Coffee Production in Tanzania: 2009-2010 COSA Survey

Final Report

Prepared with the support of

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs FDEA
State Secretariat for Economic Affairs SECO

Title: Coffee Production in Tanzania: 2009-2010 COSA Survey

Authors: Dr. Jason Potts, Mica Bennett, Daniele Giovannucci, Christopher Wunderlich, for the Committee on Sustainability Assessment (COSA)

Analysts: ICRAF World Agroforestry Centre's Dr. Dagmar Mithöfer and Dr. Anja Gassner with Judith Sinja, Charles Masson and Eddah Nangole

Training and data team: Angelo Zago, Udo Höggel; Prisca Vythelingum; Jaclyn Daitchman; and Bernie Hewett.

Date: June 23, 2011

Research period covered: Jan-Dec 2009 – Jan- Dec 2010

Measure and Conversion Notes for the General Reader:
The Tanzanian Shilling (TZS) is the currency and during the research period, in 2009, the currency averaged 1308 Tanzanian Shillings to 1 US Dollar and in 2010 the exchange averaged 1419.
The term "Target" is used to denote the targeted entities that were assessed while "control" is used for those entities selected for comparison purposes and to help address the counterfactual questions.

Acknowledgements
This report and the full-scale initial testing of COSA in Tanzania is the product of direct support from The Swiss State Secretariat for Economic Affairs (SECO), particularly the Trade and Clean Technology Cooperation Department.

This report benefits from the helpful comments of the SECO team under the leadership of Hans-Peter Egler and those of some important stakeholders convened at two workshops on May 24 and 25, 2011 in Berne Switzerland.

COSA is part of the Sustainable Commodity Initiative (SCI), a program of the United Nations Conference on Trade and Development (UNCTAD) and the International Institute for Sustainable Development (IISD).

The Committee on Sustainability Assessment: www.theCOSA.org

Table of Contents

1. Executive summary 1
2. Background of this Document 2
3. Introduction: Coffee Production in Tanzania 3
4. Key Findings in Tanzania 1
   - Core farm and farmer statistics 1
   - Economic 1
   - Social 9
   - Environment 14
5. Lessons and Next steps 19
6. Appendix of Methodological and Field notes 21

1. Executive summary

This SECO-funded project is the very first national-level application of the COSA systems designed to help improve the understanding and effectiveness of any sustainability effort. In 2009 and in 2010 field visits were carried out on more than 1050 coffee farms in Tanzania using newly developed COSA tools. The Committee on Sustainability Assessment's (COSA) is a unique process for measuring the field level impacts of sustainability initiatives including any standards. One of COSA's defining elements is its indicatory framework and methodology which, in addition to drawing from major international treaties instruments related to sustainable development, has undergone an intensive peer review and vetting process prior to this broad field test. The results are motivating and, in some cases at least, somewhat unexpected.

Economic impacts represent some of the most challenging and important indicators for producers and policymakers alike. Certified coffee producers in Tanzania tend to have higher levels of net incomes due in part to better productivity and cost-management. This is certainly the case when cash costs are accounted for. As in many situations, accounting for the opportunity costs of labor (unpaid work) reduces actual incomes significantly.

At the Social level, fewer distinctions are evident between certified producers and their controls. One of the most important ones is the development of social capital in the form of significantly more investment in training among certified producers. Certified farms are systematically getting more training than uncertified farms—twice as much as control groups. That training may correlate to the economic improvements and perhaps also to some social benefits such as restrictions on agrochemical application by vulnerable groups but training does not appear to have made significant differences in some of the key social indicators. For example, on indicators such as protective gear for agrochemical application, certified farms do not appear to be significantly better off.

At the Environmental level, the effects of certification are not wholly convincing among many of the Tanzania producers sampled. Data suggests, for example, that certified standards are not having a significant impact on improving aspects such as soil erosion or recycling practices. If such aspects are deemed to be a priority for improving farm sustainability, then one may conclude that greater focus on training and compliance efforts may be necessary.

As with any trade or economic analysis, findings must be tempered with the understanding that two data observations, conducted a year apart can certainly be informative but are not necessarily representative of a clear and definitive trend. Another of the important observations arising from the data analysis is that the variability of performance is very significantly due to the conditions of the region of production. In other words, the control groups are vital for any effective comparisons.

Certifications in Tanzania tend to offer some important benefits to producers and are valuable to them. These benefits do not, however, appear to be as broad ranging as might be expected since many social and ecological indicators do not show an advantage for certified farmers. Lessons could be drawn for standards bodies and development agencies about how to improve the outcomes of certification regimes.

2. Background of this Document

As sustainability initiatives expand in mainstream markets and with the world's largest food and beverage companies, they are creating a new model for sustainable production and trade. Yet, it is not clear if, or the extent to which, they improve livelihoods, environment and socio-economic conditions of the participating growers. The nature and distribution of those impacts remains mostly unknown and the data that does exist on the impacts of such initiatives tends to be piecemeal or anecdotal, leaving the major questions of overall sustainability, global effect and attribution unanswered.

This absence of a more expansive and rigorous information base is leaving policy makers, consumers, supply chain decision-makers and, worst of all, producers themselves, increasingly challenged as they attempt to determine when and where investment in such initiatives is warranted and where it is not. Decisions to help ensure long-term sustainability can only be as robust as the information they are based on. As such, SECO support in Tanzania for The Committee on Sustainability Assessment's (COSA) initial work to develop the data collection system there helps ensure that sustainability efforts are as effective as possible.

This SECO-funded Tanzania Project was selected for COSA's first in-depth application of its methodology in Africa. It presents many of the challenges of development work: limited institutional capacity, poor producers and marginal infrastructure. The results presented in this report are derived from field visits carried out in 2009 and in 2010 on approximately 1050 farms. COSA uses randomized trial sampling methods and to address the counterfactual possibility that certification-related results could have occurred anyway without certification, matches control groups for the main variables: farm size, agro-ecological zone, asset levels, and distance to market. The method of selecting target or treatment farmers and appropriate controls in Tanzania is explained in the Appendix.

It is probable that no single report could do justice to the great deal of data gathered and there will be more reporting and analysis that will be conducted in the near future and shared with SECO. It is important to note that sustainability certifications are largely a process and that impacts related to it can therefore be expected to occur at different stages of the process. Improvements made as a result of lessons learned in year one (Y1) mean that the data set is slightly different and more robust in year two (Y2). Two years is the absolute minimum time to have some idea of what may be happening in terms of costs and benefits of certifications. The following analysis provides a window to the potential of the COSA data to inspire thoughtful and informed discussion for useful policy and business decisions.

3. Introduction: Coffee Production in Tanzania

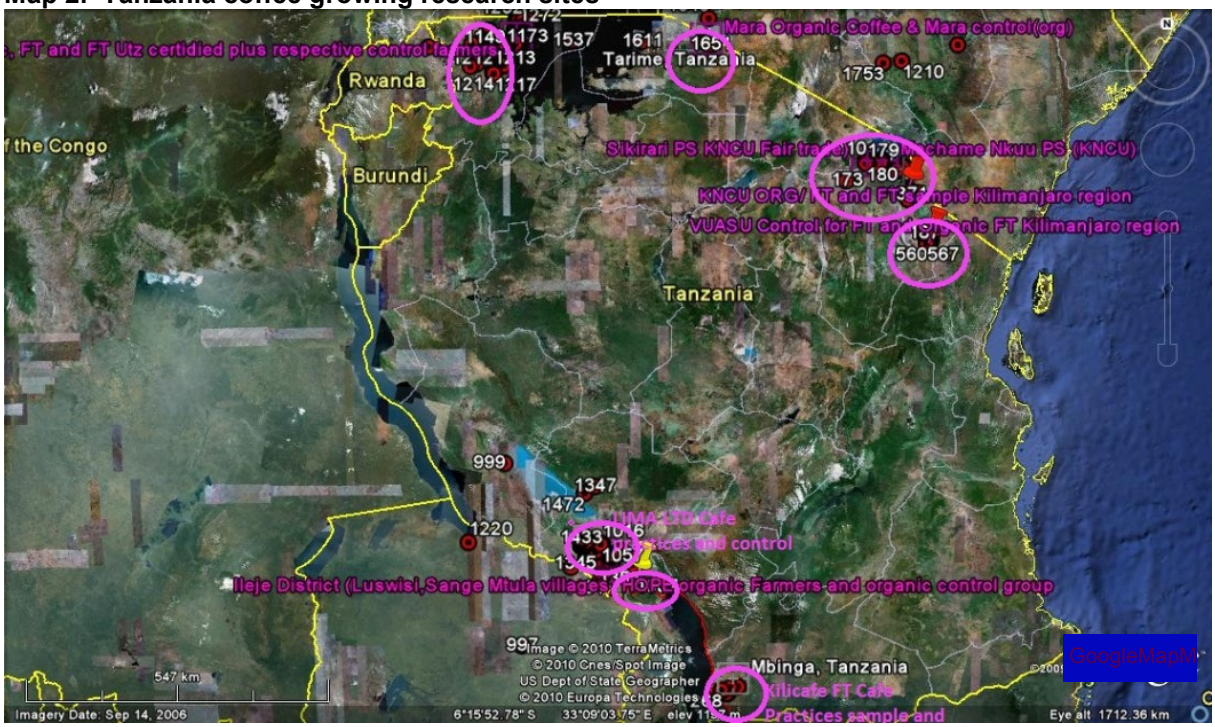
Tanzania was selected as a target country to develop and implement COSA due to the considerable importance of coffee for the economy and for poverty alleviation. Globally, it is the 19th largest producer of coffee, with nearly sixty thousand tons of coffee for the 2010-2011 harvest (International Coffee Organization data). Average production is around 250 kg green (clean) coffee per hectare. Approximately 425,000 households in Tanzania (more than 2 million people) derive part, and sometimes all, of their income from coffee. At least 95% of the annual production in Tanzania originates from these smallholder farms. In addition, an estimated 2 million more people are employed directly or indirectly by the coffee industry.

Tanzania is a Least Developed Country (LDC), a heavily indebted poor country (HIPC) and is ranked 140th out of 162 countries in the UNDP Human Development Report (2008/09, with a mean per capita income of US$ 1,500 (2010 est. at PPP). Agriculture accounts for 42% of total GDP (2010) and 80% of employment for the labor force of 22 million people. Life expectancy at birth is 56 years and adult literacy is at 73% of the population. Approximately 50% of Tanzania's almost forty million inhabitants live on less than one dollar a day. The majority of smallholder coffee farmers are defined as poor.

Map 1. Tanzania political view

Tanzania is a relatively large country of 945,087 square kilometers. It has a diverse terrain, with a mountainous area in the northeast, where the famous Kilimanjaro coffee is grown, the great lakes of Lake Victoria and Lake Tanganyika to the North and West, a large plateau central area with plains and arable land, and a dry, hot eastern coast. Coffee production is spread across the country, but concentrated in five main geographic zones, in the north (Kilimanjaro, Arusha &Tarime), in the west (Kigoma & Kagera) and in the south (Mbeya Iringa and Ruvuma). Travel between these areas can be relatively slow and difficult given the size of the country and the often limited infrastructure. Altitude, rainfall and soils (including rich volcanic soils in the north) are very conducive to the production of high-quality Arabic and Robusta coffees.

Map 2. Tanzania coffee growing research sites



Tanzania's national coffee strategy identifies the following key constraints for the sector: stagnant export volumes, low productivity, poor agricultural practices and lack of access to credit. Also Coffee Wilt Disease, Coffee Berry disease, and Coffee Leaf Rust have become serious threats.

However, despite a prevailing trend of declining productivity and quality, coffee still makes an important contribution to smallholder livelihoods. There is a considerable potential, notes the national coffee strategy, to significantly improve livelihoods by increasing farm productivity, improving quality, and accessing premium markets.

