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Smallholder participation and procedural compliance with sustainable cocoa certification programs

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ABSTRACT
Third-party certification programs promise to improve livelihoods and promote sustainable production, yet achieving such goals rests on certification programs working well with smallholder producers. However, little is known about how these programs work in practice from the perspective of smallholder cocoa producers. Furthermore, we do not know if third-party cocoa certification programs work the same way, even within common countries/contexts. Therefore, we examine three different smallholder cocoa certification schemes operating in Ghana to understand how smallholder cocoa farmers perceive the certification program requirements, price premium arrangements, and inspection regimes, among other things. While we find that smallholder cocoa farmers/stakeholders have a positive view of certification programs and their requirements, the results reveal that smallholder cocoa farmers are inadequately informed about the certification programs, disconnected from price premium management, and not participating in the compliance verification regimes required by the various standards. Our findings suggest improvements to the structures and procedures for certification participation, price premium management, and smallholder-level verification may increase the likelihood that third-party certification schemes sustainably improve livelihoods and agroecological systems.

KEYWORDS
Third-party certification; cocoa; smallholder farmers

Introduction
Private and voluntary third-party certification programs increasingly are used to promote producers’ adoption of specific agricultural practices (Auld 2010; González and Nigh 2005; Menozzi, Fioravanzi, and Donati 2015; Raynolds 2009). Certification programs tend to focus on one or more of three broad objectives: protecting consumer well-being; improving producer and labor well-being; and environmental protection (Waldman and Kerr 2014). Sustainability-oriented certification programs recognize that achieving their objectives will raise farmers’ costs of production and therefore seek to cover such costs by offering producers a price premium for certified goods. At the same time, the
implementation of sustainability-oriented certification programs has triggered hope that such programs might also improve smallholders’ livelihoods. Despite the growth of certification schemes, there remains a shortage of evidence on how they actually work from the point of view of smallholder farmers (Fenger et al. 2017; Fountain and Hütz-Adams 2015). One step towards evaluating such programs’ impacts on adoption of sustainable farming practices and improved livelihoods is to understand how certification programs work at the level of smallholder farmers, as opposed to how those programs ‘officially’ work. Therefore, this paper examines three cocoa certification schemes operating in Ghana to better understand how sustainable cocoa certification programs work (and do not work) from the perspective of smallholder farmers. Doing so will provide a foundation for subsequent work on evaluating the efficacy of such programs for meeting sustainability, livelihood, and other programmatic goals.

The preponderance of previous studies on sustainability-oriented certification in developing countries focuses on coffee (e.g., Bacon 2005; Barham and Weber 2012; Chiputwa, Spielman, and Qaim 2015; Philpott, Bichier, Rice, and Greenberg 2008; Raynolds 2009; Ruben and Fort 2012; Valkila and Nygren 2010; Rich et al. 2018). At the same time, cocoa and other crop certification programs are increasing around the world, including cocoa certification programs in West African countries (Basso et al. 2012; Djokoto, Owusu, and Awunyo-Vitor 2016; Fenger et al. 2017; Paschall and Seville 2012), and organic-certified pineapple programs in Ghana (Kleemann, Abdulai, and Buss 2014), for example. Given the growth of these programs, the perceptions of smallholder farmers regarding sustainable cocoa certification programs matter because 1) conservation behavior of farmers (and attendant ecological outcomes) have been found to be influenced by farmers’ attitudes and perceptions regarding natural resources and the environment (e.g., Dolisca et al. 2009), 2) farmers’ perceptions of conservation program attributes have been found to correlate with program adoption (e.g., Greiner and Gregg 2011; Liu, Bruins, and Heberling 2018; Tosakana et al. 2010), and, 3) compliance with agro-environmental programs (e.g., regulations) have been found to correlate with farmer awareness of program rules and enforcement practices (e.g., Winter and May 2001). The actual functioning of sustainable cocoa certification programs also matters because it can impact the agro-ecological sustainability of the target crops, the social and environmental sustainability of producing communities, the in-country program sustainability (financial viability and farmer wellbeing), and the consumer market viability of such certification schemes (e.g., if consumers come to believe that they are paying price premiums for nothing, they might lose trust and stop supporting such programs).

Therefore, this paper examines how smallholder cocoa farmers in Ghana perceive third-party certification programs that promote sustainable-cocoa production. We focus on examining farmers’ awareness of the sustainable cocoa
certification programs’ objectives; farmers’ agreement with certification requirements; farmers’ level of agreement with their farmers group’s decision making, and farmers’ expected and realized benefits for participating in the certification program. Each of these aspects has the potential to undermine agro-ecological and programmatic sustainability. For example, if smallholder cocoa farmers are not aware of most of the objectives of a certification program, they may not understand that earning a price premium depends on meeting those objectives, which could undermine program success. Similarly, cocoa farmers who disagree with some certification program requirements may be less likely to maintain them or may discontinue participation. Since the certification programs we study are implemented via farmers groups and utilize collective decision making, smallholder cocoa farmers who disagree with group decisions may be more likely to decide not to abide by decisions or discontinue participation. Likewise, if cocoa farmers’ expected benefits from their participation in certification programs greatly exceed their realized benefits, they may be more likely to discontinue participation. Thus, understanding how smallholder cocoa farmers perceive Ghana’s sustainable cocoa certification programs will lay a foundation for further inquiries into the efficacy of such programs and contribute to improved knowledge of how programs function in practice.

Using a mixed-methods approach, we examine three sustainable cocoa certification programs in Ghana, the world’s second largest producer of cocoa. In-depth interviews and focus groups were used to provide a first-hand understanding from the perspective of cocoa intermediaries and smallholders of how sustainable cocoa certification schemes work in Ghana. Those insights also helped to frame and focus a household survey of smallholder cocoa producers in communities where sustainable cocoa certification programs operate. The data from in-depth interviews, focus groups, and a household survey are used to address questions related to smallholder perceptions of sustainable certification programs, how such programs work (or do not work) from the point of view of smallholder cocoa producers, and provide a foundation for better understanding why such programs succeed (or fail). Specifically, we focus on how smallholder cocoa farmers perceive i) the objectives of sustainability certification, ii) certification program requirements, iii) their certified farmers group’s decision making, iv) the adequacy of farm-level certification inspections, and v) the expected and realized benefits (e.g., price premiums) of certification. Doing so sheds light on Ghana’s sustainable cocoa production system and provides a foundation and framework for further investigations.

