inspired better monitoring of resource use. All the companies reported that UTZ training created increased awareness of water issues among farmers. They also commented on UTZ requiring the use of meteorological information in creating irrigation plans. The farmer focus groups also gave corroboration for UTZ having environmental impact since the group from the certified company demonstrated greater awareness of environmental issues than the group from the control company.

### Fertilizers and biocides

At an 85 percent level of confidence, certified farmers applied less nitrogen per hectare than control farmers. Applying less nitrogen is not always good indication of sustainability because it can result in mining of soil nitrogen without replacing this very important nutrient. However, in our sample, certified farmers applied an average of 749 Kgs nitrogen from synthetic sources per hectare while control farmers applied 916. Certified farmers also applied an average of 0.68 cubic meters of cow manure per hectare while control farmers applied 2 cubic meters, a significant difference. Certified farmers applied an average of 1109 Kgs of all other forms of natural fertilizer per hectare. Control farmers did not apply a significantly different amount. These natural fertilizers have somewhat low percentages of nitrogen, but improve soil quality in additional ways. Given that the rate of nitrogen application is reasonably high, the reduced rate for certified farms has the potential to result in less nitrogen run-off and other forms of leaching

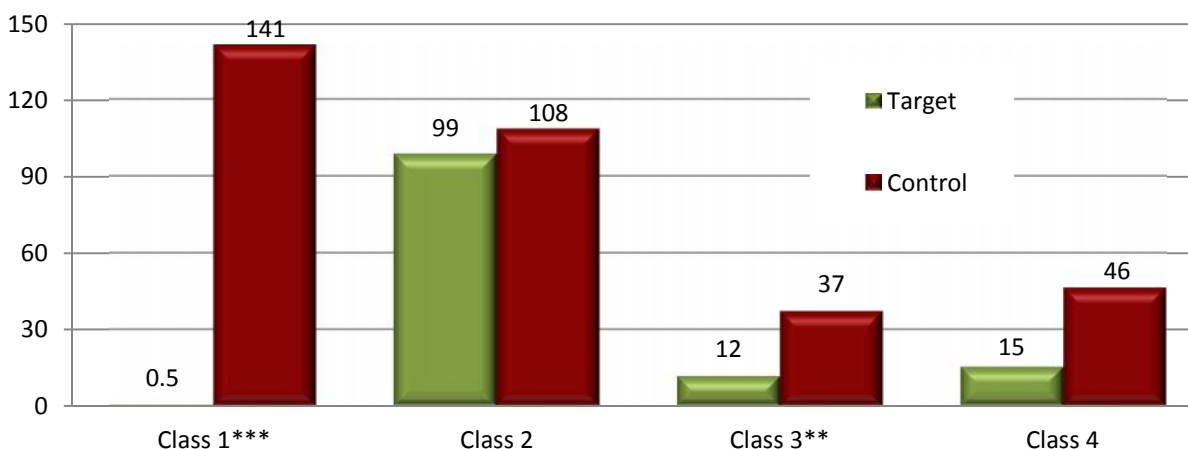
into ground water – an environmental benefit. Furthermore, lower amounts of synthetic nitrogen used means lower amounts of energy consumed in fertilizer production which could have positive climate change effects.

**Figure 13. Nitrogen/fertilizer use**



Impacts on biocide use were more significant than nitrogen impacts. Certified farmers used an average of only 0.5 grams of Class 1 toxicity biocides<sup>8</sup> compared to 141 grams per hectare on control farms, a difference that is significant with higher than 99% confidence. These amounts may appear small, but Class 1 toxicity ingredients are extremely potent. Data for certified farmers indicates a tendency to use fewer biocides overall, compared to control farms.

**Figure 14. Amount of biocides used by toxicity class (grams/ha)**



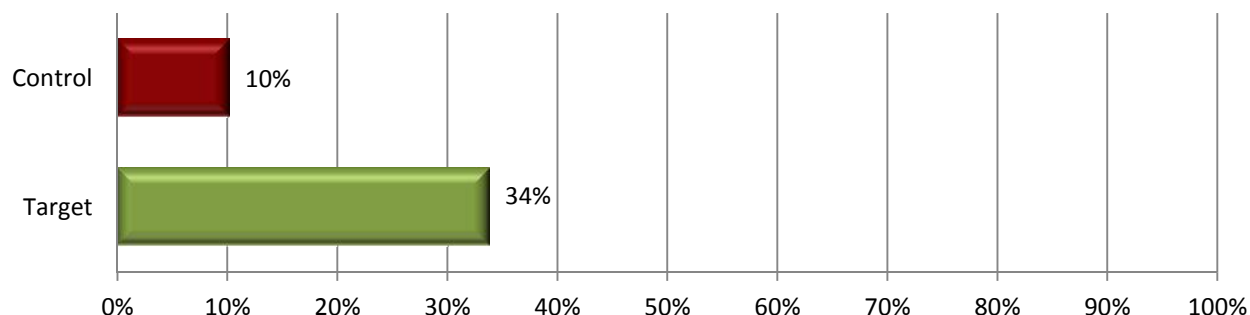
Certified and control companies alike employ agronomists and consult with experts on best farming practices. Companies suggest that certification provides more consistent monitoring and some additional training. If this applies, then more consistent monitoring and practical training could help farmers to have more rational fertilization and biocide use.

<sup>8</sup> These formulations are classified by the World Health Organization and contain extremely hazardous active ingredients of various synthetics such as Parathion or Hexachlorobenzene.

## Water

Certified farms also exhibited greater efforts to manage water use. Thirty four percent of certified farmers employed at least one measure to conserve water, compared to ten percent of control farmers, a significant difference. Water saving measures reported were using more efficient targeted irrigation equipment, water catchments, and low water pulping systems.<sup>9</sup>

**Figure 15. Farms using one or more water-saving measures\*\***



We did not find any significant differences between certified and control farms in measures to prevent water contamination. The percent of certified farms using one or more measures to prevent water contamination was 71 percent, while only 16 percent of certified farms used 2 or more measures. Options reported were: “not cleaning agrochemical equipment near water sources (for farmers who used agrochemicals)”; “not keeping animals near water sources”; and “prevent domestic run-off from entering water sources”.