Most significant of the coffee sector reforms in recent years, was allowing direct exports by relaxing the legal requirement to sell all coffee through the state auction. This measure opened the way for differentiated coffees and enables small-scale groups to produce coffees that better responded to market demands and may be stimulating quality improvements, price premiums, and direct market links.

Fairtrade and Organic programs have operated in the country for several decades. More recently Utz Certified, Rainforest Alliance and Starbuck's CAFE Practices have expanded activities. This has also led to many dual or multiple certifications. After the start of the COSA project, the 4Cs Association completed verification of producers in Tanzania; however it was too late to include them in the field surveys.

4. Key Findings in Tanzania

Core farm and farmer statistics

This draft report presents key economic variables in Tanzanian Shillings per hectare to allow local comparisons. Final data will be converted to USD/hectare for international comparison.

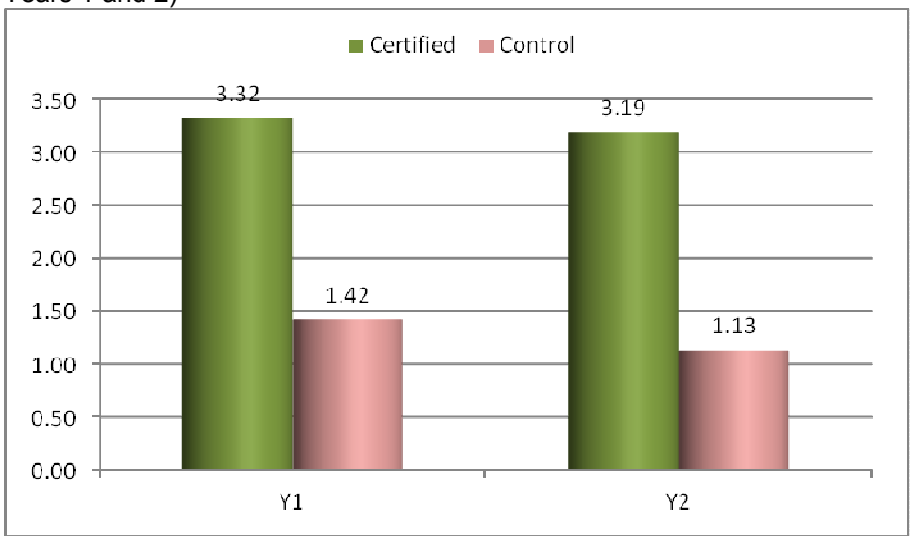
Table 1. Basic Statistics for Tanzanian sample group

Variable	Measure
Size of Household	5.03 persons
Average Farm Size	3.65 acres - 1.48 hectare
Average Crop Area for Coffee	2 acres - 0.81 hectare
Average # of Years Growing Coffee	32 yrs

Economic

Economic impacts represent some of the most challenging and important indicators for producers and policymakers alike. Improving capacity to perform often requires technical training and investment. The coffee certification systems have some of the most developed training services and networks and this is reflected in the clear and definitive rates of training among certified farms as compared to their controls. Certified farms are systematically getting more training than uncertified farms—more than twice as much than control groups on average over both years surveyed: Y1 and Y2

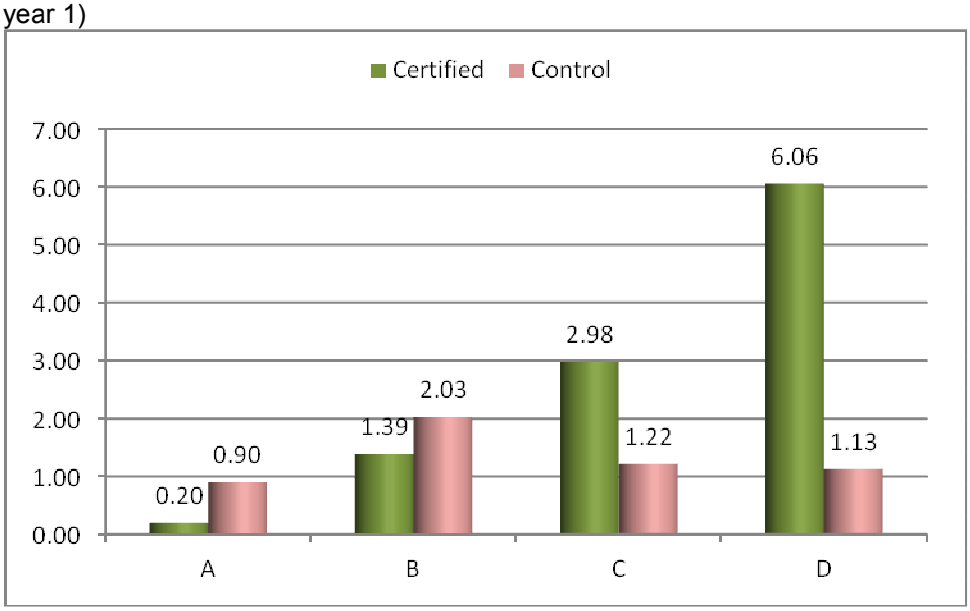
Figure 1: Average hours of training received in the last production year (certified vs. control, Years 1 and 2)



The certified farms A were the one exception, receiving consistently less training than their uncertified control. B certified farms, on the other hand, experienced less training in year 1 but showed significant increase by Y2. D farms stand out as having received significantly higher amounts of training than all other groups and between 400% and 700% more training that their control group. Considering the

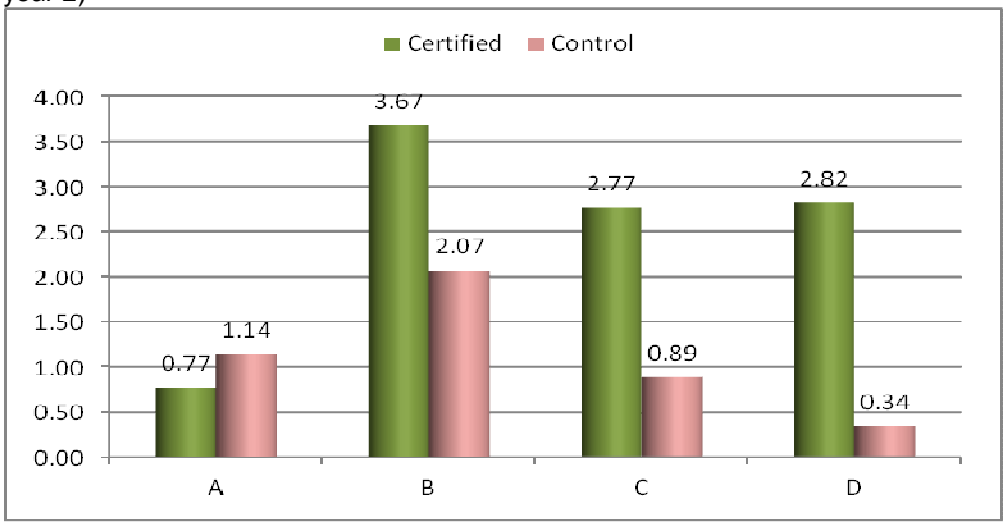
high levels of training being delivered to group D, and the relatively low levels of current income may suggest that this group could be in a position to achieve performance improvements in coming years.

Figure 2: Training hours per farm in last production year for Y1 (certified vs. control by group, year 1)



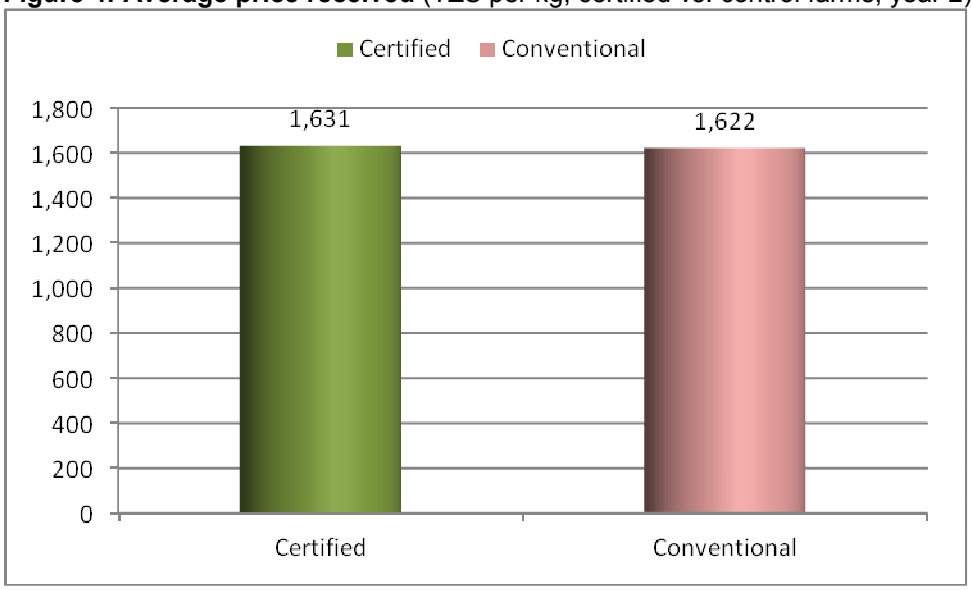
High levels of organization in Tanzania can mean that there are demonstration effects whereby groups nearby certified farms learn improved production practices that give them access to quality premiums (even in the absence of certification per se).

Figure 3: Training hours per farm in last production year for Y2 (certified vs. control by group, year 2)



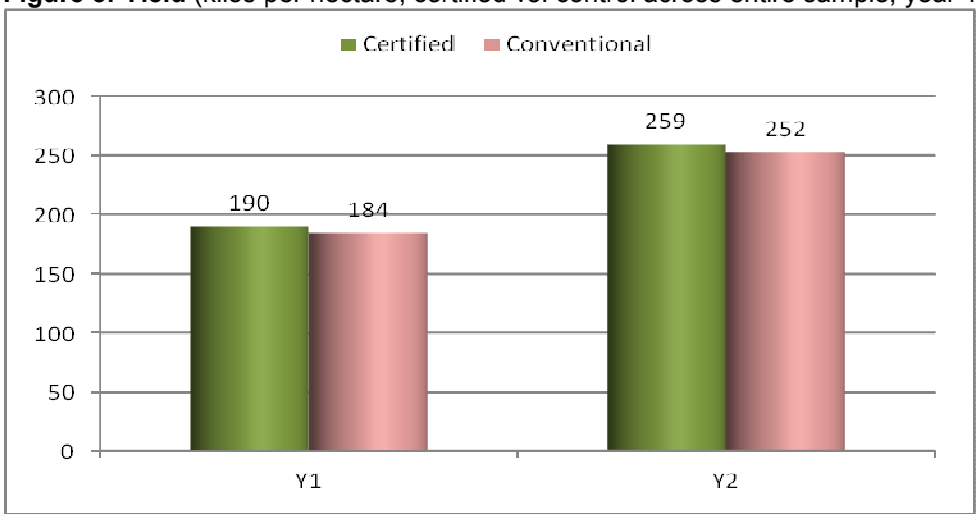
Prices paid for certified coffee, on average, are generally similar to those paid for comparable conventional coffees. There are differences among the individual groups. Higher prices for conventional coffees in year 2 generally reflect higher world market prices over the second year. Premiums for certified coffees are expected to decline as overall international prices for conventional coffees increase.