After brief discussion of third-party certification programs, we highlight aspects of cocoa certification literature and describe cocoa production in Ghana. Next, we describe our research methods before presenting and discussing our results. We conclude with a discussion of the findings in light of existing literature.
Standards and certifications for agricultural commodities have evolved through several means including governance tools in trade and value chain relationships (Auld 2010; Herzfeld and Jongeneel 2012). Third-party certification programs typically use market mechanisms to change production and trading practices that, in turn, impact consumer and producer welfare and ecosystems (Barham and Weber 2012; Ruben and Zuniga 2011). Third-party verification for food safety standards is an important component of the global food system and increasingly it is a condition of producer access to high-value markets (Henson and Reardon 2005). Meanwhile, the popularity of third-party certification schemes for sustainability may be seen as a response to growing public concern about social injustices and environmental degradation associated with conventional agricultural production of commodity crops (Lazaro, Makindara and Kilima 2008; Taylor 2005). Certification programs for sustainability typically have been initiated by non-governmental organizations (NGOs) and implemented through public-private partnerships, with voluntary participation of farmers/producers (Barham and Weber 2012).

Cocoa certification programs grew out of initiatives undertaken by stakeholders in the cocoa economy to promote sustainable cocoa production, producing cocoa in ways that help mitigate economic, social, and environmental issues (Basso et al. 2012; Hütz-Adams and Fountain 2012; Paschall and Seville 2012). For most programs, sustainability certification serves as a catch-all for these socially and environmentally desired characteristics, rather than certifications based on food safety of ingredients. The share of certified cocoa globally has steadily increased since the introduction of certification programs, reaching about 3% of world cocoa sales in 2009, 6% in 2010 and 30% in 2013 (Fountain and Hütz-Adams 2015; Hütz-Adams and Fountain 2012; Weiligmann, Verbraak, and Van Reenen 2010).

Ideally, sustainability-oriented certification programs offer mutual benefits for all parties: consumers, producers, and marketers. They offer consumers opportunities to use their purchasing power to support beneficial social and environmental practices in and around producers’ communities. For producers, they offer opportunities to adopt more sustainable production practices, receive better crop prices to compensate for their additional efforts, access stable markets, and acquire support for community development projects. For processing and retailing companies, some argue that by participating in third-party certification they are able to capture niche markets of producers and consumers as well as align demand and supply for sustainably grown crops (Mahrizal et al. 2012; Raynolds 2009; Valkila and Nygren 2010).
Prospects and challenges of cocoa certification

Although some elements of the production process for certified cocoa are not too different from the traditional processes, it involves increased costs to growers (Gockowski et al. 2013; Waldman and Kerr 2014). This means the gains to farmers from cocoa certification need to offset their costs in order to incentivize participation (Basso et al. 2012; Mahrizal et al. 2012). The benefits to participating producers principally flow from sufficient and stable prices and premiums as well as increases in output (Gockowski et al. 2013). Generally, certified cocoa has attracted price premiums of about 10%. The proportion of the premium that goes into organization, administration, community development, and direct payments and services to farmers varies by certification scheme and producer group. However, the premium does not seem to have a great impact on farmers’ actual income. This may be because of the costs of meeting certification standards and the fact that some certified cocoa beans end up being sold as conventional cocoa (Basso et al. 2012; Fountain and Hütz-Adams 2015; Mahrizal et al. 2012).

Kleemann, Abdulai, and Buss (2014), focusing on crop certification schemes, point out divergent and sometimes conflicting findings of previous studies on the impacts of certification schemes on farmers’ wellbeing. In addition, although Fenger et al. (2017) report a positive impact of Rainforest Alliance certification on participating farmers’ natural and financial capital, they caution that such positive impacts depend on Rainforest Alliance’s ongoing financial support, technical assistance, and increased access to inputs and credit for participating farmers. Some previous research on cocoa certification highlights how methodological and other limitations have made it difficult to make conclusive statements on such programs’ impacts on farmers’ wellbeing (Basso et al. 2012; Gockowski et al. 2013; Hütz-Adams and Fountain 2012; Ingram et al. 2014; Paschall and Seville 2012). Thus, further evidence that gathers farmers’ perspectives on their expected and realized benefits from participating in Ghana’s cocoa certification programs can contribute to this literature.

Because consumers are unable to independently evaluate the attributes of credence goods such as certified cocoa (Lemeilleur, N’Dao, and Ruf 2015), verifying farmers’ compliance with the production practices and standards of certification schemes is essential for advancing certification goals and accurately assessing their impacts (if any) (Barry et al. 2012; Blackman and Rivera 2010). Achieving program goals around protection of the environment and treatment of laborers depends on the meaningfulness of the standards, the extent to which producers join the certification program (and adopt its standards), and the extent to which compliance is verified (Waldman and Kerr 2014). There are doubts about smallholders complying with certification requirements and adopting sustainable practices after they initially join
certification schemes (Ruben and Zuniga 2011). Although participatory
guarantee systems are not third-party certification schemes, a recent study
in Mexico based on 32 in-depth interviews examining a participatory organic
certification system highlighted challenges that are relevant for third-party
schemes including the significance of ill-defined consequences for farmers’
noncompliance (Bara et al. 2018). A better picture of how smallholder cocoa
producers in Ghana view certification schemes along with the actual functioning of the schemes will contribute to this growing body of literature.

Most sustainability-oriented certification schemes, especially cocoa certifi-
cation, feature “group certification” for smallholder farmers. Group certifica-
tion is likely a requirement because the cost of direct certification on individual
farms can be too expensive. Group certification focuses on groups of participating farmers (i.e., farmer collectives) for disseminating, overseeing, and
regulating the certified production practices and standards. The groups, in
turn, are supposed to train, advise, and supervise their member farmers.
Lazaro, Makindara, and Kilima (2008), in their work on sustainability stan-
dards for coffee in Tanzania, pointed out the challenge of getting smallholder producers to comply with the general certification standards and practices of such programs. The use of group certification may or may not improve smallholder farmer compliance with certification schemes, procedures, and practices.