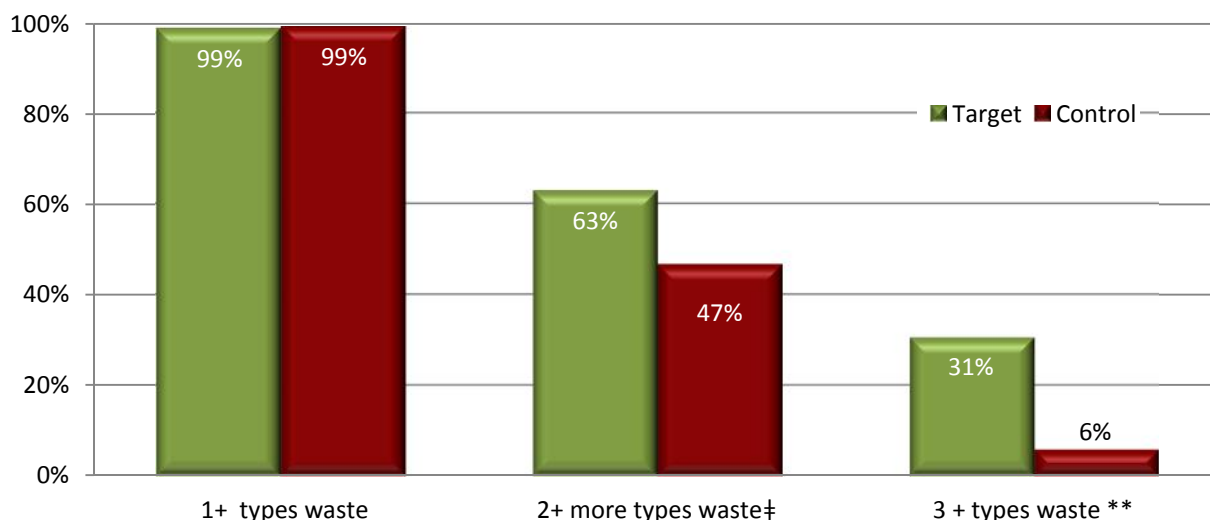
## Recycling

We found that while both certified and control farms had a high percentage of farmers who recycled at least one type of material, certified farms were much more likely to recycle multiple types of materials. Certified farms were five times more likely, on average, to recycle 3 or more types of materials. Still that number accounted for only thirty-one percent of all certified farmers, a number that could be improved.

<sup>9</sup> Several SOE in our sample purchased fresh cherry coffee, so the farmers would not have a need to acquire the capacity to use low-water pulping systems.



**Figure 16. Farms recycling wastes**

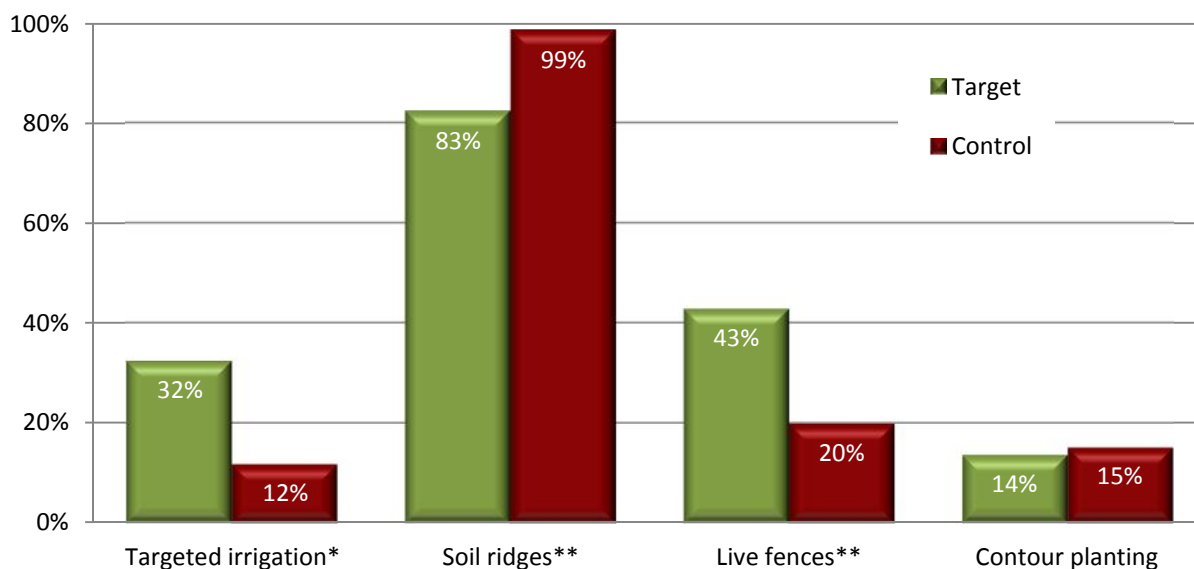


Significant with 84% confidence

**Soil conservation and soil-water measures**

Both certified and control farmers using soil ridges to retain soil, moisture and nutrients was high, but the 99% rate for control farms was significantly higher than the 82% rate for certified farms. Contour planting was the next most used soil conservation measure with 13% of certified farms using it. We did not find the rate for control farms to be significantly higher. Company interviews identified a greater concern with wind erosion of soil than water erosion in the Daklak area indicating that some measures of erosion control would be more desirable than others except where there are steep slopes. Certified farmers appear to have adopted better strategies to combat this. For example, 43% of certified farms planted live fences, significantly higher than the 20% of control farms.

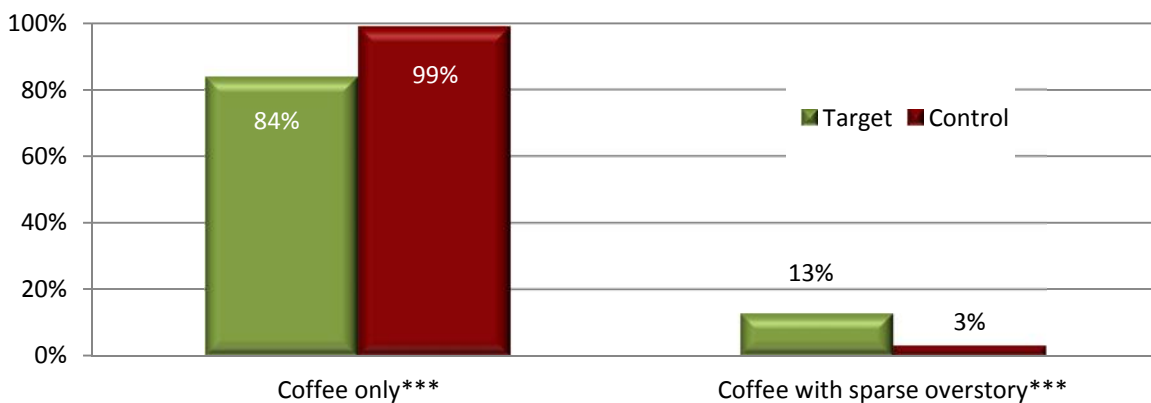
**Figure 17. Farms using conservation practice**



### Biodiversity

Coffee farms in the region tend strongly toward monoculture when mature and are initially intercropped with food or even spices such as black pepper. Certified farms had significantly lower percent of completely monoculture coffee with 84% while control farms had 99%. Conversely, 13% of certified farms have a sparse overstory of other trees, while only 1% of control farms have even this. While the certified farms do perform better in this regard, the biodiversity level is still low. UTZ explains that this is consistent with its standard which encourages, but does not require any shade and advise farmers to do what is most appropriate agronomically for the situation. The companies and farmers in focus groups both said that some shade was important for coffee production, but that all the space for shade trees had been used.