Figure 4: Average price received (TZS per kg, certified vs. control farms, year 2)



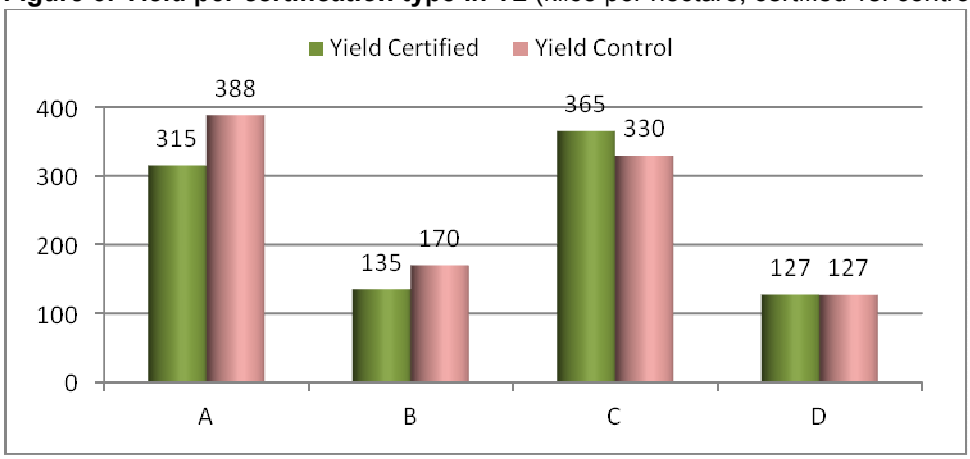
For yields certified farms are doing slightly better than uncertified farms on average, but by a modest factor of only 2-3 percent suggesting functional equality between certified and control farms.

Figure 5: Yield (kilos per hectare, certified vs. control across entire sample, year 1 and 2)



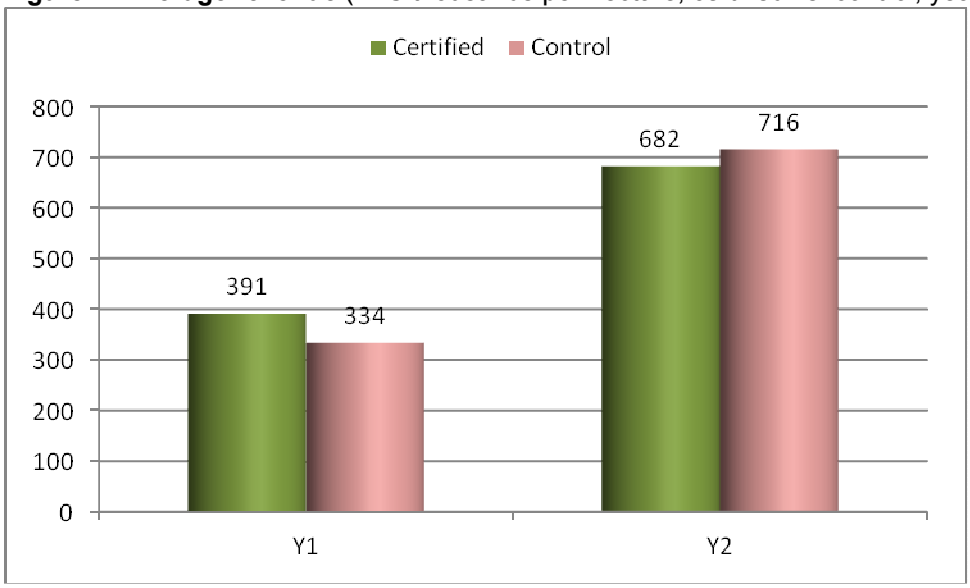
At the level of individual initiatives, differences can be significant but are not dramatic except in the case of the controls for Group A which it is understood may have undergone independent training.

Figure 6: Yield per certification type in Y2 (kilos per hectare, certified vs. control by group, year 2)



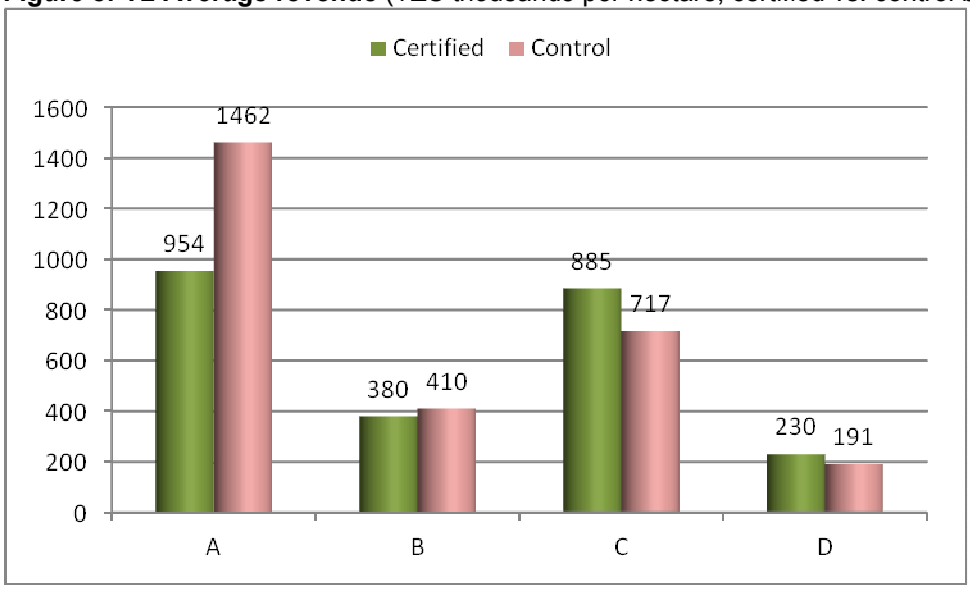
Revenues are on average 17% higher for certified production in year 1 and slightly lower than their controls (4%) in year 2. Year two was affected almost exclusively by a substantial increase in the A control group revenue.

Figure 7: Average revenue (TZS thousands per hectare, certified vs. control, year 1 and 2)



As noted in Fig 8, the certified producers in the samples for B and D are from regions with lower levels of yield and revenue. It may be that groups in poorer regions chose certification there to help them surmount their difficulties. The revenue difference for control groups in Y2 is, as noted above, mostly explained by the substantial increase in yields and price for the A group control farms.

Figure 8: Y2 Average revenue (TZS thousands per hectare, certified vs. control by group, year 2)



Costs of labor – by far the single highest cost factor - for Y1 were calculated only as actual paid labor without the opportunity costs of that labor (Fig 9). In Year 2, experience suggests that this undervalues the real costs embedded in the production and so the opportunity cost of unpaid labor is added at the same rates as the work would be paid in each area.

Figure 9: Average cost of labor Y1 – Paid Only (TZS thousand per ha. for certified vs. control by group, yr 1)

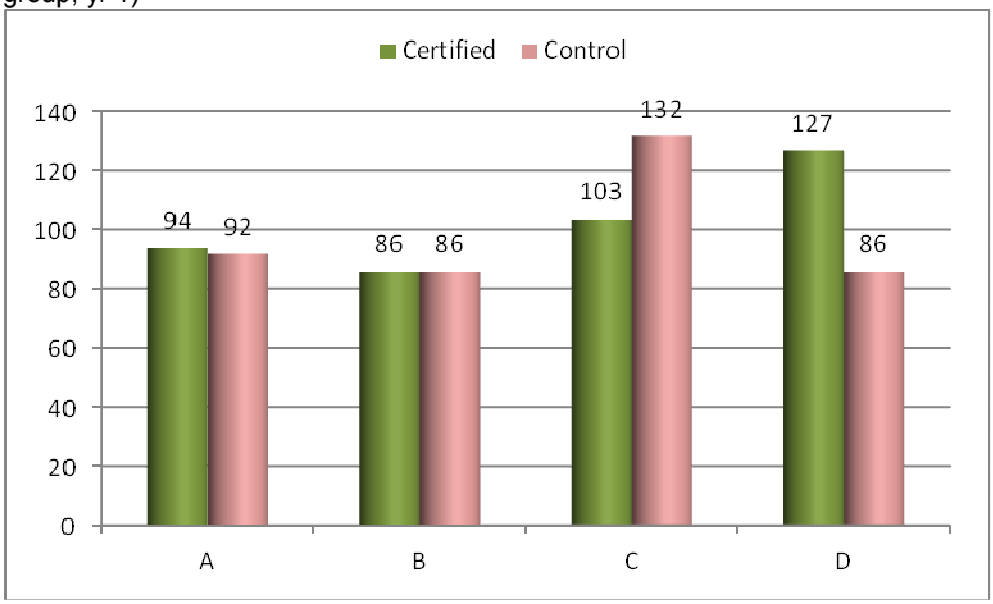
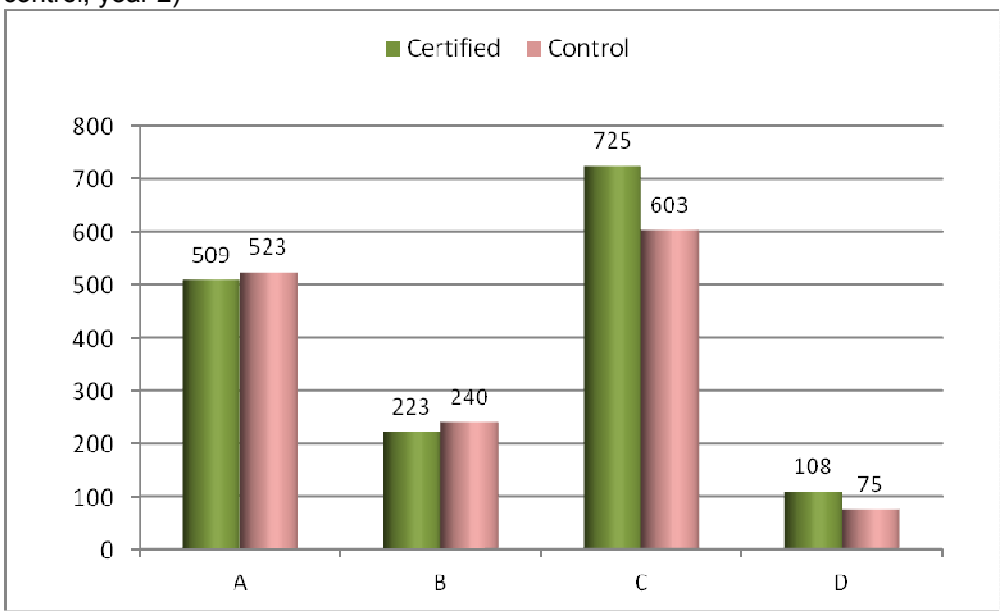


Figure 10: Average cost labor Y2 Paid and Unpaid (TZS thousands per hectare, certified vs. control, year 2)



Overall, average net income is higher for Y2 but there is considerable variance between the groups. Part of the difference is explained by higher yields.