Some evidence suggests that cocoa certification leads to capacity building,
community development, and increased productivity, although organic cer-
tification has been associated with a decline in productivity, especially in the
initial years (Basso et al. 2012; Ingram et al. 2014). It has been reported that participation in a cocoa certification scheme (Rainforest Alliance) may be
associated with positive impacts on natural and financial capital as compared
to conventional growers (Fenger et al. 2017). Cocoa certification may provide
farmers better access to inputs, training, and credit as well as increases in
yield, productivity and product quality. At the group level, improved financial
viability, organizational capacity, and political representativeness may also be associated with certification schemes (Basso et al. 2012; Gockowski et al.
2013; Hütz-Adams and Fountain 2012; Ingram et al. 2014; Paschall and Seville 2012). In Ghana, participants in cocoa certification programs receive
access to certified markets through licensed buying companies (LBC), which
are supposed to pass along a price premium to growers (Gockowski et al.
2013). However, actual practice and procedures regarding price premiums
for smallholders engaged in certified cocoa productions in Ghana have not
been sufficiently documented.

Despite these prospective gains from certification, a number of difficulties
have been associated with third-party certification regimes including: farmer
discontent with premiums and pricing, lack of credibility of certification
auditing, poorly functioning farmer organizations, increased barriers for
farmers to participate in certification programs, persistence of gender inequality, and high compliance cost (Basso et al. 2012; Fountain and Hütz-Adams 2015; Hütz-Adams and Fountain 2012; Weiligmann, Verbraak, and Van Reenen 2010). Concerns have also been raised about multiple certification organizations working in the same place simultaneously, which potentially creates confusion and raises administrative costs, and also cases in which some farmers have to sell certified cocoa as conventional, thus reducing their income and undermining the certification initiative (Basso et al. 2012; Fenger et al. 2017; Fountain and Hütz-Adams 2015; Hütz-Adams and Fountain 2012).

**The landscape of sustainable cocoa certification in Ghana**

Sustainable cocoa is currently being certified in Ghana by four standard-setting organizations – i) Fair Trade Labeling Organization (FLO), ii) UTZ Certified (UTZ), iii) Sustainable Agriculture Network-Rainforest Alliance (SAN-RA), and iv) International Federation of Organic Agricultural Movements (IFOAM) (Basso et al. 2012; Hütz-Adams and Fountain 2012; Mahrizal et al. 2012; Paschall and Seville 2012). FLO, UTZ, SAN-RA, and IFOAM share the goals of promoting production of cocoa through sustainable agricultural practices, improving farmer livelihoods, and capacity building. However, each of the standards has its own principle thematic area(s) – FLO is concerned with trade relations; UTZ and SAN-RA focus on productivity issues; and IFOAM focuses on organic production and food safety. The organic certification (IFOAM) calls for some practices that unique to organic certification such as farmland being free of prohibited substances during the three years before harvest of the output to be certified (CA 2013; FLO 2011; Mahrizal et al. 2012; UTZ 2009). As a result, we did not include the organic certification scheme (IFOAM) in the study because IFOAM differs significantly in its practices, implementation criteria, and size. To be clear, although we and others refer to these four organizations as certification organizations, they are standard setters that enable others to perform actual certification, inspection, and oversight of farmers, groups, and production processes.

Promoters of cocoa certification in Ghana partner with existing licensed buying companies (LBC) and use them to organize farmers into groups for “group certification.” Group certification is believed to reduce transaction costs and information asymmetries as well as consolidate verification responsibilities (Gockowski et al. 2013; Fountain and Hütz-Adams 2015). Fairtrade International and Fairtrade Africa (2014) indicates that there are 11 certified producer organizations in Ghana with 95,900 farmers producing 45,800 metric tonnes of certified cocoa on 146,800 hectares. The website of UTZ indicates that there are currently 16 producer groups certified in Ghana. This may reflect an increase from 2014 or perhaps a difference in the working
definition of producer organizations/producer groups. At the same time, SAN-RA reports certifying 7,000 cocoa farmers with about 34,000 hectares as of 2011 (Paschall and Seville 2012). According to Basso et al. (2012), the certified cocoa market shares for FLO, UTZ, and SAN-RA are 39%, 25%, and 20%, respectively. Table 1 illustrates the amount of cocoa produced and sold as certified under FLO, UTZ and SAN-RA standards in 2009, 2011 and 2013.

Although they share a common goal of enhancing sustainable cocoa production, the different certification standards in Ghana have their own codes of conduct. While these codes include similar items, in practice they place emphasis on different issues and associate themselves with their particular concerns in the market, while seeking to comply with all other requirements (Basso et al. 2012; Mahrizal et al. 2012; Raynolds 2009). The codes of conduct for FLO, UTZ, and SAN-RA specify required certain practices organized under broad themes such as “good agricultural practices;” “management of natural resources and biodiversity;” “communities and social responsibilities;” and “internal control systems.” The various standards have some differences in their requirements relating to natural resources and the environment; genetically modified organisms; wages for farm workers; registration and other fees; amount and distribution of price premiums; and compliance audits (Basso et al. 2012).

Individual farmers in Ghana may only participate in certification programs as part of a participating “farmer organization.” Farmer organizations seeking cocoa third-party certification first register with the certifying organization and, after doing so, learn about the detailed requirements of that certification program’s code of conduct. Most of the production and process changes resulting from certification requirements happen at the individual farm level. After agreeing to engage in the certification process, the participating farmer organization conducts an audit using an Internal Control System called for by the certification scheme to evaluate its readiness for certification. This audit typically involves visiting group members’ farms and

Table 1. Trends in production and sale of certified cocoa (1000 tonnes).

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2011</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UTZ</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Produced as Certified</td>
<td>5</td>
<td>214</td>
<td>691</td>
</tr>
<tr>
<td>Sold as Certified (%)</td>
<td>0 (0)</td>
<td>43 (20)</td>
<td>297 (43)</td>
</tr>
<tr>
<td><strong>FLO</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Produced as Certified</td>
<td>65</td>
<td>124</td>
<td>176</td>
</tr>
<tr>
<td>Sold as Certified (%)</td>
<td>0 (0)</td>
<td>46 (37)</td>
<td>60 (34)</td>
</tr>
<tr>
<td><strong>SAN – RA</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Produced as Certified</td>
<td>13</td>
<td>98</td>
<td>571</td>
</tr>
<tr>
<td>Sold as Certified (%)</td>
<td>0 (0)</td>
<td>65 (66)</td>
<td>279 (49)</td>
</tr>
<tr>
<td><strong>All</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Produced as Certified</td>
<td>83</td>
<td>436</td>
<td>1438</td>
</tr>
<tr>
<td>Sold as Certified (%)</td>
<td>0 (0)</td>
<td>154 (35)</td>
<td>636 (44)</td>
</tr>
</tbody>
</table>

TCC 2015
assessing various control points spelled out in the applicable code of conduct. When a farmer organization believes it is ready for certification, an external auditor specified by the certifying organization is supposed to evaluate its readiness for certification. Not all certification requirements must be met before a farmer organization may be certified; applicants typically have a three-year transition period. After initial certification, newly certified farmer organizations are supposed to be reevaluated (i.e., verified) based upon the certification standards at regular intervals (e.g., every three years) to ensure compliance (Basso et al. 2012; Fountain and Hütz-Adams 2015; Mahrizal et al. 2012).