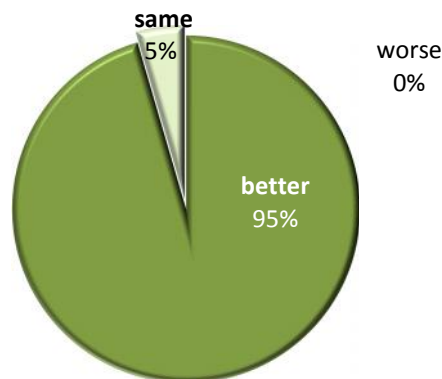
**Figure 18. Farm area: monoculture and biodiversity**



### Farmer perception

Both companies and farmer focus groups said certification had contributed to cleaner environments throughout the production chain, with coffee fields as well as processing centers more litter free and better organized. Both reported that farmers now buried refuse, often as an alternative to burning it. Similarly, the farm-level surveys showed that certified farmers perceived that certification had a positive effect on their community’s care for the environment as noted in Figure 19 below.

**Figure 19. Farmer perception: community care of the environment after certification**



## 6 Conclusions and Lessons

The COSA assessment does not only observe the specific objectives or the strengths of an organization's interventions, it also observes a range of possible intended and unintended effects in the social, economic, and environmental dimensions. We recognize the value of UTZ Certified's determination to submit to an independent assessment of their efforts in Vietnam and to also partner actively in the subsequent learning process.

There are two levels of usefulness for this information. First is the understanding of the tangible outcome of UTZ Certified efforts with coffee farmers in the Daklak region, and second are the lessons learned about the most effective ways to do such research or assessment work so as to best understand the intrinsically complex impacts of certification efforts. In our view, this represents an opportunity for progress, and the findings should serve as a tool for management to better target or adapt the specific work in order to affect more positive change. It is naïve to assume simple linear causality from an intervention to an outcome since experience indicates that sustainability is intrinsically multi-dimensional and not easily reducible to one aspect; there are often trade-offs to consider.

For UTZ Certified producers it appears that there are significant benefits to be acknowledged. These include:

1. Maintaining very high production levels while reducing use of toxic pesticides and synthetic nitrogen,
2. Offering a vehicle for market recognition of good practices,
3. Generally good overall environmental performance including farmers using water-saving measures and recycling multiple types of materials.

Superior productivity, a hallmark of UTZ farmers in some other settings that COSA has studied, was not evident in this case among farmers who are already pushing their soil and resources to the limit with world-leading yields. We should not expect it to be, especially if added productivity may have substantial environmental trade-offs. There were other indicators where performance was high for both target and control groups, leaving very little room for improvement- including most 'basic rights' indications such as access to safe water, access to affordable medical care, and participation in farmer groups.

The significant breadth of the COSA evaluation process – going beyond the theory of change - is expected to shed light not only on what is changing but also on areas of unexpected outcomes or impacts. COSA experience strongly suggests that it is not useful or realistic to expect that certified producers will always do better on every indicator than a comparable control group. Indeed, it is important to note that one cannot expect any standard with limited resources, including UTZ Certified, to dramatically alter the conditions of small farmers and consistently achieve benefits that decades of large investments and development projects have often failed to deliver. Further, UTZ has worked with and certified some disadvantaged groups such as ethnic minorities and those with a large proportion of women to achieve notable results.

Yet, it is interesting from a management perspective to note where benefits are not consistently evident and so offer an opportunity to improve. In several areas the differences between UTZ Certified farmers and the uncertified control farmers were not found to be significant or, in some cases, favored the control groups. On the economic side, these include price and revenue (no significant difference found) and lower awareness about how prices the certified farmers receive

are determined. On the social side, the survey found equivalent results for certified and control farms on the benchmark indicators of education and food security. Even though these have complex causes, the UTZ program, as part of its sustainability commitment, may want to consider ways to influence them, as they are among important signs or signals of overall well-being, and improving conditions of insufficient food and inconsistent education would likely improve the long-term viability of coffee farming as a livelihood. Also, a lower percentage of certified farms had adequate smoke ventilation than control farms. This measure is a proxy for housing quality in general, but also is an indicator itself of a healthful environment for families.

These results reflect the situation in parts of Daklak where a high percentage of certified farms are associated with SOE. UTZ may have a stronger yield impact in settings where farmers are not associated with SOE and may not be guided by SOE staff agronomists. Interesting questions that have emerged from the work include a need to better understand the power of the SOE in the value chain - especially in terms of the specific benefits they provide- and how these relate to farmer price premiums and net income.

Field work, particularly in rural areas of developing countries, has been described as a set of lessons waiting to be learned. COSA too has drawn significant lessons from this process and has invested some of its own resources to ensure both a useful outcome and its own improvement. COSA surveys are getting streamlined and progressively better and analytics are getting more diverse and sophisticated. It was useful to integrate a mixed approach using both quantitative and qualitative methods for obtaining valid results. Our research work elsewhere has benefited from the results of investing more in the in-depth consultations with multiple local stakeholders during the initial stages to ensure the optimal application of the work and selection of samples and controls. Essentially, we've learned that it is critical to have an extensively greater level of preliminary investigation prior to the farm-level research and more substantial organization or co-op level surveys. Similarly, a fuller contextual understanding is vital after the work so, it is important to convene a closing workshop to facilitate the accurate interpretation of findings. This final workshop is also beneficial in determining how the findings can be best used by local stakeholders to improve the impact of sustainability interventions.

We suggest further discussion on a consistent internal measurement matrix of key factors that can be used to improve regular monitoring and reporting; COSA is working on such tools. This can facilitate ongoing self-understanding that could allow UTZ and its local partners to better manage their processes and maximize benefits for farmers.

Finally, as with any analysis, findings must be tempered with the understanding that a first set of data observations can certainly be informative but are not definitive and are not necessarily representative of any longer trend. This report therefore offers an opportunity for learning and hopefully presents a sound basis for discussions about how to target and improve future measurement and even future outcomes.

\*\* \*\* \*

*Thanks for the opportunity to learn together.  
The COSA team*

## 7 Appendices

### Appendix 1. Instrumental Variable Analysis

The main challenge in impact evaluation is to find a good counterfactual; in other words, the situation that the participants would have experienced in the absence of the program. In this sense, the economics literature acknowledges the existence of several approaches to address this potential selection bias in participation that might affect the assessment of the impacts of a particular program.

Impact evaluation is mainly a problem of missing data, because we cannot observe the outcomes of the program participants without the presence of the program. Without information on the counterfactual, the next best alternative is to compare outcomes of a group of beneficiaries and a group that has not been exposed to the program. In doing so, we need the comparison group to be as close as possible to the treated group. Equation (1) shows a simple method to compare the outcomes (Y) of treated and not treated groups (T)<sup>10</sup>, controlling for a set of covariates (X)

$$Y_i = \alpha X_i + \beta T_i + \varepsilon_i \quad (1)$$

When the intervention or treatment is assigned randomly, we would expect that both, target and control group face similar characteristics. However, when the target is assigned purposely, we incur in a selection bias problem, where there might be important differences (observable or unobservable characteristics) between the target and control group. In terms of our model (Equation 1), selection bias is represented by a correlation between unobserved characteristics contained in the error term and the target group selection (T), violating the basic assumptions for estimating a simple OLS model for equation 1.