Figure 11: Average income Y1 (TZS thousands per hectare, certified vs. control, year 1)

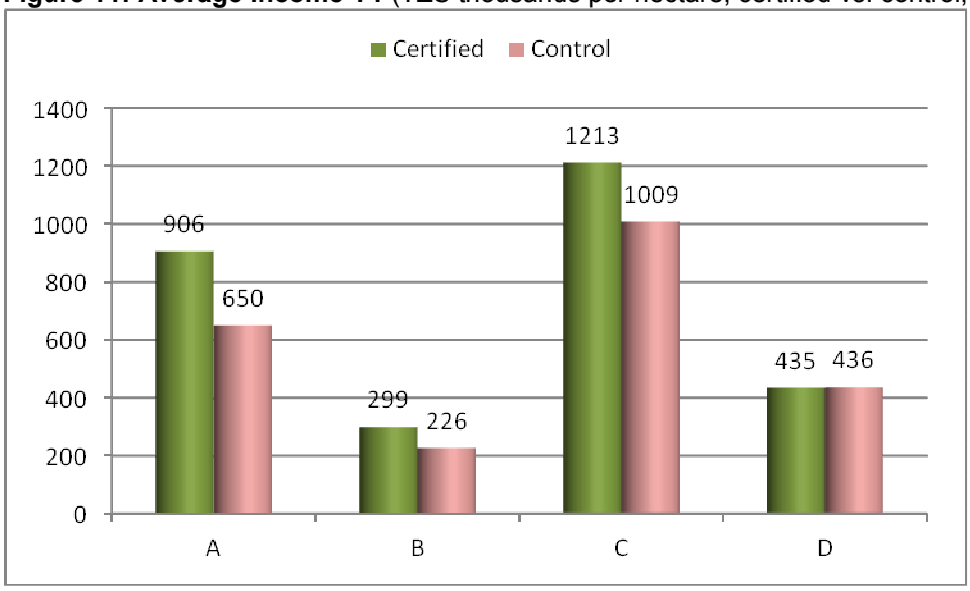
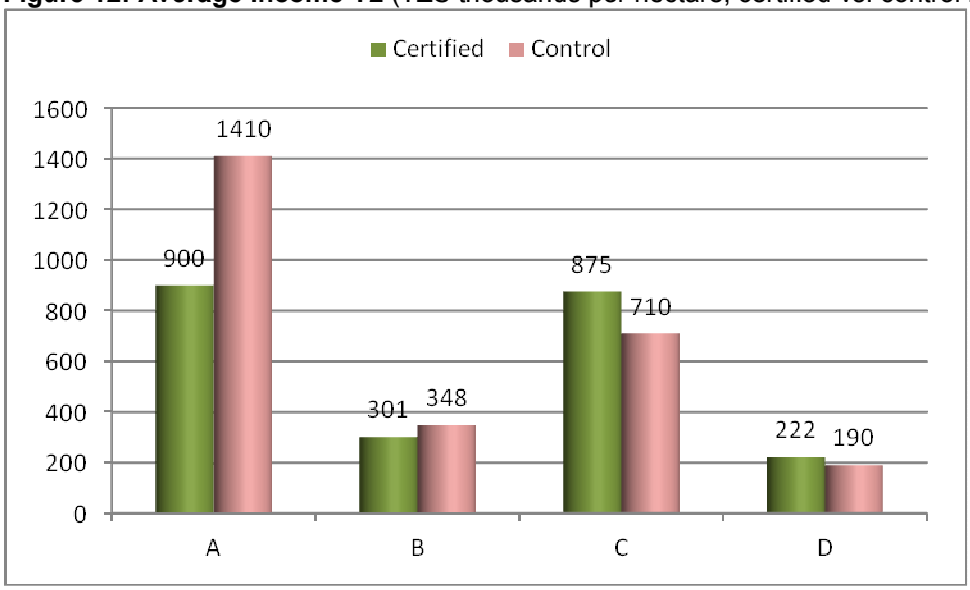
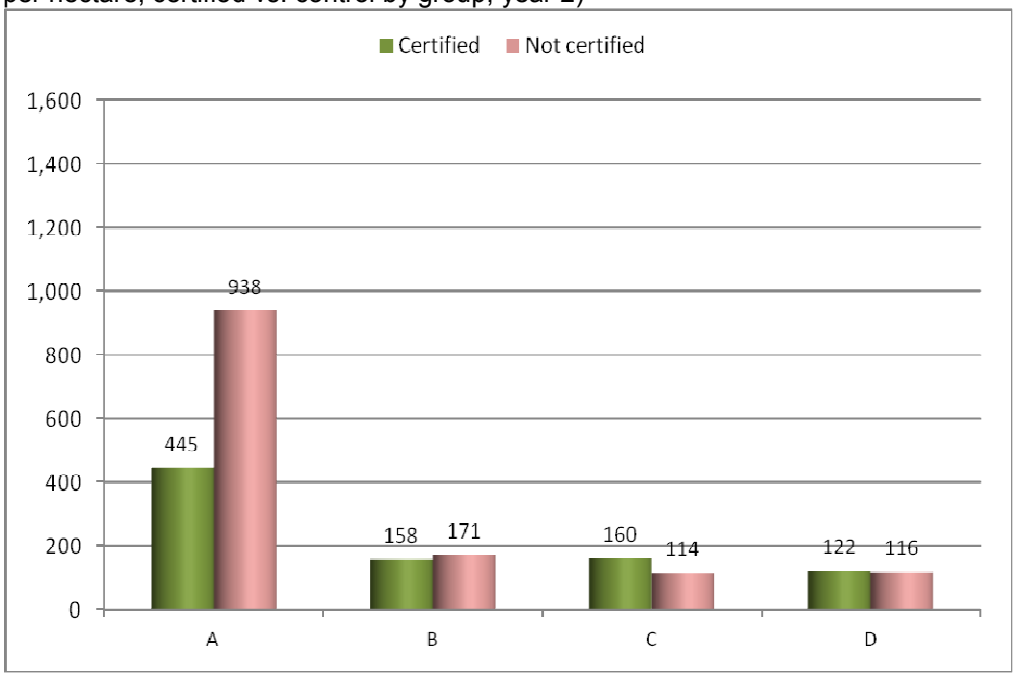


Figure 12: Average income Y2 (TZS thousands per hectare, certified vs. control by group, year 2)



The Figure below shows the reality of the coffee producers if one accounts for their own family labor as a cost. The results are significantly more modest.

Figure 12.1: Average income Y2 reflecting value of paid and household labor (TZS thousands per hectare, certified vs. control by group, year 2)



It appears that the Economic Perception of farmers is more optimistic about their future after an additional year in certification. In addition to COSA's gathering economic of data, farmers were asked to give a personal assessment of the change in their economic situation compared with the year

before. Data over year 1 and year 2 shows a positive and growing perception of improved economic situation across certified farms.

Figure 13: Percentage of farms reporting somewhat or much improved economic situation over the prior production year (average across all certified farms in sample).

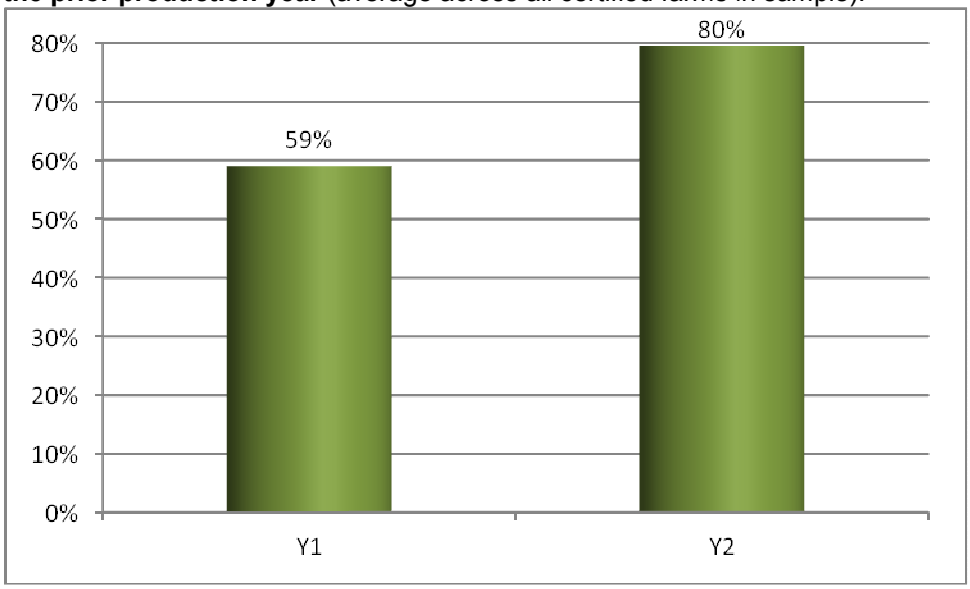
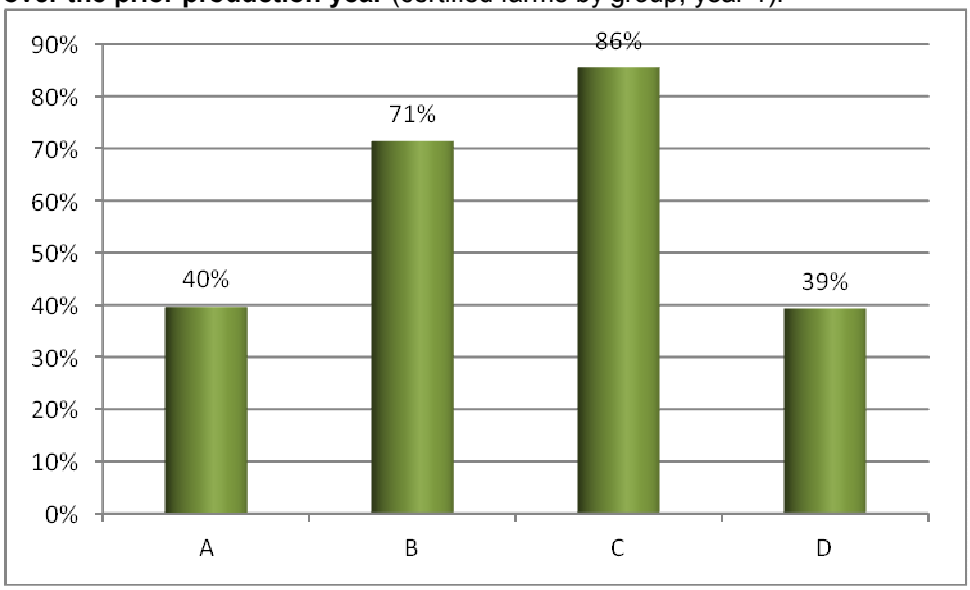
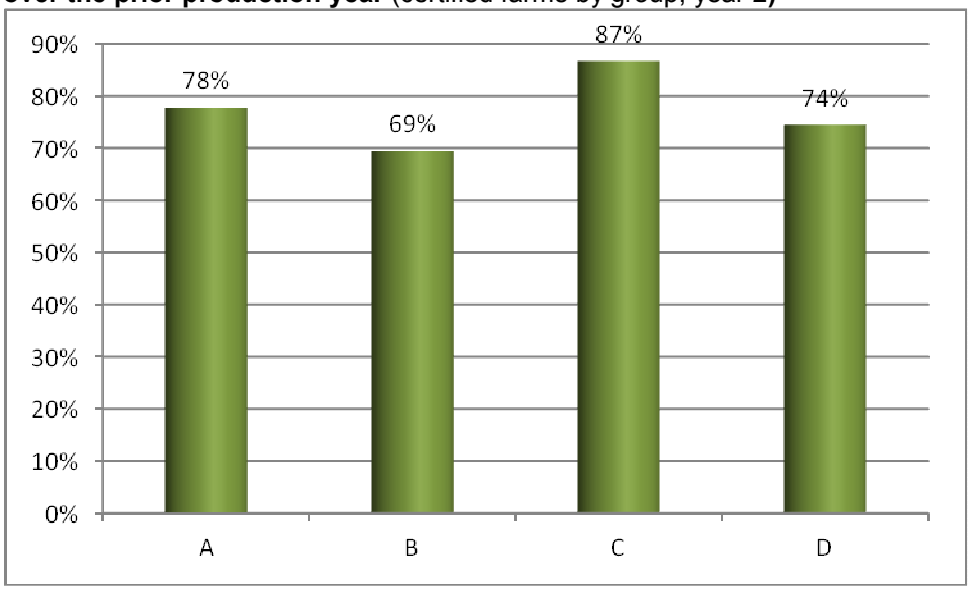


Figure 14: Y1 Percentage of farms reporting somewhat or much improved economic situation over the prior production year (certified farms by group, year 1).



The degree of confidence and interest in the processes that producers demonstrate can be an important factor in their willingness to implement sustainable practices and even to become certified sustainable suppliers.

Figure 15: Y2 Percentage of farms reporting somewhat or much improved economic situation over the prior production year (certified farms by group, year 2**)**



Social

Producer social well being is often connected to economic well being. The COSA social indicators derive from standards on basic rights, health and safety, and education. For large, estate farms, these indicators would typically be measured among workers. For situations like Tanzania's family-run smallholdings, we collect data on these indicators from the farmers themselves to measure the social benefits that sustainability initiatives have facilitated or not. The following provides insight on a basket of social measures including access to medical care, clean water, decent living conditions, self-governance and community well being. Satisfaction and social well being is expected to be a predictor of the acceptance and long term success of an initiative among farming communities.