**How smallholders produce cocoa in Ghana**

Like other West African countries, cocoa production in Ghana is predominantly done by smallholder producers: about 80–90% of production is done on farms that are about 1 to 3 hectares (Basso et al. 2012; Darkwah and Verter 2014; Paschall and Seville 2012). These small cocoa farms are operated as household enterprises, with households providing the majority of the farm labor (Kyei, Foli, and Ankoh 2011). Cocoa-producing households are mostly poor (Paschall and Seville 2012), have limited access to credit (Darkwah and Verter 2014), and therefore typically are unable to invest substantially in their farms (Basso et al. 2012). As a result, typical smallholder cocoa producers rely on traditional farming practices (Darkwah and Verter 2014), including the use of child labor (Paschall and Seville 2012), and the clearing of vegetation for cocoa tree planting (Kyei, Foli, and Ankoh 2011). Smallholder cocoa producers also face additional challenges including the susceptibility of cocoa trees to pests and diseases, and changing climatic conditions (Basso et al. 2012; Darkwah and Verter 2014). For example, the incidence of pests and diseases related to cocoa production often requires the use of chemicals, which requires knowledge and skills that most small holder cocoa producers do not have.

As a result of increased sustainable cocoa certification initiatives, smallholder cocoa producers have increasingly been made aware of negative impacts related to their ‘traditional’ production practices together with learning about ways to mitigate them. In particular, reducing and/or eliminating deforestation and land degradation resulting from slash and burn farming as well as the incidence of child labor have been highlighted as program objectives for sustainable cocoa certification program (Paschall and Seville 2012). Also, widespread and unregulated use of chemicals in cocoa production have raised health and safety concerns that certification programs try to address through their support for the use of protective clothing during chemical application and protection of biodiversity (e.g. disposal of chemical waste through environmentally friendly means). As a result, the general understanding among smallholder cocoa
producers in Ghana is that producing certified cocoa means that they must make significant changes in their farming practices but that cocoa producers also gain access to resources that enhance their ability to implement the desired (required) changes.

Changing Nature of Cocoa Production

There is a growing body of literature that is advancing the idea that cocoa-certification programs (and other cocoa sustainability initiatives) are responses to farmers’ diversification away from cocoa (Ruf and Schroth 2015). Cocoa farming has been identified as a major driver of deforestation in West Africa as farmers first grew cocoa after forest clearing and, instead of replanting again plantations, farmers moved to establish new cocoa farms (Ruf, Schroth, and Doffangui 2015). Researchers have identified forestland as a production factor in cocoa farming (e.g., Clough, Faust, and Tscharntke 2009) and how farmers tend to diversify away from cocoa when their cocoa trees need to be replaced. Some argue that in response to concerns about possible shortages of raw materials (i.e., cocoa), which may result from cocoa farmers choosing to diversify their crops, Western Multinationals have teamed up with other stakeholders to promote cocoa sustainability (e.g., Paschall and Seville 2012). Therefore, better understanding of how farmers perceive sustainable cocoa certification programs can provide a foundation for understanding the changing nature of cocoa production and associated ecological and social impacts.

Methods

A mixed-method study using both qualitative and quantitative methods collected data related to the principal research questions. Qualitative data were gathered through i) in-depth interviews with officials working with (1) Ghana’s cocoa board, (2) cocoa certification standards, (3) licensed buying companies, (4) capacity building organizations, and (5) audit firms; and ii) focus group discussions with farmers from six cocoa growing communities. Not wishing to rely on ‘official’ descriptions of how things work and absent accessible documentation and detailed records of where certification has been implemented in Ghana, we used in-depth interviews with experts to identify cocoa growing districts where FLO, UTZ, and SAN-RA certification standards were being implemented and to help us develop an understanding of how smallholders engage in cocoa production and sustainability certification. The focus groups with farmers were designed to directly collect data on the research topics as well as help test and validate concepts and wording for the subsequent household survey. Both the focus group discussions and the in-depth interviews were useful in designing and testing the survey instrument (Weiss 1995; Corbin and Strauss 2015). The household survey of certified and non-certified farmers in the
selected communities enabled the collection of quantitative data which could be analyzed using statistical methods (Dillman, Smyth, and Christian 2014, Fowler 2013).

The in-depth interviews revealed that the FLO, UTZ and SAN-RA standards had been implemented in 39 cocoa producing districts in five of the six cocoa growing regions of Ghana. These three programs, we learned, were being implemented in communities either through a farmer cooperative or a licensed buying company (LBC). At the time of the study, there were eight licensed buying companies, 15 farmer cooperatives, and two licensed buying company-cum-farmer cooperatives involved in the implementation of cocoa certification in Ghana. We used stratified random sampling to select six districts, two per certification standard yielding three districts implementing the standard through licensed buying companies and three districts implementing via farmer cooperative. For each of the selected districts, a list was generated of those communities within the district where cocoa certification was being implemented exclusively under a particular standard.

After the list of communities was generated, their number of households was estimated based on each district’s 2010 population and housing census report. Because of logistical limitations and the desire to focus on smallholder cocoa producers, we purposely selected communities with estimated household numbers between 200 and 300 for inclusion in the set of possible study communities. This allowed us to effectively and efficiently implement household enumeration and facilitate data collection. We selected two communities for each of the three certification standards – one for each implementation channel (i.e., licensed buying company or farmer cooperative). Doing so allowed for comparative analyses across the three schemes (FLO, UTZ, SAN-RA) and two implementation channels (LBC or cooperative). More details of the sampling framework is found in Appendices A and B, and Figure 1 presents the geographical location of the study communities.

**Qualitative methods**

Cocoa certification program officials for the in-depth interviews were selected purposively using a snowball sample technique starting with contacts at the Cocoa Research Institute of Ghana (CRIG) (Berg 2009; Weiss 1995). A total of 16 in-depth interviews were conducted – four with Ghana cocoa board (COCOBOD) officials; three with officials of licensed buying companies; four with certification standard officials; two with capacity building organization officials; two with officials of external auditing firms; and one with an official of an international development organization. The in-depth interviews took place over a six-week period.