One way of dealing with selection bias is to perform Propensity Score Matching (PSM) methods to assume that the balance a set of observables in the target and control groups by identifying a common support (sub-sample with common characteristics). Weights are assigned to the control group observations in order to minimize the potential selection bias. However, this type of analysis accounts only for bias from observables but not unobservables. In addition, when the intervention or treatment is assigned to a particular group with specific characteristics that are systematically different from the control groups, the balancing property is often not met, and therefore the power of the PSM technique is minimized

Another way to deal with selection bias and especially unobservable characteristics that vary between the target and control groups is by using Instrumental Variables (IV), allowing for endogeneity (factors that affect individual participation). This approach consists in finding a variable or set of variables that are highly correlated with the participation, but is (are) not correlated with unobserved characteristics affecting outcomes or the outcome directly. Instruments however, should be selected carefully to maximize the potential of this impact evaluation technique.

The IV technique accounts for the possible selection bias (correlation between the target (T) and the error term (  $\varepsilon$ )), by selecting an exogenous variable (denoted Z) that satisfies two conditions: (1) Correlated with the target (T); and (2) Uncorrelated with the error term. This allows to the isolation of the effect of T over the estimated outcomes (Y).

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<sup>10</sup> T is a dummy variable that takes the value of one for the treatment or target group, and zero for the control group

## Appendix 2. Data

This data table provides the statistics from the Instrumental Variable (IV) analysis described in Section 4 - Methods of this report. The mean for the target group is the raw mean. The difference ('diff column') is the effect of the treatment (in this case certification) as calculated by applying IV analysis. The mean for the control is estimated by subtracting the difference from the target mean.<sup>11</sup>

The standard error corresponds to this "difference" and refers to the variability of this coefficient amongst the estimation. T-statistics, (T-STAT), which are calculated from the standard error, express the probability that the target and control POPULATIONS really have different means, given the SAMPLE results.

A high t-statistic indicates statistical significance - that is, that decision-makers can be confident the target group really performed differently than the control group. A low T-statistic indicates that the project samples did not detect a difference in the sample means great enough to confidently reflect a true difference in the performances of the target and control populations.

As explained in the inside cover, the report uses asterisks to indicate significance. One asterisk indicates at least 90 percent probability that the target and control groups are different; two asterisks indicate at least 95 percent probability and 3 asterisks indicate at least 99 percent. Results without asterisks are not significant, which is defined in our report as less than 90 percent probability of a difference. Insignificant results may indicate that the target and control population did not differ or that the difference was not visible because given the degree of variation among farms, the sample was too small to adequately detect impact on a specific indicator.

The specific probability of difference indicated by the T-statistic varies slightly from indicator to indicator, but a general guide for the probability with the Vietnam samples of a difference is: a T-stat of 1.72 indicates 90 percent probability, 2.08 indicates 95 percent and 2.84 indicates 99 percent.

	MEAN (target)	MEAN (control)	DIFF	STD ERR of diff	T-STAT
<b>ECONOMIC SUSTAINABILITY</b>					
<b>Income</b>					
<i>All in USD/ha except where noted</i>					
Income calculated without reflecting the opportunity cost of unpaid labor (deductions are included in cost)	964.3	535.6	428.8	394.2	1.088
Income calculated without the cost of either unpaid labor or deductions	1,861.8	1,041.9	819.9	417.8	1.962
Cost - all fertilizers and biocides	1,263.9	1,965.3	-701.4	189.3	-3.705
Cost - unpaid labor	2,205.3	2,462.4	-257.2	252.1	-1.020
Cost - paid labor	267.5	432.2	-164.6	94.2	-1.748
Cost - total labor	2,472.8	2,898.7	-425.9	242.0	-1.760
Cost - deductions	897.4	401.0	496.4	162.5	3.056
Cost - other (annual depreciation of production assets, processing, reforestation)	386.3	585.5	-199.1	66.9	-2.975
Cost - total except for unpaid labor	2,818.6	3,467.5	-648.9	254.5	-2.550

<sup>11</sup> This method for inferring the mean sometimes results for the control group in estimates of aggregates not equal to the same figure calculated from estimated components (e.g. estimated income may not equal estimated revenue less estimated costs).

	MEAN (target)	MEAN (control)	DIFF	STD ERR of diff	T-STAT
Cost - total except for unpaid labor and deductions	1,921.2	3,011.5	-1,090.3	223.7	-4.875
Yield (Kgs. green bean equivalent/ha)	3,142.3	3,381.0	-238.7	321.2	-0.743
Price (Green bean equivalent USD/kg)	1.23	1.24	-0.01	0.02	-0.620
Revenue	3782.9	3996.8	-213.9	390.3	-0.548

#### Access to Credit

Credit received ratio	0.460	0.420	0.040	0.118	0.339
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#### Food Security

*% farms where any family member did not have enough to eat during the last production year for ranges of days shown*

0 day	0.870	0.884	-0.014	0.030	-0.460
1-9 days	0.052	0.055	-0.003	0.018	-0.174
10-29 days	0.032	0.036	-0.004	0.010	-0.371
30 or more days	0.045	0.035	0.011	0.013	0.856

#### Access to Market Information

*Price information that farmers have access to: immediate buyer/producer group; different buyers throughout region; government; global reference price; the price the farmer's buyer received for the crop.*

% having 0 sources of information	0.597	0.417	0.181	0.123	1.471
% having 1 or more sources	0.403	0.583	-0.181	0.123	-1.471
% having 2 or more sources	0.182	0.300	-0.118	0.099	-1.196

#### Quality Practices in Cultivation and Processing

*Practices farmers used for treating coffee cherries before and after pulping and used for post-harvest processing or drying the coffee.*

Quality improvement	0.510	-0.053	0.563	0.101	5.588
Quality improvement due to farm change due to certification	0.407	-0.120	0.527	0.097	5.427
Quality improvement due to processing due to certification	0.193	-0.063	0.256	0.074	3.467

#### Farmer Participation Levels in Groups

% delegate participation of total sample group	0.496	0.491	0.005	0.118	0.044
% executive participation of total sample group	0.057	0.133	-0.076	0.079	-0.960
% meeting participation of total sample group	1.000	0.991	0.009	0.026	0.355
% voting participation of total sample group	0.876	0.820	0.056	0.086	0.647