Education levels provide an indication of both current poverty levels as well as opportunities for improved livelihoods for future generations. In Y1 we asked farmers whether all children were in school (% of farms saying that all children go to school). We learned that responses to this question were high but that many children appeared to be a lower grade levels than appropriate for their age. For year 2, the survey question was revised to record the grade levels and ages of all children in the household to determine the percentage of children at the appropriate age-grade level. The new data gives a more detailed picture of the level of vulnerability that families and children face. The significant presence of children going to school at lower grades than expected for their age indicates significant poverty across the areas observed.

Figure 16: Percentage of farms reporting that all children are in school Y1 (certified vs. control mean across entire sample, year 1)

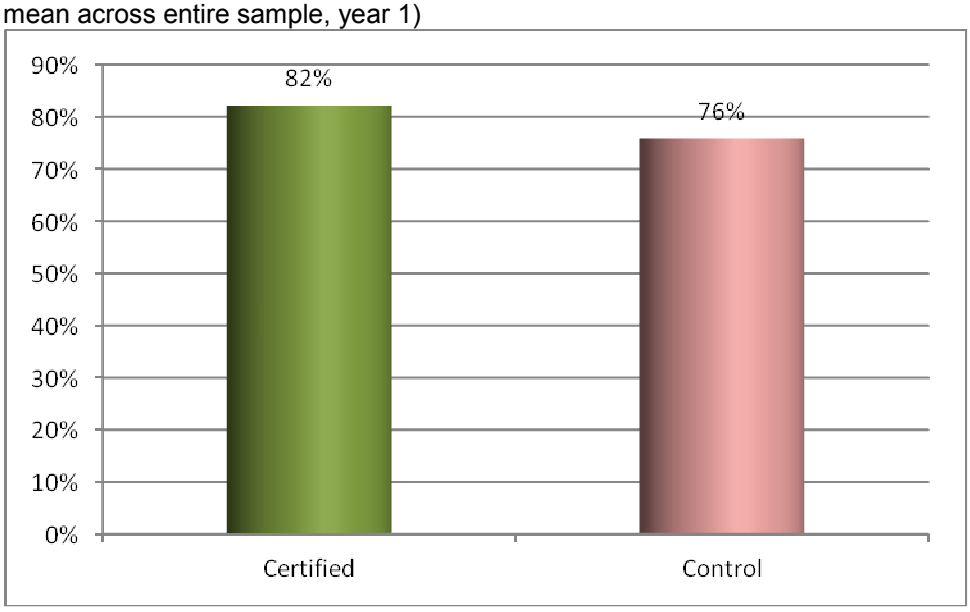
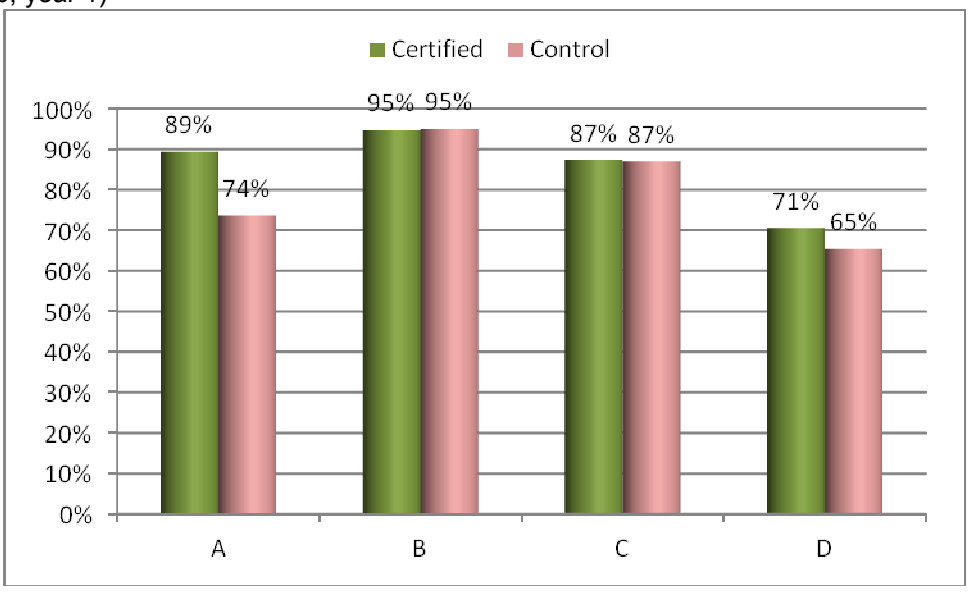
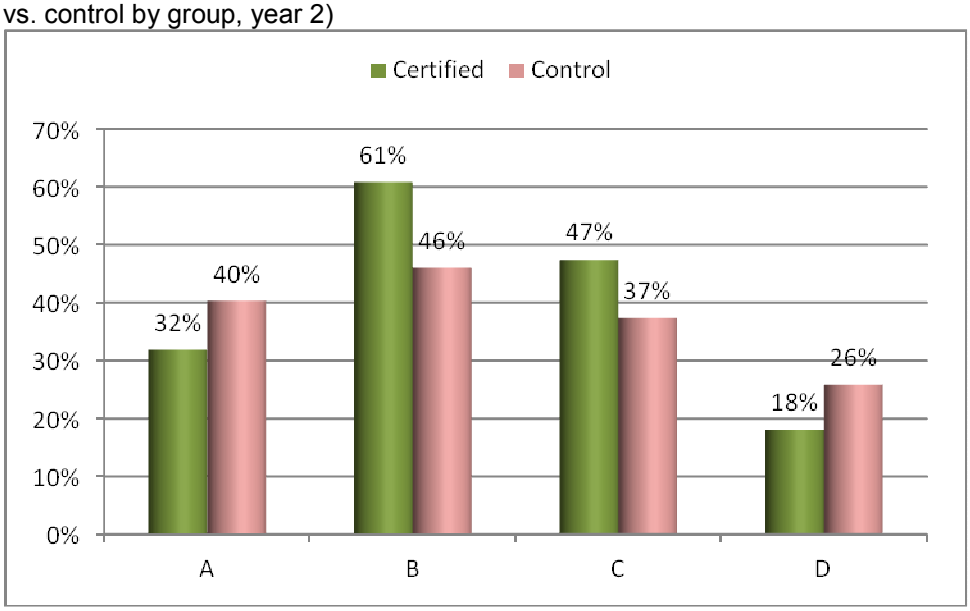


Figure 17: Percentage of farms reporting that all children attending school (certified vs. control by group, year 1)



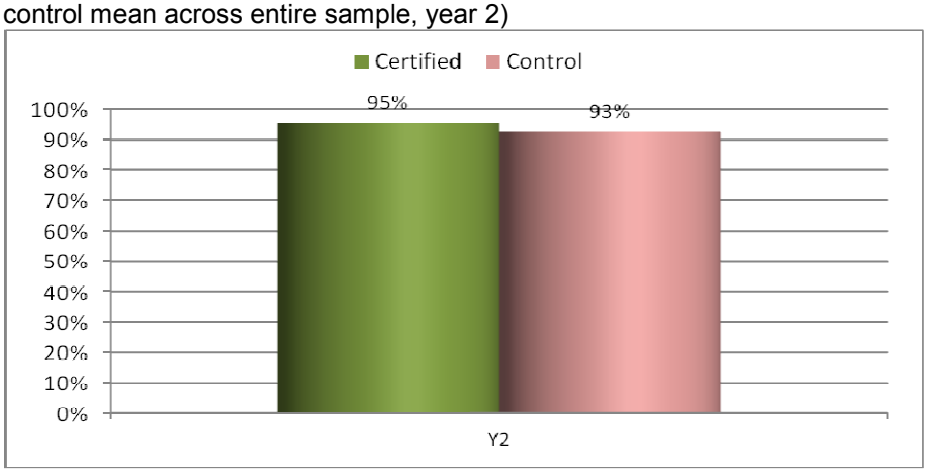
While certification may have a modest correlation to more children going to school, it does not have such consistent correlation to ensuring they are at the expected grade for their age. Although it is difficult to assess conclusively with only a single year of readings, B and C certified farms did have notably higher percentages of children at the appropriate school levels.

Figure 18: Percentage of children at the appropriate level of schooling for their age Y2 (certified vs. control by group, year 2)



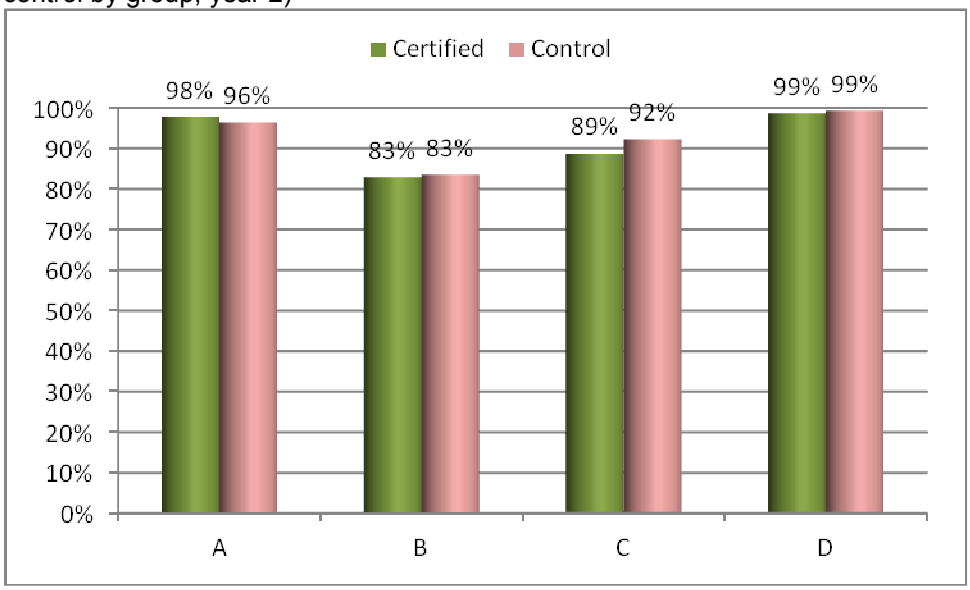
In the area of Food Security most of the farms don't face significant problems. Although certified farms score slightly better, the difference is in no way consistent across groups and is within a margin of error suggesting little to no systemic correlation between days of hunger and certification.

Figure 19: Y2 farms reporting no days without sufficient food over the last year (certified vs. control mean across entire sample, year 2)



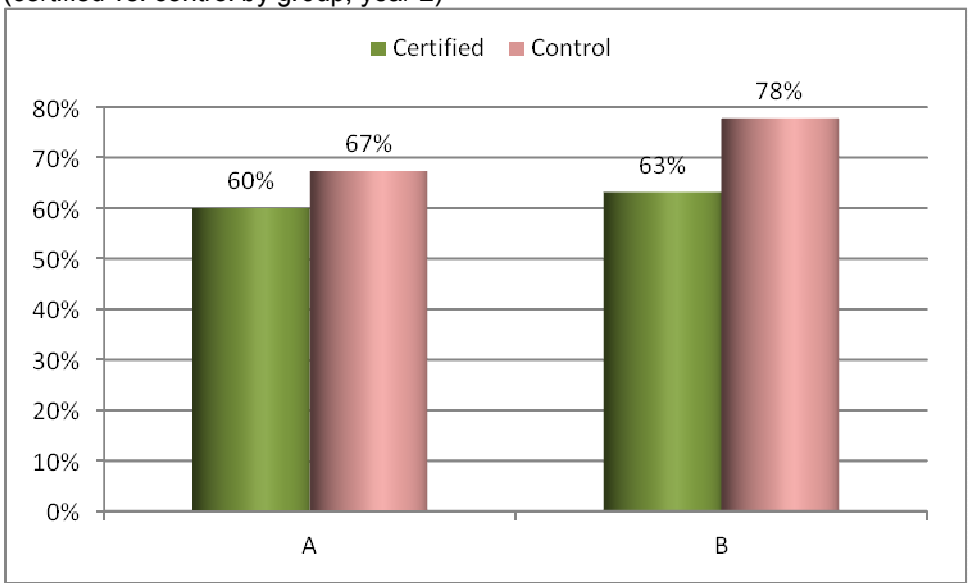
As evidenced below, certifications B and C did not perform as well on these measures as the other two groups. There are no readily evident reasons for the differences.