Potential participants in the focus group discussions were selected purposefully (Berg 2009; Weiss 1995). Some considerations behind participant
selection included participant availability and characteristics such as gender, certification status, and social status (age, community leadership, migrant/native, etc.). One focus group was conducted in each of the six selected communities with farmers recruited by convenience sampling. A total of 56 farmers participated in one of six focus group discussions.

Separate guides were developed and used to conduct the in-depth interviews and focus group discussions (Berg 2009; Corbin and Strauss 2015; Weiss 1995). These interview/discussion guides covered issues on organizing farmers for certification, training of farmers, auditing and monitoring farmers for compliance, issuance of certificate, purchasing of certified cocoa beans, and distribution and management of premiums. The in-depth interviews and focus groups were also used to get feedback on possible survey questions. The in-depth interviews were conducted in English while the focus group discussions were conducted in Twi. All interviews and focus groups were audio-recorded (with participants’ consent) and subsequently transcribed in English.

The data from the in-depth interviews and the focus group discussions were analyzed using iterative coding (Corbin and Strauss 2015; Saldaña 2016). The transcripts were coded manually with text, phrases, and statements tagged with codes that highlighted “significant phrases” and subsequently linked them with
concepts that ‘make meaning’ from them (Saldaña 2016, 9). So, the initial open coding of the transcripts was followed by selective or axial coding in a process that linked the data to ideas and, subsequently, to categories of knowledge and themes pertinent to our study (Corbin and Strauss 2015).

Quantitative methods

The household survey questionnaire was iteratively developed and finalized based on the research objectives together with the findings and feedback from the in-depth interviews, focus groups, and pretesting. A five-day training and pretest program provided the fieldworkers with the necessary skills, knowledge and instructions to implement the survey as well as improve the survey based on feedback from pretests. The questionnaire was pretested in a cocoa growing community with cocoa certification that was outside of the survey sample frame. The Census and Survey Processing System (CSPro) was used to design a Computer Assisted Personal Interview household questionnaire for field implementation.

Potential survey respondents (i.e., cocoa farmer households) were randomly selected in each of the six communities in the study. The cocoa farmer households, both certified and non-certified farmers, in the study were selected using stratified random sampling approach (Dillman, Smyth, and Christian 2014; Fowler 2013). Upon arrival of the survey team in each of the six selected communities, a complete enumeration of all households in the community was undertaken. The enumeration identified cocoa farming households including households participating in certification. Then using strata of certified and non-certified households, a random sample of potential respondents was drawn for both certified and non-certified households in each community. Details of the number of households enumerated per community are presented in Appendix A.

Altogether, 352 farmer households were selected for the household survey. Specifically, 30 certified and 30 non-certified farmer households were randomly selected in each of five communities. The sixth community only had 22 certified farmers, so they were all included, together with 30 non-certified farmers, in the sample for that community. Each selected household was visited multiple times in an effort to maximize response. The household survey had an 88.6% response rate with 312 completed surveys from 150 certified and 162 non-certified farmers.

Descriptive statistics (e.g., percentages) were used to initially analyze the collected survey data for survey items such as farmers’ knowledge, modes of choosing group leaders, and farmers holding group leadership positions. Other survey items such as group meeting attendance, levels of agreement with group decisions, certification requirements, and expected benefits were analyzed using those items’ mean responses. Some analyses were undertaken using one-way ANOVA to test the difference in mean responses across particular variables such as certification standards. Other analyses looked at differences in the
distributions of scores such as with the levels of agreement with group decisions across the certification standards where we used the Kruskal-Wallis test. T-tests were used to test the differences in mean scores for the levels of agreement with certification requirements and expected benefits for certified and non-certified farmers. While equal numbers of certified and non-certified households were selected from each community for this study, the actual numbers of certified and non-certified households enumerated in each community was different. As a result, probability weights were used to correct for the unequal probabilities that certified and non-certified households were selected for the study, and all statistical tests account for the survey weights. Detailed information on the probability weight calculations can be found in Appendix C.

Results and discussion

First, we present the results from the focus groups and the in-depth interviews under four salient thematic areas, then we present the results of the smallholder cocoa farmer survey.

In-depth interview and focus group results

Structures and procedures for implementing certification programs

In-depth interviews with officials of COCOBOD, the regulatory body of Ghana’s cocoa sector, made clear that COCOBOD manages cocoa certification in Ghana through the use of public-private partnerships (PPPs). COCOBOD currently has no single division or unit exclusively focused on cocoa certification. It turns out that the Cocoa Health and Extension Division (CHED), Cocoa Marketing Company (CMC), Quality Control Company (QCC), and the Research, Monitoring and Evaluation unit are all involved with aspects of cocoa certification in Ghana. COCOBOD officials reported that they are starting a review of all third-party cocoa certification manuals as well as cocoa market dynamics and PPPs involving cocoa. One of the stated goals of such endeavor was the creation of a single government document regarding the regulation of cocoa certification in Ghana.

The in-depth interviews shed light on the current process used by companies and organizations interested in implementing cocoa certification in Ghana (i.e., entering into PPPs). First, organizations go through a process of assessing potential cocoa producing partners (i.e., cocoa farming communities). If leaders of the targeted cocoa-growing community approve of moving forward with a cocoa certification process, then the certifying organization undertakes a community-wide information dissemination effort. Cocoa farmers in the community (18 years old or older) are invited to join farmer groups and learn about and undertake the required certification processes. The farmer groups participating in cocoa certification that were
 mentioned by in-depth interviewees include farmer cooperatives, groups associated with a licensed buying company, or a hybrid of cooperatives and LBC farmer groups.

The focus group discussions revealed that farmers interested in joining a farmer group for certification purposes typically have to pay about GH ° (~ US $5) as a one-time membership registration fee and that farmer/members must attend meetings once or twice a month. We learned that the six communities in our study area have farmer groups that have been certified by FLO for two or five years, by UTZ for two or three years, and by SAN-RA for one or two years.