#### Farmer Perceptions - Economic

*Percent farmers whose quality of life worsened, unchanged, or improved since the prior year*

worse	0.046	NA			
same	0.169	NA			
better	0.785	NA			

	MEAN (target)	MEAN (control)	DIFF	STD ERR of diff	T-STAT
<b>SOCIAL SUSTAINABILITY</b>					
<b>Farm Injuries</b>					
<i>Percent of farms with injuries serious enough to require treatment from a medical practitioner</i>					
	0.006	0.020	-0.014	0.016	-0.886
<b>Farms with Agrochemical Restrictions</b>					
<i>Farms that apply restrictions as to who applies any agrochemicals (including ferts)</i>					
		perfect colinearity			
% with 1 or more restrictions		0.903	0.135	0.076	1.771
% with 2 or more restrictions	0.903	0.768	0.135	0.076	1.771
<i>% of the farms that use synthetic biocides and apply restrictions on who uses them</i>					
% using biocides with 0 restriction	0.022	0.142	-0.120	0.069	-1.745
% using biocides with 1 or more restrictions	0.978	0.858	0.120	0.069	1.745
% using biocides with 2 or more restrictions	0.891	0.712	0.179	0.110	1.635
<b>Farms With Protective Gear (agrochemical application)</b>					
<i>Of those who answered, the number of types of protective gear used</i>					
0 items	0.029	0.027	0.002	0.013	0.179
1 or more items	0.971	0.973	-0.002	0.013	-0.179
2 or more items	0.913	0.887	0.026	0.043	0.603
3 or more items	0.783	0.843	-0.060	0.114	-0.530
<i># items gear if answered and if biocides used</i>					
of answered, % of using biocides with 0 items	0.070	0.083	-0.013	0.042	-0.313
of answered, % of using biocides with 1 or more items	0.930	0.917	0.013	0.042	0.313
of answered, % of using biocides with 2 or more items	0.860	0.863	-0.003	0.100	-0.030
of answered, % of using biocides with 3 or more items	0.791	0.697	0.094	0.146	0.643
<b>Living Conditions</b>					
Smoke exits kitchen by chimney or fan (Yes=1)	0.747	0.994	-0.247	0.088	-2.808
Water available more than 20 mins. from home	0.006	0.006	0.000	0.000	0.939
<b>Medical Access</b>					
% farms with accessible medical care (medical facility less than one hour away)	1.000	1.000	0.000	0.000	
% farms with affordable medical care of all farms answering	1.000	1.000	0.000	0.000	



	MEAN (target)	MEAN (control)	DIFF	STD ERR of diff	T-STAT
<b>Children's Education</b>					
<i>Percent of children at appropriate grade level for their age (ratio to total n. of children in household)</i>					
	0.812	0.805	0.006	0.084	0.074

<b>Training</b>					
<i>Training attended (type, cost, hours)</i>					
Hours of training total	12.234	8.823	3.411	1.610	2.119

<b>Community Relations</b>					
% of farms participating at least one community project	0.078	0.000	0.078	0.047	2.673

<b>Price Formation</b>					
% of farmers always or sometimes understanding price setting	0.662	1.000	-0.338	0.122	-3.883

<b>Farmer Perception - Social</b>					
<i>Percentage of farmers indicating that their perception of community relations is much better, better, the same, worse or much worse compared to prior year.</i>					
much worse	0.000				
same	0.128				
much better	0.872				

## ENVIRONMENTAL SUSTAINABILITY

	MEAN (TARGET)	MEAN (CONTROL)	DIFF	STD ERR of diff	T-STAT
<b>Water Conservation Measure</b>					
% of using ridges	0.825	0.987	-0.162	0.061	-2.672
% of using contour planting	0.136	0.151	-0.015	0.073	-0.202
% of using live fences	0.429	0.199	0.230	0.119	1.934
% using water-saving measures	0.338	0.101	0.236	0.105	2.253

<b>Water Contamination Prevention Measures</b>					
<i>Percentage of farmers using water safety measures</i>					
% with 0 measure	0.286	0.359	-0.073	0.104	-0.702
% with 1 or more measures	0.714	0.641	0.073	0.104	0.702
% with 2 or more measures	0.156	0.078	0.078	0.089	0.879

<b>Farms Recycling - Reusing Waste</b>					
<i>Average number of different waste materials farms recycled or reused</i>					
% with 0 types of materials	0.013	0.013	0.000	0.000	
% with 1 or more types of materials	0.987	0.993	-0.006	0.004	-1.282
% with 2 or more types of materials	0.630	0.467	0.163	0.112	1.457
% with 3 or more types of materials	0.305	0.059	0.246	0.096	2.574

	MEAN (target)	MEAN (control)	DIFF	STD ERR of diff	T-STAT
<b>Amount and Toxicity Class of Biocides Used (kg/ha)</b>					
Toxicity class I	0.000	0.141	-0.141	0.045	-3.134
Toxicity class II	0.099	0.108	-0.010	0.049	-0.198
Toxicity class III	0.012	0.037	-0.025	0.011	-2.398
Toxicity class IV	0.015	0.046	-0.031	0.042	-0.738

<b>Use Levels of Synthetic and Natural Fertilizers for N, P, K Use Efficiency</b>					
N kg/ha	748.895	916.441	-167.546	110.347	-1.518
Total kgs. natural fertilizer per ha	1109.370	993.726	115.645	602.985	0.192
Cubic meters cow manure per ha	0.682	2.025	-1.343	0.598	-2.244
% of group using natural fertilizer	0.364	0.501	-0.138	0.114	-1.206

<b>Biodiversity</b>					
<i>Biodiversity of farm land, percentage by type</i>					
Picture 1 - Grassland, row crops (no trees at all)	0.000	0.000	0.000	0.000	
Picture 2 - Permanent tree crops (monocrop)	0.838	0.989	-0.151	0.036	-4.231
Picture 3 - Permanent crops with sparse overstory	0.128	0.032	0.096	0.025	3.768
Picture 4 - Compared to Picture 3 areas, these have denser overstories & more species	0.022	0.007	0.015	0.012	1.296
Picture 5 - Compared to Picture 4 areas, Picture 5 areas have denser overstories and more species	0.000	0.000	0.000	0.000	
Picture 6 - These areas have an overstory with density and species variety almost like forest	0.000	0.000	0.000	0.000	
Picture 7 - Natural (or restored) forest with no permanent or other crops	0.000	0.000	0.000	0.000	

<b>Farmer's Perception – Environment</b>					
<i>Percentage of farmers indicating that their care of the environment is better, same or worse compared to prior year.</i>					
worse	0.000				
same	0.037				
better	0.963				

<i>Percentage of farmers indicating that their community's care of the environment is better, same or worse compared to prior year.</i>					
worse	0.000				
same	0.045				
better	0.955				

### **Appendix 3. Methodological progression and key lessons**

This assessment process of UTZ Certified farmers in Vietnam was the very first application of the COSA sustainability measurement system in Asia. This effort served as a vetting process for the approaches and as a field test to establish a basis for further measures of change to determine if there are significant differences between UTZ Certified farmers and similarly matched control groups. Unique features of the Vietnam coffee value chain challenged COSA to evolve these methodological approaches even further, resulting in tools that offer more reliable learning results for UTZ Certified as it pursues its goal to improve futures for farmers. The Vietnam assessment used a mix of qualitative and quantitative methods to generate an understanding of some of the important potential impacts of UTZ certification on the sustainability of coffee production in Daklak. Initially, we classified and then analyzed the data using a PSM approach. We conducted a stakeholder workshop in Daklak to review the results with many of the key actors in the coffee value chain in Daklak, including representatives from SOE, traders, Agriculture Ministry, research organizations, farmers, regional development organizations and UTZ Certified.