Figure 20: Y2 farms reporting no days without sufficient food over the last year (certified vs. control by group, year 2)



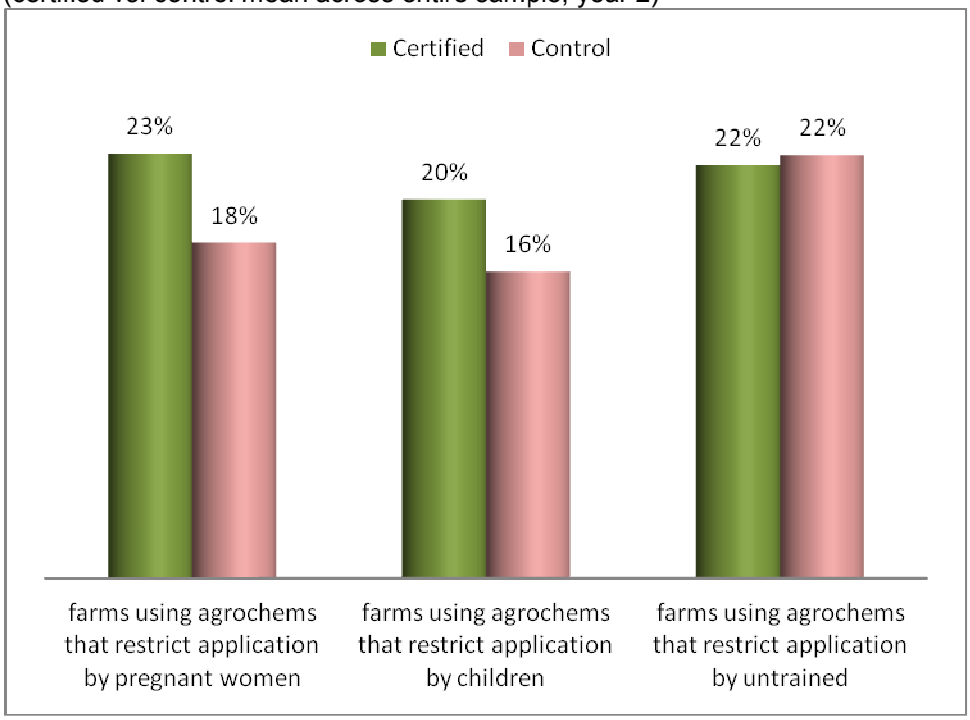
In measuring the availability of Protective Gear on farms that apply agrochemicals, the question was refined for year two and probably better captures the actual situation at the farm level. The conclusion is that certified farms do not do as well to provide at least the most basic level of protective gear. This is a rather surprising finding and one that, due to its consistency in the data, would appear to be fairly robust.

Figure 21: Farms applying agrochemicals with more than one piece of protective gear Y2 (certified vs. control by group, year 2)



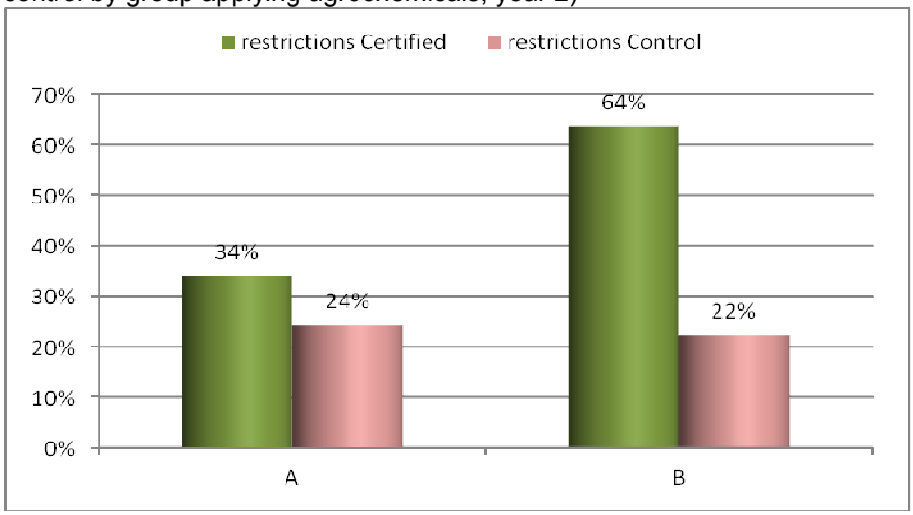
Policies Restricting Agrochemical application for vulnerable or untrained persons exist on certified farms only slightly more often that on control farms.

Figure 22: Farms with restrictions on agrochemical application by vulnerable groups Y2 (certified vs. control mean across entire sample, year 2)



The difference between the rates of certified and control farms restricting the application of agrochemicals by vulnerable groups is more pronounced among those groups that have fewer controls on agrochemicals suggesting possibly that training could be having an impact on practices.

Figure 23: A & B farms with reported restrictions on agrochemical application Y2 (certified vs. control by group applying agrochemicals, year 2)



Environment

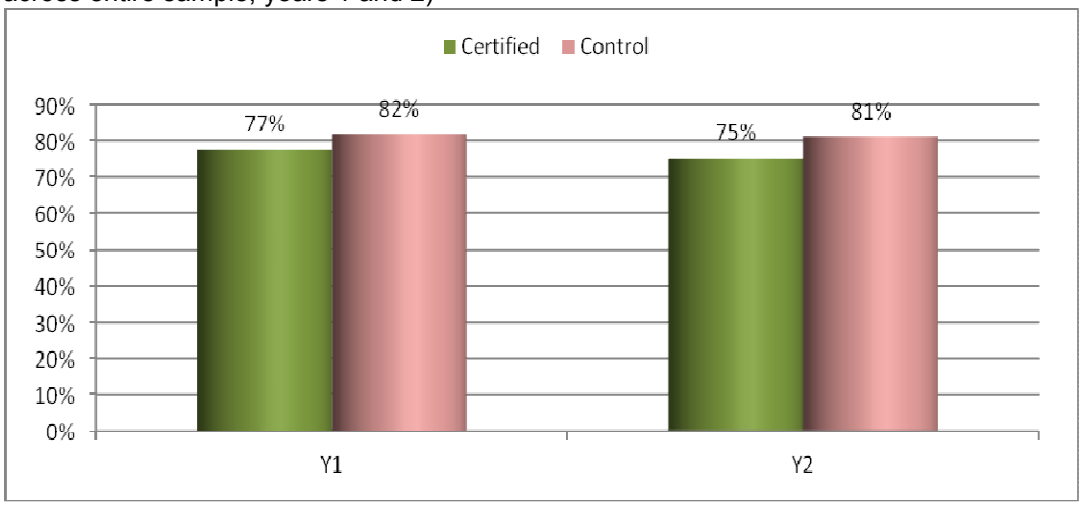
Environmental sustainability is a critical element of smallholder farming culture both due to its impact on long term productivity, and also due to its direct impact on the livelihoods of farmers themselves. Small farmers tend to have fewer options and are more critically dependent on the quality of their environment.

One of the major challenges facing farm level environmental sustainability arises through the use of modern or "technified" methods without appropriate training, precision or rationalization. Certification has the potential to bring an awareness and understanding of those technified methods that have the potential to simultaneously lead to increased yields and less environmental damage.

The COSA environmental indicator categories under the environmental section include: resource use; pollution; soil quality; waste management, biodiversity and carbon sequestration. Below is a summary of the highlights from select measures.

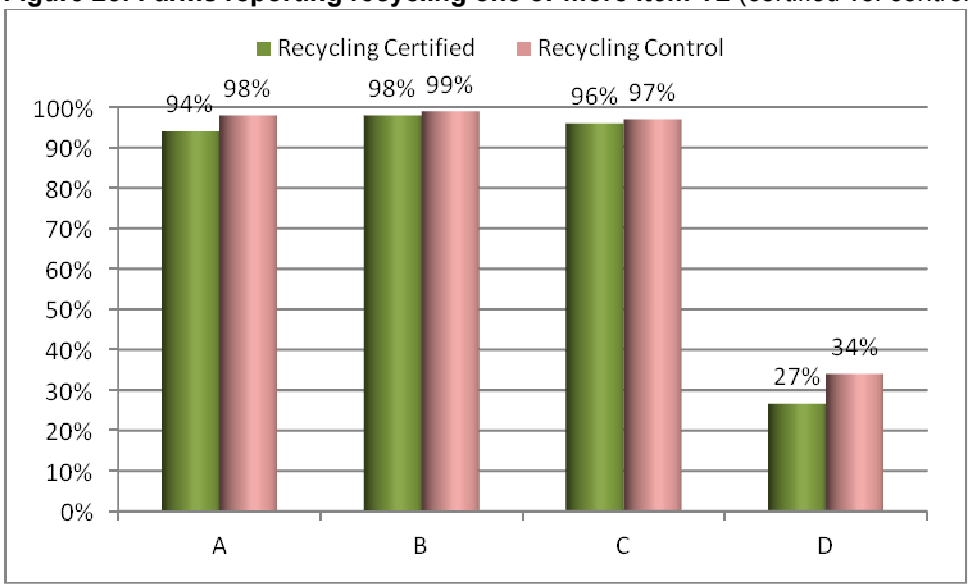
Recycling occurs in a slightly higher percentage of conventional farms but the difference is not significant and both groups do so at relatively high levels – at least ¾ or more. At the same time, the data would appear to suggest that the standards are NOT having a significant impact on improving recycling across farms. As a result, if this is deemed to be a priority for improving sustainability, it may point to a need to focus training and compliance efforts on the implementation of recycling practices. Recycling is measured for different synthetic items (e.g. plastic) as well as crop wastes and other organic matter (e.g. manure, leaf litter).

Figure 24: Percentage of farms reporting recycling one or more item (certified vs. control mean across entire sample, years 1 and 2)



Certification group D stands out for relatively low levels of recycling in this Tanzania case. This result, which is also consistent with Y1 findings, points to the importance of context in terms of regional differences or geographic location.

Figure 25: Farms reporting recycling one or more item Y2 (certified vs. control by group, year 2)



Soil Erosion was recorded as the % area with evidence of soil erosion across the entire farm in year 1. In year 2 we recorded the severity of the soil erosion present across clearly defined samples to improve accuracy. The different methods are not comparable. Taking year 2 data to be the more accurate, soil erosion doesn't arise as a major issue across either the treatment or control groups in Tanzania. Actual presence of soil erosion probably has less to do with any actual practices and more to do with the presence of sloping terrain. COSA plans on including farm-specific slope data in the future through GPS tracking as part of its technology upgrade.

In year 2 the measurement of soil erosion was done according to severity of erosion present within specified samples. Point rankings of 0-3 were provided to each sample according to a standard 4-point measure. The low average scores suggest that most of the farms were found to have no evidence of soil erosion. Nevertheless, the relative levels of soil erosion are higher for the controls than the certified farms. This result is also consistent with year 1 findings which showed 13% more farms with evidence of soil erosion than control farms.

Figure 26: Farms with visible soil erosion Y1 (certified vs. control mean across samples, yr 1).