The three cocoa certifying organizations operating in the study area espouse an expectation that participating certified cocoa farmer groups operate under democratic principles with an emphasis on transparency and awareness. As one certification official put it:

...you must have membership list, there must be leadership, there must be evidence that those elections are done according to democratic principles, transparency and stuffs like that, and then the membership must be aware as to what is it that they are signing onto, so there must be information some evidence that the people understand what [CERTIFICATION STANDARD] is about, what their responsibility in it would be, what their expectations of it should be at the basic level. (IN020201)

At the same time, some certification officials expressed concern about the current nature of certified farmer groups and those groups’ ability to follow and implement such democratic principles. As one official of a capacity-building organization pointed out:

And you know certification is voluntary, and like I said it doesn’t necessarily mean that it promotes the formation of groups, because most of the groups that have come out with these certification [standards] are not strong groups, they don’t have any legal binding, they don’t have any cooperative binding, and most of them are not even registered so how then do you define such a group (IN050201).

Other officials during the in-depth interviews reported that farmer groups organized under the cooperative system seem to do better incorporating democratic processes than farmer groups working with LBCs and organized apart from the cooperative model. It was also reported during the in-depth interviews that farmer group cooperatives appear to have stronger leadership and bargaining power than other types of farmer groups.

Training and compliance verification
The in-depth interviews and focus group interviews revealed that after a community has agreed to participate in cocoa certification and its farmer groups have been formed, a train-the-trainers approach is used to teach the community’s farmers about certification requirements and objectives. The initial training participants (future trainers) are selected from each farmer group with the expectation
that they become part of the community’s internal control/management system (ICS/IMS) for the organizing farmer cooperative or licensed buying company. These training programs are conducted by capacity building organizations hired by the organizing farmer cooperative or licensed buying company. The training process typically takes six months.

The certification process relies on communities’ ICS/IMS for both internal and external inspection plans. Internal inspections are supposed to take place at least once a year with the expectation that all farmers in the certification groups be inspected during each internal inspection. The certification guidelines also call for well-documented internal inspections. As one licensed buying company official explained to us:

...the group administrator will select a number of internal inspectors [that] could be hired or could come from the same community or could come from the group who train on internal inspections protocols. These inspectors will then go around doing inspection of each member’s farms which hundred per cent of the farms must be internally inspected to meet the requirement. (IN020301)

Underscoring the expectations of internal inspections, one certification standard official pointed out that:

So you do the internal inspection, you document it and then if an auditor comes, he will be able to identify that you are working with 1000 farmers, [that] this is their farm characteristics or farm profile. (IN020101)

A process of internal inspections and resulting corrective measures is supposed to be ongoing until the ICS/IMS is satisfied that the group meets the standards. At that time, an outside auditor is supposed to conduct an external inspection. In some cases, the ICS/IMS may invite an auditor to do a pre-audit before the official external inspection. All of the various certification schemes call for each participating farmer group to be externally inspected at least once within a certification cycle, which takes 3 or 4 years. The extent of external inspections covers examination of the entire system of operation of participating farmer groups (e.g., document review, farm visits, key personnel interviews). Each participating farmer group is supposed to randomly select farmers from their group for the initial farm visits and inspection activities. If the external inspectors find nonconformities, those issues/nonconformities are supposed to be corrected as part of “continuous improvement” before the farmer group is to be certified.

The in-depth interviews explored the process and use of internal inspections. The internal inspectors, we learned, are usually lead farmers chosen by the licensed buying company or farmer cooperative officials. As one certification officer for a licensed buying company explained,

...the lead farmer should be somebody who can read and write and should know something about the work that he is doing, that is the farming, he should understand
the code of conduct and the training that he is supposed to do. So basically, we don’t put emphasis on certification and those kind of things [academic/formal qualifications], it is about reading, it is about understanding the code of conduct, it is about understanding the cocoa work (IN030101).

In an attempt to avoid conflict of interest, “internal inspectors” typically inspect participating farms outside of their community of residence. For the “external inspectors” used by certification schemes, the farmer groups working with SANRA and UTZ certifications select an accredited external inspector (i.e., certification body [CB] or auditor) in consultation with the LBC or farmer cooperative involved. The external inspectors under the FLO certification regime are private consultants employed and assigned by FLO-Cert, a member of the Fairtrade group.

The importance of both internal and external inspections to the legitimacy of certification programs was voiced clearly by one in-depth interviewee who does external auditing: “Auditing forms one of the core pillars of certification scheme” (IN050301). The external audits are key elements of certification schemes that allow for claims to be made and substantiate that certified cocoa beans have been produced using sustainable practices. However, some of the certification officials we interviewed voiced concerns about the credibility of some inspections/auditing. As one external auditor shared with us:

Yes, I have witnessed an internal officer cheating. Some give recommendations that do not reflect with observations, field officers giving false information, and checklist not properly filled out. I have personally caught a project officer filling in forms for the farmers (IN050301).

This observation supports a previous observation that “some voluntary certification schemes embrace weaker selection criteria and thus provide opportunities for large companies to “green wash” their image” (Ruben and Zuniga 2011, 102).

**Price premium management and distribution**

The in-depth interviews and focus group discussions examined the price premiums paid for certified cocoa. The officials in their in-depth interviews revealed that the price premiums are negotiated by local LBC with offshore cocoa buyers (mainly processors) prior to the implementation of a particular certification project. That is, licensed buying companies first establish contracts with external buyers for specified amounts of certified beans at specific price premiums before the LBC undertakes implementation of a certification project in a cocoa growing community. Therefore, the decision regarding how much of the price premium is passed on to the farmers seems to be determined by the participating licensed buying company. However, the LBCs fund and oversee the implementation of the certification process in participating communities (including instances where implementation is done through a farmer cooperative). Therefore, the LBCs reimburse themselves for the cost of certification implementation before distributing the remaining funds to farmer groups.
The in-depth interviews and focus groups also explored how the price premium funds are distributed to participating farmers. It appears that price premium distribution largely depends on the structure of the certified farmer groups. In cooperative-based groups, the price premium is paid as a lump sum to the group. Then, the group leader (typically referred to as the lead farmer) works with members of the farmer group to decide the distributional shares for individual farmers and other collective uses (e.g., purchase of inputs and community projects). In cases where the farmer groups are LBC-based, the bulk of the price premium funds is controlled by the LBC. These LBCs decide (sometimes in consultation with lead farmers) how much of the price premium funds go to individual farmers as cash and how much go for other uses (e.g., inputs and community projects). One focus group participant described the price premium system:

Our [farmer] organization does not decide the amount of premium to be paid to farmers. All decisions regarding the amount to be paid are made by the officers from [licensed buying company]. They set the amount to be paid per bag of cocoa e.g., this year GH₵ 15.00 was paid as premium per bag of cocoa (FG030701).