The workshop and an expert advisory panel concurred that the analysis needed to account for different SOE policies and management since these could strongly influence farmer motivation, practices, and even yields. We also took the advice that we should be more exact about the effects of tree age. The COSA design already matched farms effectively on factors such as agro-ecological conditions and intensity of coffee farming in the regions. We had initially classed tree age only within broader groupings, but following the advice of the stakeholders, COSA analysts set about to control for these factors in order to isolate the impact of certification on yields. When we did control for this and for company policy, there were no statistically significant yield increases that could be attributed to certification. This result is consistent with information from SOE interviews and expert advisors conducted as part of the overall process.

These SOE policies were not easily discernible or even quantifiable due to the mixed packages of benefits that they offered to producers. In working out how to account for company policy, we found that our controls did not adequately match our targets on company policy parameters. While normally the pre-survey assessment done to match target and controls can uncover such information, the uniqueness and the somewhat opaque SOE influence in the realm of coffee production and how this difference could affect our sampling strategy was not apparent until after further investigation. Information on the SOE practices and policies are not readily available from any public sources and, since these semi-state-controlled management companies do not have a role in most coffee countries, we did not at first adequately capture the scope of their influence.

The heterogeneity of SOE policies and practices (see Costs section and Table 4) made it difficult to find measureable, equivalent parameters thus making it challenging to control for the differences among them in the matching framework. More information was added after follow-up and more than a dozen analytical combinations were tested and discarded when they did not stand up to scrutiny within the logic of the production system and the evidence from related data. It was determined that IV was a more optimal choice than PSM because of the applicability of IV to situations where control groups do not completely match target groups. Therefore, we re-analyzed the data using this approach and had much better confirmable results that also aligned with the more qualitative inputs to our analyses from stakeholder workshop, the expert panel, and SOE interviews.

## Appendix 4. Stakeholder Workshop Summary and Participants

The purpose of the workshop was to consult stakeholders and experts in the Daklak coffee sector to better understand and interpret the results of a COSA study on sustainability impacts of UTZ certification in Daklak; and validate if the results were consistent with the knowledge of the participants about actual conditions in Vietnam, particularly Daklak.

To explore this topic, UTZ-Vietnam and International, Solidaridad, WASI and COSA invited 36 people to participate in a day long discussion of the findings. (See Annexes 1 and 2). Key conclusions from the discussion were:

- The results of the COSA survey provided value, however many participants also expressed concerns that the study had not sufficiently taken into account the Vietnamese context because there was not sufficient consultation before the survey with experts involved in the Vietnam coffee sector.
- The methodology for attributing impacts to UTZ did not fully account for the differences in other factors that influenced performance between the control groups and the target group
- Concerns were raised that in some cases, the control groups were not good matches for the target groups, particularly because of different backgrounds of control farmers from target farmers and because management structures of control companies varied from the target companies.
- In general, the participants expressed that findings for most COSA sustainability indicators appeared realistic. Findings that participants did not find realistic or would need further analysis/explanation included yield, biocide use, prohibitions against using vulnerable groups applying agrochemicals and using protective gear for agrochemical application. For other indicators, participants found the results realistic but questioned whether the indicator was appropriate or if the information was put well into context, particularly for the planting shade tree indicator.
- To investigate whether the sample design led to results that did not sufficiently take into account factors beyond UTZ certification that influenced performance on indicators, COSA will convene an expert consultation to concur on both the model for attribution (propensity score matching model) and the sampling methodology. Using this input, COSA will reanalyze the data and revalidate among the experts.
- The expert consultation will facilitate an improved final report by assuring that relevant factors are accounted for and understanding is reached on the use of specific indicators. It will also contribute to a good working relationship among the partners.
- The workshop added value for COSA by advancing its development of mixed methods approaches that combine quantitative and qualitative methods. Challenges remain, particularly maintaining independence while addressing concerns of stakeholders.

## LIST OF PARTICIPANTS

Nr	Name	Job title/organization
1	Le Duc Huy	Vice director of Simexco
2	Not translated	Coffee farmer of Simexco's project
3	Nguyen Tan Dung	UTZ program manager of Drao Coffee Company
4	Not translated	Coffee farmer of Drao's project
5	Nguyen Van Moi	UTZ program manager of Eapok Coffee Company
6	Not translated	Coffee farmer of Eapok's project
7	Tran Minh Thuy	Director of Phuoc An Coffee Company
8	Not translated	Coffee farmers of Phuoc An's project
9	Not translated	Manager of 721 Company
10	Not translated	Farmers of 721 company
11	Not translated	Manager of Viet Duc Company
12	Not translated	Farmers of Viet Duc company
13	Not translated	Manager of Viet Thang Company
14	Not translated	Farmer of Viet Thang Company
15	Not translated	Manager of Farmer Association
16	Not translated	Farmer of F. Ass.
17	Le Noc Bau	WASI's director
18	Truong Hong	WASI's vice director
19	Bach Thanh Tuan	CDC's Director
20	Le Quang Binh	Cafecontrol Daklak
21	Luu Van Hoang	Cafecontrol Lam Dong
22	Ton Nu Tuan Nam	WASI
23	Le Van Duc	Crop department of MARD
24	Huynh Quoc Thich	Representative of DARD Daklak
25	Pham Van Tuoi	Representative of Extension center in Daklak
26	Dinh Cong Hoan	Representative of DARD in Lam Dong
27	Hoang Van Viet	Representative of Extension center in Gia Lai
28	Jonathan	Director of Dakman Coffee Company
29	Thomas	Director of Neumann Vietnam

## Appendix 5. Results of interviews of certified companies

### Purpose:

To develop a deeper understanding of the survey results – the opportunity to talk to representatives of the 4 certified SOE could give fuller information than simple closed-ended survey questions. Companies make the decision to become certified, and also, in Vietnam require many crop management practices. The input from 1) a Stakeholder Workshop to review initial COSA results from farmer surveys and 2) a subsequent consultation with regional experts also said that company policies and actions could have a strong influence on farmer results.

### Method:

The COSA-UTZ Vietnam team each contributed to question to discover the impact companies perceived UTZ to have had. The COSA representative reviewed the questions to eliminate any unintentional biases. The COSA research partner conducted the interviews in Vietnamese, then translated detailed summaries of the answers into English. COSA analyzed these answers and identified key findings.

### Key findings:

#### Methodology

- With/without comparison is reasonable for this setting. It gives a chance to see cert effects over time and all company responses say they couldn't determine if certification gave higher profits or yields due to changes from year to year in market and weather conditions.