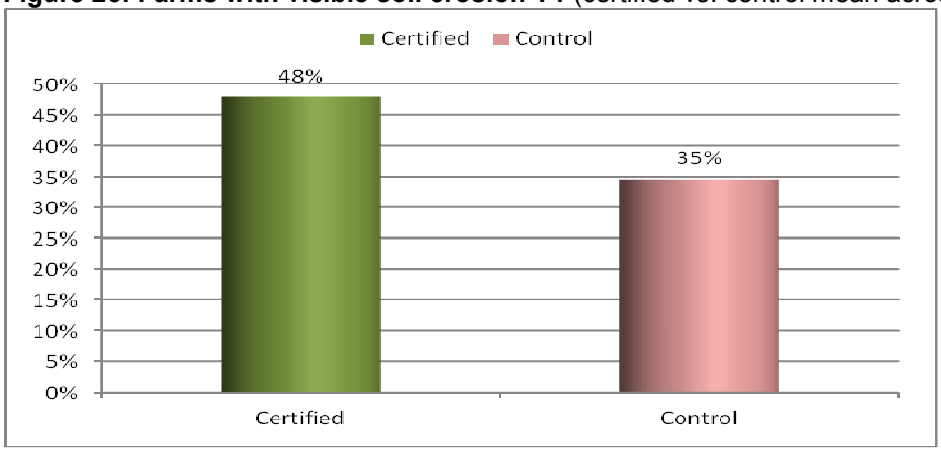
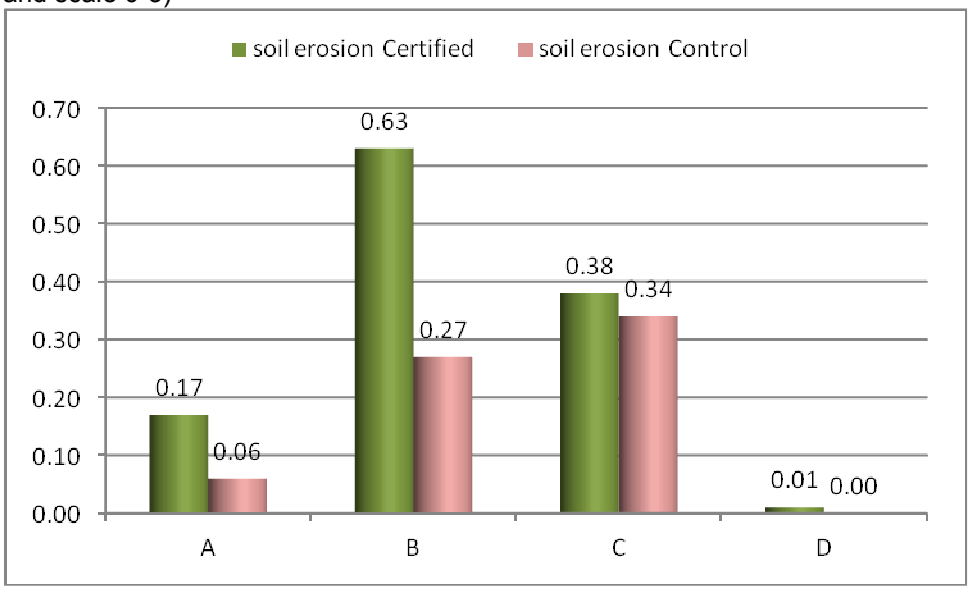
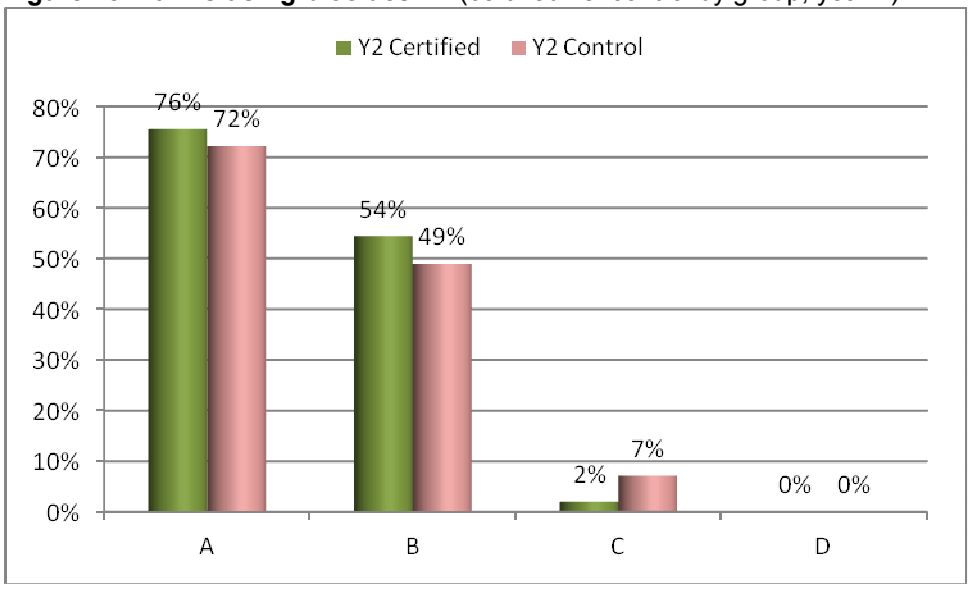


Figure 27: Degree of observed soil erosion across farm Y2 (certified vs. control by group, year 2, and scale 0-3)



The use of synthetic agro-chemicals, particularly biocides, is disputed as to whether it is a determinant of sustainability. It is, however, generally agreed that agro-chemicals should be used in a very controlled manner. Our data on the use of biocides suggests that certification is not leading to any systemic reductions or increases in their use. The rate of agro-chemical usage appears to vary more by the region in which the production is occurring rather than whether or not a group is certified. Even organic certified production shows little significant difference from its control which operates as passive non-certified organic.

Figure 28: Farms using biocides Y2 (certified vs. control by group, year 2).



The correlation between the use of biocides and yields is relevant. Both A and C farms (for both certified and controls) have consistently the highest yields over our observation period. Yet the rates of use of biocides across the groups are very different. In fact, the best yield performance across all groups over year 1 and year 2 is found in the C farms, all of which have extremely low rates of biocide use. This would appear to suggest that the C farms are among the most sustainable in terms of a biocides to yields ratio but it is worth noting that this conclusion applies almost equally to both the C controls and to the C certified farms.

Figure 29: Yield (kilos per ha) and biocide use (percentage of farms) (certified vs. control by group, year 2)

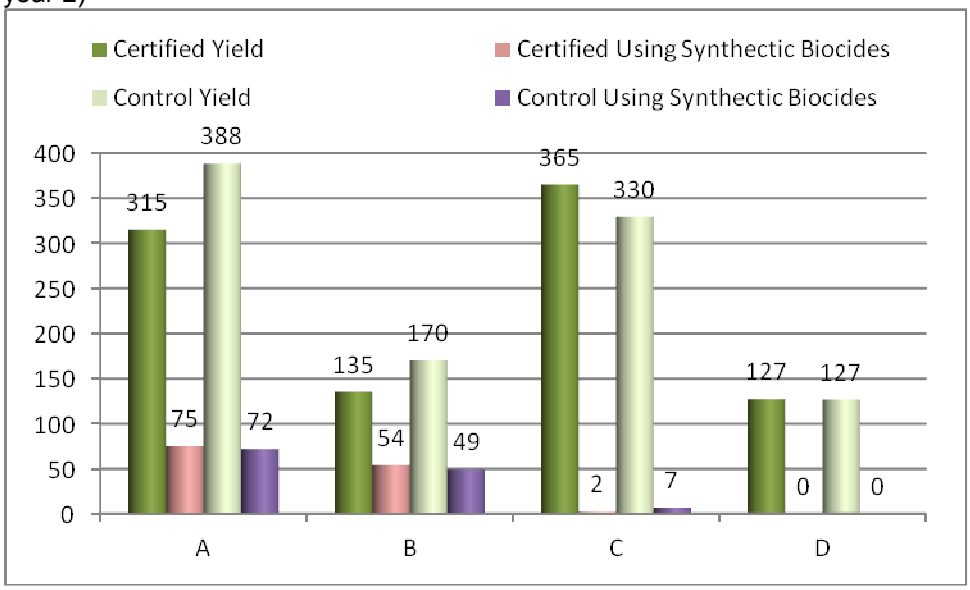


Figure 30: Farms using synthetic fertilizers Y2 (certified vs. control by group, year 2)

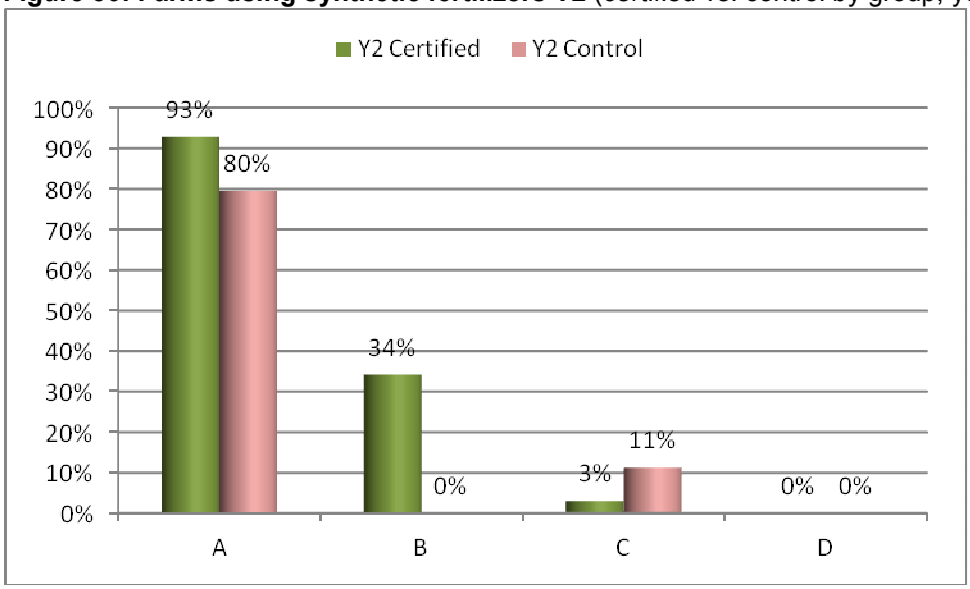
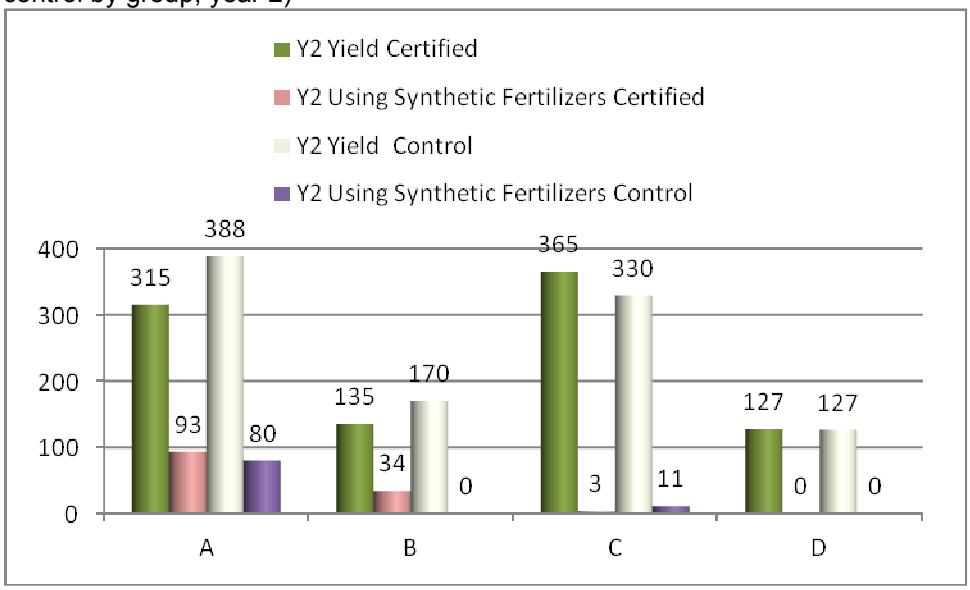
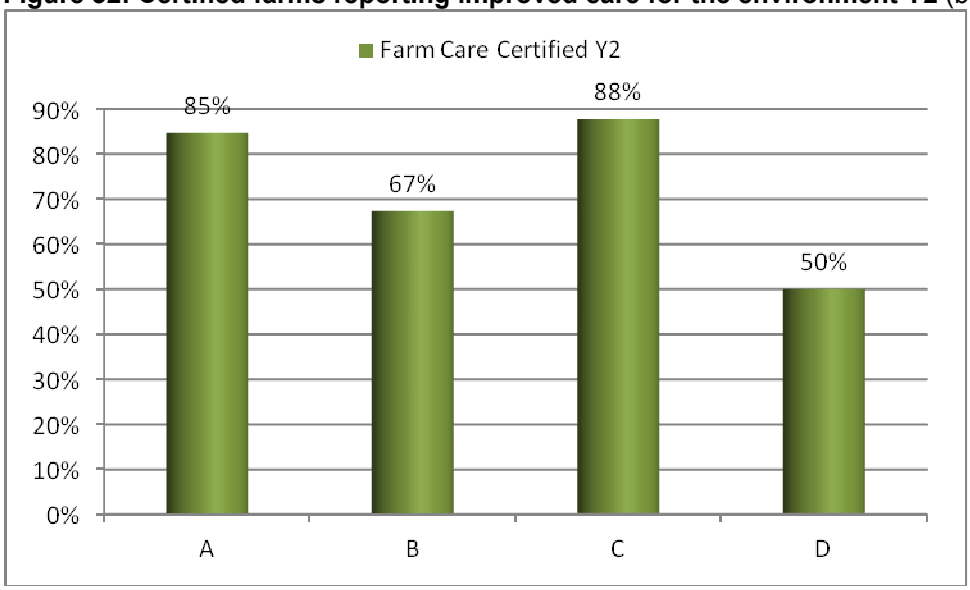