According to the three certifications’ codes of conduct, the net amount of money that certified groups receive as price premiums is supposed to be distributed among various uses based on the decisions of the group members (CA 2013; FLO 2011; Mahrizal et al. 2012; UTZ 2009). However, the focus group discussions and in-depth interviews do not find this to be the case in the study area. This finding is consistent with Ruben and Fort (2012); that is, farmers apparently do not receive enough information about Fair Trade price premiums, nor do they participate in price premium decisions. It appears from our in-depth interviews and focus groups that the licensed buying companies unilaterally make decisions regarding price premiums. Although such an approach might enable licensed buying companies to maximize the returns on their investments in the certification process, it seems to contradict the certification schemes’ codes of conduct.

**Leakage and accountability**

The focus group discussions and in-depth interviews touched on an issue discussed in the literature as a threat to certification programs – certified beans being sold as conventional beans (i.e., leakage) (Basso et al. 2012). The focus group discussions revealed that farmers often sold beans produced for certification as conventional largely because of their relationships with other LBCs apart from the one they are certified with and that is designated to buy certified beans in their community. Some participants shared how sometimes the purchasing clerks of the designated (certified) LBCs did not have money to pay for beans and that therefore they sold their beans elsewhere as conventional cocoa beans. The problem of leakage is described as an example
of certification schemes not necessarily working (Basso et al. 2012; Mahrizal et al. 2012; TCC 2015). It seems that farmers prior to joining certification had LBCs they sold their beans to for reasons including family and other relationships and access to informal credit (Anang 2011).

Participants in the focus groups and in-depth interviews made the point that price premiums were often presented to farmers as the major motivation for certification. However, it appears that certified farmers do not always receive price premiums because at times they sell their certified beans in conventional market channels. Therefore, it may be better to emphasize other benefits of participating in certification schemes such as lower input costs, increased productivity, and other support/benefits of certification (Basso et al. 2012; Gockowski et al. 2013; Ingram et al. 2014; Paschall and Seville 2012; TCC 2012).

There was also a strong sentiment expressed about the lack of frequent visits by certification officials to participant farms and communities. Farmers and officials expressed concern with lack of transparency and accountability on the part of lead farmers and some LBCs involved in cocoa certification schemes. One interviewee, a private consultant that conducts external auditing/inspection, put it as follows:

In my opinion, I think that most of these buying companies are into this program basically because of profit but not promoting sustainability of the program. Most of these licensed buying companies find it difficult in disclosing the cost incurred in preparing the grower groups so in terms of transparency, it has always been a problem for most of these licensed buying companies. Therefore, visibility has been a big problem (IN050301).

Cocoa farmer household survey results

The results of the household survey of cocoa growing farmers, both those participating and not participating in certification, are organized by five themes: inspections; farmer awareness of certification objectives; farmers agreement with group decision-making; certification requirements; and expected benefits of certification.

Inspections

The matter of internal as well as external inspections for certification that arose in the qualitative research was measured in the farmer household survey. Specifically, respondents were asked about the last time their farm was inspected by internal auditors (i.e., lead farmers from other certification groups) as well as by external auditors. As Table 2 shows, the certified farmers are not inspected as often as the cocoa certification programs call for. Roughly 41 percent of all certified cocoa farmers in our study report being inspected by an internal auditor within one year of certification program participation, while 31 percent of farmers in the study report never being inspected by an internal auditor. The
rate of external inspections reported was much lower. About 69 percent of certified cocoa farmers in our study area report never being inspected by external auditors during the last three or more years.

As Table 2 illustrates, we looked for differences in inspection frequencies across certification schemes (i.e., UTZ, FLO, and SAN-RA) as well as across implementation channels (i.e., LBC or Cooperatives). Both UTZ and SAN-RA participating cocoa farmers have slightly higher rates of internal inspections after three years than FLO cocoa farmers (59% and 69% versus 50%). Farmers participating in certification regimes using cooperatives are internally inspected at greater rates over a three-year period than cocoa farmers participating via LBCs (78% versus 46%). The frequency of external audits of participating cocoa farmers do not appear to be in line with the cocoa certification standards guidelines either. Both UTZ and FLO participating cocoa farmers have slightly higher rates of external inspections after three years than SAN-RA cocoa farmers (33% and 34% versus 21%). Farmers participating in certification regimes using cooperatives are externally inspected at lower rates over a three-year period than cocoa farmers participating via LBCs (19% versus 35%). Therefore, it seems that certification schemes implemented by LBCs have less internal but more external inspection as compared with certifications schemes implemented by cooperatives. These results suggest that internal and external inspections are simply not taking place as frequently as the various certification standards specify.

The survey results reveal that reliance simply on the qualitative data would have been misleading with regard to internal and external inspections for sustainable cocoa certification. While the focus groups and individual interviews revealed valuable information on how, by whom, and how often sustainable cocoa compliance inspections are supposed to take place, the survey data revealed that the stated expectations for inspections from are far from being realized on participating smallholder cocoa farms.

Table 2. Internal audit and external verification for compliance.

<table>
<thead>
<tr>
<th>Inspection</th>
<th>Certification Standard</th>
<th>Implementation Channel</th>
<th>χ²</th>
<th>χ²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UTZ</td>
<td>FLO</td>
<td>SAN-RA</td>
<td>LBC</td>
</tr>
<tr>
<td>Last time farmer was inspected by internal auditors</td>
<td>14***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within 1 year</td>
<td>49</td>
<td>43</td>
<td>42</td>
<td>38</td>
</tr>
<tr>
<td>Within 3 years but more than 1 year ago</td>
<td>10</td>
<td>7</td>
<td>27</td>
<td>8</td>
</tr>
<tr>
<td>More than 3 years ago</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Never</td>
<td>38</td>
<td>50</td>
<td>31</td>
<td>53</td>
</tr>
<tr>
<td>Last time farmer was inspected by external auditors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within 1 year</td>
<td>26</td>
<td>30</td>
<td>19</td>
<td>31</td>
</tr>
<tr>
<td>Within 3 years but more than 1 year ago</td>
<td>7</td>
<td>4</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>More than 3 years ago</td>
<td>67</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Never</td>
<td>0</td>
<td>66</td>
<td>79</td>
<td>65</td>
</tr>
<tr>
<td>N</td>
<td>47</td>
<td>53</td>
<td>50</td>
<td>150</td>
</tr>
</tbody>
</table>