#### Independent verification by trusted standards has benefits

- Enforces discipline in making sure that the company and farmers follow good practices already intended by the company.
- The above, plus more thorough record-keeping has made management for efficient and professional
- Customers have more trust and confidence in the product

#### Yield impacts

- Yields can be higher due to WASI training in grafting (possibly enhanced by UTZ). Because of this and other practices advocated by UTZ/WASI, trees are maintaining productive capacity longer.
- The UTZ training has covered fertilizer use. Companies' views are that use has gone down due to better knowledge and recording keeping. Thus, the training gave better fertilizer efficiency in producing similar amounts for less fertilizer (increased fertilizer efficiency), rather than more yield per land area (they did not use better fertilization practices to increase land use efficiency – but maybe they were at their peak in terms of land use efficiency and way over fertilizer, so reductions without yield declines would have very positive environmental benefits.

Below is a summary report of the key individual issues raised during the survey process.

**Summary: Individual issues**

<p><b>Size of Company in terms of coffee handled</b></p>	<p>For 3 out of 4 companies, UTZ accounted for either all or a majority of coffee sales, ranging from 957 to 3500 metric tons. For the fourth company, UTZ certified represented less than 10 percent of coffee sales.</p>
<p><b>Why obtain UTZ Certification?</b></p>	<p>All 4 companies cited increased market recognition, price premiums, and more competitive product because of certification. One company mentioned these benefits came from practices which they already used beforehand. One company mentioned the desire for more sustainability and one company mentioned that UTZ certification allowed the chance to meet and access farmers, and thus to have better access to purchasing coffee from them.</p>
<p><b>Training and technical advising for farmers</b></p>	<p>All 4 companies said they provide training directly to farmers on cultivation practices, such as irrigation, fertilization, pruning, weeding, harvesting, and pesticide control. While it was not always clear that these training happened solely due to UTZ, one company mentioned that trainings were now more practical regular and efficient. Comments from two other companies suggested also that UTZ contributed to efficiency and organization of training.</p>
<p><b>Do you have the feeling that farmers are applying what they have learned? Why or why not, and how?</b></p>	<p>All 4 companies felt that farmers applied their training. Two companies said farmers did so because the company forced compliance; one said they did apply the training but that it took time. One company gave these examples: Fertilization: the farmers applied 4 rights: right type, right time, right method., right amount. Some may not follow strictly but at least they were aware of these. Irrigation: noticed on time &amp; amount (just enough, not over-irrigating and applying flooding-irrigated). Pesticides: only use when needed and apply for infected tree only, rather than spraying the whole farm.</p>
<p><b>Profitability</b></p>	<p>The 4 companies all said they could not calculate changes in profitability due to variation in price from year to year. Instead, they cited premiums received for UTZ certification ranging from USD 35 to 50 per ton, depending on the company. Two companies also cited receipt of a quality premium ranging from USD 10 to 200 per ton. Only one company noted paying a premium to farmers for UTZ certification (USD 15 per ton).</p> <p>Three out of 4 companies mentioned than in addition to “visible” profit, UTZ provided “invisible profit” from improved reputation with customers arising from recognition of UTZ.</p> <p>One company mentioned a small saving accrued under UTZ due to better resource use.</p>
<p><b>Coffee productivity</b></p>	<p>All the companies reported that they had obtained training on improved grafting techniques and improved varieties. The companies all maintained that they would have applied these changes even without UTZ and would have seen some yield increase in any case. However, one company explained that UTZ caused consistent application of these factors as well as the input standard, use of shade trees, making contours, etc., which slowed down declines normally attending aging of trees.</p>

<b>Technical knowledge</b>	The companies generally agreed that UTZ did not cause change in technical practices because the companies already applied good practice for shade and replacement of old, unproductive trees.
<b>Coffee plantations</b>	Two out of 4 companies noted improved handling of wastes, including agrochemical waste. One company said the practices were in place before UTZ - though not as consistently applied. An additional company mentioned that the focus on compliance with the UTZ code improves plantation conditions.
<b>Planting, cultivation and Maintenance</b>	
<b>Evaluating quality of coffee plantation</b>	<p>In general, companies said that even before UTZ certification, they required practices regarding varieties and grafting for increased yields, optimized fertilizer use, improved pest control and reduced harvesting of unripe cherries.</p> <p>Two companies said UTZ helped reduce water use and water contamination. Also, two companies said that although they already had good practice in place, the UTZ requirements for monitoring farmers and for record keeping ensured requirements were followed.</p>
<b>Changes in practices</b>	
<b>Labor</b>	All companies said labor increased with UTZ certification. Reasons most often mentioned for increases were record-keeping, waste management, and training, though one company said that labor usage did not change after UTZ for weeding and selective harvesting because practices did not change after certification.
<b>Materials inputs (fertilizers, biocides, other significant inputs) became higher, lower or stayed the same?</b>	<p>Companies had mixed responses.</p> <p>Fertilizer: One said use declined while three said there was no change because company protocols already conformed with good practice.</p> <p>Biocide: Two companies said use declined due to better training in pest control. Two companies said use did not change, but one of the companies said that record-keeping and knowledge of prohibited substances improved.</p> <p>Water: Three companies said UTZ certification led to better awareness of water use, plus better monitoring and record-keeping, so water use was reduced. One company said irrigation water use remained the same, but also said that UTZ resulted in closer monitoring by the farmers.</p>
<b>Harvesting and post-harvest practices</b> <b>Processing practices</b>	All companies reported improvements to the worker safety, health safety and traceability aspects of storage after certification.
<b>Marketing</b>	



<p><b>Do you feel it is easier-harder for farmers to sell their coffee once they have become UTZ certified?</b></p>	<p>All companies reported easier coffee sales after UTZ certification, as well as improved customer loyalty. One company said they did not change practices significantly, but buyers had more trust in the UTZ label.</p>
<p><b>Quality</b></p>	
<p><b>Coffee quality</b></p>	<p>Two out of 4 companies said UTZ certification did not produce quality improvements because they already applied practices for good quality, however one of the companies noted that UTZ brought better supervision and record keeping which helped consistent applications. Two companies said UTZ helped ensure farmers consistently applied quality practices. Practices mentioned were selective harvesting to reduce the defect rate, proper fertilization, good varieties and good grafting for bean size. One company mentioned UTZ certification raised awareness among farmers of proper moisture content.</p> <p>One company mentioned that farmers received USD 0.15/kg for higher quality coffee. Another company said it got USD 0.40/kg for better quality of which USD.0.06-0.10 was passed onto farmers.</p>
<p><b>Soil protection Erosion prevention</b></p>	<p>One company acknowledged that UTZ training about reducing soil erosion may have increased farmers' appreciation of the issue. Three companies said before UTZ they required windbreaks, shade trees and basins to control erosion, but one company said that although they had soil erosion protocols in place, UTZ certification strengthened monitoring, made it more systematic and thus increased farmers' awareness.</p>
<p><b>Protection of forest patches, planting of shade trees, protected areas</b></p>	<p>Three companies reported that there were no nearby forest patches or protected area. One reported an UTZ-required reforestation project implemented in hills near coffee growing areas. Two companies reported more shade tree planting, though one company mentioned space limitations limited this effort. One company said shade requirements had already been met.</p>
<p><b>Waste collection &amp; re-use (e.g. composting)</b></p>	<p>All companies reported better management of wastes after UTZ certification, though one company said it already required the UTZ protocols before certification. Practice mentioned were burning wastes and recycling organic wastes either through composting or vermiculture.</p>
<p><b>Social Issues</b></p>	
<p><b>Farmer relations</b></p>	<p>Three companies said they had better relationships with farmers, two citing better benefits and pay as the reason. One did not state there were better relationships, but instead gave examples of difficulty communicating to farmers about certification.</p>
<p><b>Worker's care</b></p>	<p>All companies said that policies regarding working hours and dangerous work did not change after UTZ certification, as they already followed good practices and government regulations. Two</p>