Figure 31: Yield (kilos per ha) vs. synthetic fertilizer use Y2 (percentage of farms) (certified vs. control by group, year 2)



Certified farmers perceive that they are taking better care of the environment as a result of certification and these numbers grew since the prior year. The consistently lower level of perceived improvement in community care for the environment across D farms is notable, as is the significant increase for such farms between Y1 and Y2.

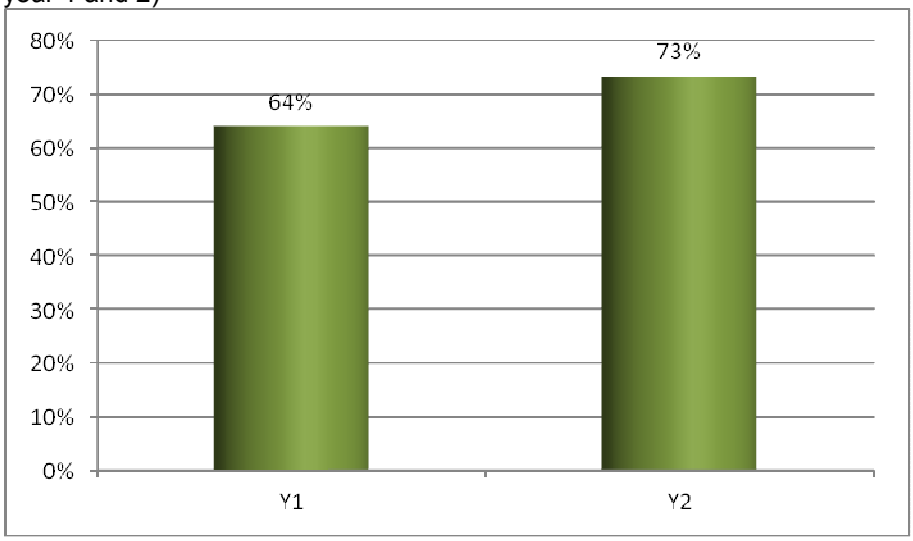
Figure 32: Certified farms reporting improved care for the environment Y2 (by group, year 2)



At the same time, our recording of actual environmental conditions and practices being applied is roughly equivalent across certified and conventional farms. As noted previously, the largest differences in environmental practices and conditions appear to be related to local context rather than whether or not a particular farm is actually certified or not. However, this conclusion does not necessarily suggest that certification is having no effect on the environmental performance of certified

farms. On the one hand, it is clear that certified farms are receiving significantly more training than their uncertified controls. It is possible that the training takes several years before it is integrated within actual practices (this is a particularly plausible explanation given the fact that most practices are transmitted through the cultural context and conditions and therefore take significant time to change).

Figure 33: Certified farms reporting improved care for the environment (across entire sample, year 1 and 2)



5. Lessons and Next steps

Field work, particularly in rural areas of developing countries, has been described as a set of lessons waiting to be learned. Three major lessons have emerged from this pilot work partnership between COSA and SECO.

1. Certification helps to make a positive difference. However, just being certified itself does not guarantee significant benefits. Certification results do vary and without adequate attention to the key outcomes in the field (such as yields, education, and safe environmental practices) positive results may not be achieved simply because producers have attained a certification. For example, in some cases certification is initiated and managed by a cooperative or export enterprise and while the basic requirements are being met, the investments in expected outcomes may not actually happen such that in some cases, producers are not even certain whether they are certified.

2. The findings of these and other studies now emerging are too important to be left to random or inadequate interpretation. A consortium of interested institutions, clearly positioned as being both neutral and credible, are a necessary step to help ensure fair and scientifically-robust interpretation of findings for policy determinations. In this way, the valuable information that SECO and others invest in will serve as an effective tool to not only improve the impact of sustainability interventions but also to progressively move international trade towards sustainability.

3. Since there is no magic bullet and the effects of certifications are different in different places, it is important to simplify metrics and encourage their understanding among both the certifications and the producers so that they can better understand their results and make informed choices that suit them.

Local institutional capacity is vital for this. The lack of basic farm information and basic understanding of sustainability issues requires building local process and capacity to cost-effectively gather data.

In each case, understanding what is working or what is not working, enables producer groups or businesses to focus on specific areas to improve and get the desired results. For example, in one place it may be erosion and water conservation that need the most attention and investment, in another it may be better organizational processes and lower costs of production. Knowing that will enable a more targeted focus for training, for policy and for investment.

On the **Economic** front, certified farms were found to have stronger economic performance than conventional farms consistent with the findings of year one. Some of the data, particularly on costs and yields, varied significantly across groups making it difficult to claim any strong clear trends thus far. Certifications may pay more in some cases, but it seems that modest premiums are insufficient to offset the costs of compliance with the certifications. So, in the absence of adequate remuneration to cover costs, the certification partners can focus on incorporating much more support for productivity (i.e. raising yields) or lower costs of production.

Social effects were less distinct with fewer marked differences between certified and conventional farms. The salient area here – and one that is consistent with findings in other regions – is the building of capacity through training for farmers. Here, the distinctions are clear and quite significant and consistent with earlier findings in year one.

Environmental outcomes, as a general rule, were less distinct than what could be expected from the certification process. The environmental conditions found on certified farms were often, though not always, not much better than those found on conventional farms. The explanation of time lags between certification and noticeable environmental impacts does not apply since many farms were already certified for at least two years.

One of the important observations arising from the data is that the variability of performance — from all perspectives, social, economic and environmental — appears to be significantly determined by the conditions of the region of production; in other words, it is somewhat contextual. Evidence of this is demonstrated by the high degree of variety in absolute values across the different production regions and controls. For example, although certified farms had consistently higher incomes compared with their controls, differences in revenue generation across regions were even more significant than the difference between certified and non-certified controls. This reinforces the importance of selecting appropriate controls and having thorough comparative data. However the degree of diversity in production conditions suggests that conclusions can be case-specific and thus present a challenge for the capacity to draw broad and simple policy conclusions.

As COSA considers its Next Steps, it recognizes that SECO support has made possible the application of COSA and the streamlining and improvement of the data collection and analysis process in Tanzania's coffee sector. Surveys are shorter, simpler, and yield more productive information. Moving forward, COSA intends to pursue the following key actions:

Technology - Automate the field survey process using notebook and tablet computers in the field rather than paper

Learning - Strengthen with a full time staff base (rather than consultants) to permit learning across countries and sectors and to reduce transaction costs

Institutions - Develop more formal engagements with institutional structures for more consistent research and analysis

Partners - Coordinated policy analysis projects with active partners such as ITC, UNCTAD or ICRAF

Thank you for the opportunity to learn together with you.
The COSA team

6. Appendix of Methodological and Field notes

The dual objective of accurate information and attributing field level impacts to project interventions is a complex endeavor that must allow for the counterfactuals. To do this credibly requires:

1. having a sound statistical approach
2. selecting proper control groups
3. using a neutral and well-designed survey tool
4. measuring beyond the one year "snapshot"
5. managing the process with a professionally competent team

Assessing the impact of interventions and correctly attributing it can be difficult for several reasons. One of the most common reasons is that farmers 'typically self-select' for pursuing certification rather participate randomly. It is therefore possible that the particular farmers who do self-select have characteristics that make them different from the overall population of farmers. These characteristics – such as greater assets, better skills, or entrepreneurial tendencies – could be the drivers of change rather than certification itself. COSA uses sampling designs and analytical techniques to control for such effects. However, it is not possible to completely do so and so care is taken to i.e., look for similar agro-ecological conditions, similar market organization, similar infrastructures and having similar socio-demographic characteristics. Another way to control for potential self selection bias is to compare post-certification results to pre-certification results of the same farmers. While such baseline comparisons may control for selection bias, they do not control for other conditions that could drive different results – such as bad weather or market conditions.

Sampling Methodology Used in Tanzania
The following provides a summary of the steps undertaken to set the sample in Tanzania:

Step I: Selection of national sample
The first step in the selection process was to obtain information on the spread of coffee producers at the national level. With this information the principal production regions in the country were selected (North, South and West), which represent 80% of the total producers.

Step 2: Selection of Certified farmers

- The next step was to identify certification programs operating in those regions. Producer groups with the certifications were contacted about the survey lists of registered farms were obtained from the certifying bodies and the participating producer organizations. Local level producer groups active in the target regions were identified and cross-referenced with villages in those regions.
- 6 treatment types were identified in the target regions: Fairtrade, Organic, Starbucks Café Practices, Fairtrade/Organic, Fairtrade Utz, and Fairtrade Café Practices. Because of limited differences among some and the difficulties attributing outcomes to those that are double certified, four groups are presented in this report.
- The COSA analysis team created a sampling target for the required amount of treatment and control farms in those regions and based on the number of villages with certified producer groups.
- To obtain a representative sample and eventually perform the proper econometric analysis, the COSA analysis team recommended that at least 75-95 farms were required for each treatment type (i.e. certification program or combination). As well that an equal amount (or higher) of control farms be selected.
- In each region, a random numbering tool was used first to select local level producer groups, then villages in those groups and then finally farmers in the selected villages.

- Through local partner organizations and government agencies, and finally guides in the villages, the physical locations of these farms were identified.

Step 3: Selection of the Control Group Sample

- Producer groups were identified in areas with characteristics similar to those of the certified producer groups (generally similar farm sizes, agro-ecological characteristics, coffee type etc.).
- The same selection process used as for the treatment farms i.e., randomly identifying villages and then individual farms, as well as gaining approval to visit those farms through support of partner and local agencies.
- The primary difficulty to identify control samples is finding producers that agree to participate. Two strategies were used to address this: building on the country coordinator contacts and knowledge of the groups and leveraging the relationships that COSA partners like TACRI, SUA, Technoserve and the Cooperative Unions, have with these groups.

Table A. Institutional relations

Institution	**Support rendered**
Ministry of Agriculture	Provided general support. Misters Kirenga and Maeda, direct support in tool adaptation. As well offered links to district and ward officials.
Technoserve	General support to project. Direct support in Tool adaptation
Tanzania Coffee Board	Approved project and provided information on sector. Leslie Omari was replaced by Adolph Kumburu;
Tanzania Coffee Assn.	Support with links to producers, exporters, traders and other supply chain actors.
KNCU	Direct support in tool adaptation; data collection
KCU	Direct support in tool adaptation; data collection
Kilicafe	Direct support in tool adaptation; data collection
TACRI	Support in background research
SUA	Support in adaptation and data for setting sample