	<p>companies said that even so, UTZ certification caused the company to be more cautious about providing protection to farmers applying agrochemicals. All companies also said farmers received better safety training with UTZ certification.</p> <p>Two companies said they provided medical insurance to farmers. One said that after UTZ certification, it provided contracts that include annual medical checks. Another company said that after UTZ it provided transportation to medical facilities in serious situations.</p>
<b>Children's care</b>	All companies said UTZ did not affect policies regarding children working in the coffee, as child labor was not allowed even before UTZ certification.
<b>Farmers' family situations</b>	The companies cited a range of different conditions affecting farm families. All companies mentioned better environmental conditions due to either better waste management or safer handling of agrochemicals. One company said this training was not due to UTZ, but both other companies attributed this to UTZ certification. Three companies cited better earnings for farmers, two noting the UTZ premium and one stating that the farmers learned UTZ practices on their company plots that helped them produce more on their own plots. One company said it changed from providing farmers with a 'holiday' bonus which farmers spent with little to show for it to providing a study encouragement fund. This same company also trained farmers to enjoy activities such as volleyball tournaments and created a reward fund which the company said gave farmers a more interesting life.
<b>Compensation and land tenure practices?</b>	One company owned no land and the other three followed government decrees setting 5 years as the length of leases with farmers. The exception is that one company has plots with aging coffee that may be replaced if it becomes unproductive. Currently the company signs contracts for only 1 - 2 years. Typically for all the companies with land, including for these short term contracts, farmers renew their contracts at the end of the lease term.
<b>What do you think about new traceability system now?</b>	All companies said traceability improved after UTZ certification. The companies also all said that record keeping and administration improved, which in turn improved organization and ability to look up information about farmers and production.
<b>Any other changes due to certification?</b>	Three companies found that UTZ certification lead to more consistent, organized, professional management. One company mentioned that UTZ also resulted in more frequent, practical training sessions.
<b>Management</b>	
<b>Has your company had to do any additional work that your company for UTZ certification? How many full-time staff do</b>	All companies said that UTZ has caused additional management work requiring specialized certification units. However, for 3 of the companies, workers did the certification jobs concurrently with other work, so the overall impact was not great. Furthermore, the required record-keeping has allowed management to be more

<p><b>you have that are responsible for organizing UTZ?</b></p>	<p>efficient since it is easier to look up information. Number varies.</p>
<p><b>Overall – improvements and challenges</b></p>	
<p><b>What aspects of UTZ certification presented the biggest challenges for the company?</b></p>	<p>Three companies said the biggest challenge of certification has been getting farmers to change old methods and to understand reasons for and comply with new requirements.  One company said treatment of waste water from wet processing has been its biggest challenge since the company cannot afford a water processing facility. The company also noted that the farmers do not have good domestic waste water management, but this is out of the control of the company.</p>
<p><b>Did certification produce any unexpected benefits/challenges?</b></p>	<p>All the companies said there were none.</p>
<p><b>What activities of the certification program have been most important for achieving any benefits you experienced?</b></p>	<p>All companies said there was no single activity that could be called most important since all UTZ criteria had to be met to get certified.</p>
<p><b>How satisfied are you with UTZ and why?</b></p>	<p>All 4 companies that answered said they were very satisfied.</p>
<p><b>Are there any aspects of UTZ that you would like to see changed?</b>  <b>What are these and how and why would you want them changed?</b></p>	<p>Two companies mentioned that assistance from UTZ on obtaining required meteorological data for irrigation plans would be appreciated. Two cited issues with waste water requirements. Other issues mentioned by single companies were inconsistencies between the agrochemicals allowed by the government and those allowed by UTZ as well as inappropriateness of requirements regarding housing and working conditions for small farms.</p>

## Appendix 6. Results of farmer focus groups

### **Purpose:**

To develop a deeper understanding of the survey results – the opportunity to talk to farmers could give fuller information than simple closed-ended survey questions.

### **Method:**

COSA proposed a script for the focus groups to elicit information on topics of interest. The implementation team reviewed and commented on the script. The research institute partner conducted the focus group in Vietnamese, with a translator present who translated answers into English, so all observers could propose further questions as the focus group progressed.

In order to observe contrasts, two focus groups were conducted – one with farmers from an uncertified company and the other with farmers from a certified company, both of which were COSA sample companies (however, the farmers were not necessarily sample farmers). The specific companies were selected due to availability and convenient logistics. Both focus groups took place in company or village facilities and in both cases, company management representatives observed the focus groups along with an UTZ International representative, a note taker from the research institute and the COSA project coordinator as well as the principal COSA analyst. Having the management representative present was not ideal from the perspective of encouraging unbiased discussion, however, we had no choice as we could not have held the focus groups otherwise. Also, it is notable that one of the groups expressed many negative opinions about the company, even with the manager present. Finally, the focus group method allows a deeper understanding of individuals' behaviors, attitudes and beliefs. However, because of the small number of participants, the information may not represent the total populations from which the participant come.

The uncertified group consisted of seven farmers, of which 2 were women. Years of experience with coffee ranged between 20 and 30 years. The certified group had 5 farmers, of which 3 were women. Years of experience ranged from 15 to 25. Company management recruited the participants who were paid a modest amount for their time.

### **Key findings:**

- Though data is limited, farmers from the certified group appeared to have more contact with a network of neighbors.
- Both uncertified and certified farmers mentioned soil fertility, pruning and good seedlings as best practices, however uncertified farmers also stressed replanting and irrigation while certified farmers stressed labor.
- Certified farmers mentioned bad company policy regarding coffee prices paid and length of land tenure as disincentives, as well as responsible for low income. They also cited low yields due to old trees as keeping incomes low. They identified more support from government (and changes to company policy) as part of the solution. (Later company interviews revealed that the company is awaiting government approval to replant aged coffee plots, some with more coffee, but others with other crops. This could explain the farmers citing government support as needed).
- Certified farmers had a much more complex view of environmental issues. The certified farmers were pleased that they used almost no pesticides, noting their observation that reduced pesticides lead to reduced incidences of pests. Uncertified farmers did not perceive any water shortage issues.
- Certified farmers had a positive view of certification, mentioning many benefits including more efficient water use from using meteorological information, more efficient systems and lower water use processing equipment; better market access, better prices, and reputation making their coffee more competitive; better waste management and waste water treatment from wet processing facility; provision of protective clothing & equipment; and medical checks. The uncertified group cited cost of audits as the sole reason for not being certified.