*** ρ < 0.01, ** ρ < 0.05, * ρ < 0.1
Farmer awareness of certification objectives

Table 3 shows survey results on farmer awareness of cocoa certification objectives. Such awareness is important because of the requisite training farmers need before their farms can be inspected and verified for certification. The greater the gap in knowledge about certification elements and requirements, the more time needed for training farmers before initial inspections can be undertaken. As a result of their interest in certification and the training process, it was hypothesized that certified farmers evidence greater knowledge of certification program elements as compared to non-participating cocoa farmers in the community. The results, presented in Table 3, illustrate certified and non-certified farmers’ responses concerning their awareness of the eight main objectives of the organizations advocating cocoa certification. Almost all certified farmers reported being aware of the objective to improve farm output and income and a majority of them report being aware that certification is aimed at improving the working conditions of farm workers. However, fewer than half the certified farmers were aware of six of the eight objectives. While the general ranking of items with the highest awareness were similar comparing certified with uncertified farmers, certified farmers were more aware of most items. As Table 3 shows, five out of the eight principle certification program objectives have at least 20% of certified farmers in the sample reporting being aware of them while those objectives are known by only 10% or more of non-certified farmers in the region. Table 3 illustrates the significant differences in the magnitude of awareness of program objectives between certified cocoa farmers and non-certified cocoa farmers in our study. For example, the program objective that respondents report being most aware of is “improving farmers’ output and income” (93% of certified farmers versus 37% of non-certified farmers). The program objective that respondents indicated the next highest awareness measure was “improving working conditions of farm workers” (63% of certified farmers versus 38% of the non-certified farmers).

Table 3. Farmers’ awareness of the main objectives of cocoa certification.

<table>
<thead>
<tr>
<th>Main Objective</th>
<th>Certified Farmers (A)</th>
<th>Non-certified Farmers (B)</th>
<th>A – B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improving farmers output and income</td>
<td>93</td>
<td>37</td>
<td>56***</td>
</tr>
<tr>
<td>Improving working conditions of farm workers</td>
<td>63</td>
<td>38</td>
<td>25***</td>
</tr>
<tr>
<td>Conserving/protection natural resources</td>
<td>45</td>
<td>15</td>
<td>30***</td>
</tr>
<tr>
<td>Eliminating child labor</td>
<td>37</td>
<td>21</td>
<td>16**</td>
</tr>
<tr>
<td>Community infrastructure development</td>
<td>20</td>
<td>10</td>
<td>10**</td>
</tr>
<tr>
<td>Financial benefits of companies involved</td>
<td>5</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Improving access to inputs</td>
<td>4</td>
<td>5</td>
<td>–1</td>
</tr>
<tr>
<td>General farmer education</td>
<td>2</td>
<td>3</td>
<td>–1</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>150</td>
<td>162</td>
<td>312</td>
</tr>
</tbody>
</table>

*** p < 0.01, ** p < 0.05, * p < 0.1
These results make clear that there is significant room for improving the level of knowledge about cocoa certification programs for both certified and non-certified farmers in Ghana. While the results show that certified farmers may be more aware of the objectives of certification programs than non-certified farmers, the overall level of awareness of certification objectives is low for many objectives. Even among certified farmers, many of the respondents are not aware that issues like eliminating child labor (63%), conserving/protecting natural resources (55%), and community infrastructure development (80%) are objectives of the certification programs. This is especially concerning in light of the prominent role these objectives play in rhetoric and promotional materials for cocoa certification programs. Moreover, when asked to identify the certification standard that they were participating in (i.e. UTZ, FLO or SAN-RA), it was surprising that on average about 71% of certified farmers respondents did not know the name (either formal or colloquial) of the standards they are certified with.

Farmers’ agreement with group decision-making

The codes of conduct of three studied certification standards indicate that certified farmer groups are expected to be run based upon democratic principles. In simplest terms, this suggests that to a large extent, farmers participating in certified cocoa production should be engaged in their certified group’s decision-making. As was explained by participants in the in-depth interviews and focus group discussions, the hope is if farmers are appropriately engaged in their certified groups this will lead to increased commitment to the program and increased compliance with program requirements. Thus, household survey respondents were asked to indicate their level of involvement in group decisions as well as their level of agreement with group decisions using a five-point Likert scale: 1-strongly agree to 5-strongly disagree. Respondents were asked to indicate their level of (dis)agreement with decision-making participation and decisions regarding i) sale of certified beans and price premiums; ii) group meetings; iii) membership fees and payments; and iv) internal and external inspection. Table 4 presents the results on these items in two ways, in the first set of columns grouping respondents by the certification standard they participate in (UTZ, FLO, and SAN-RA) and the final set of columns grouping respondents by the implementation channel they use (LBC or farmer cooperative).

In general, farmers agree that they can be involved in group decisions, however respondents report greater ability to participate in decisions regarding group meetings and membership fees than they do with decisions about sales and price premiums and those about internal and external inspections. Looking to the impact, if any, of certification standard or implementation channel on respondents’ ability to be involved in decision-making, Table 4 shows that participants in FLO certification report greater ability to participate in decisions (except for those related to inspections), than respondents
who are members of the other two certification schemes. The implementation channel differences for the decision-making involvement items reveal significant differences between the two groups. Respondents working with LBCs report more involvement in decisions regarding sales and price premiums (1.8 versus 2.2) and less involvement in membership fees/payment decisions (1.8 versus 1.3). In all instances, it appears that farmers are less involved in decisions regarding internal and external inspections.

Focusing on respondents’ agreement with the group decisions, reported in the second set of rows in Table 4, we find that, in general, respondents report higher degrees of agreement with decisions made as compared to their ability to be involved in decision-making. The results in Table 4 show that respondent’s levels of agreement with group decisions indicate that across the certification standards and implementation channels farmers to a large extent agree with decisions. The only statistically different level of agreement either across certification standards or implementation channels for these four items was that respondents using the LBC implementation channel (1.4) more strongly agreed with decisions about group meetings than respondents using cooperatives as their implementation channel (1.7). These results indicate that respondents feel adequately engaged in their group decision-making and agree with their group’s decisions. That is, certified farmers are engaged in their groups and agree with group decisions (Table 4). It is noteworthy that the respondents’ lowest level of agreement with their involvement in decision-making and lowest level of agreement with decisions concern decisions regarding internal and external inspections.

**Table 4. Farmers’ level of agreement with decision-making in certified farmer groups.**

<table>
<thead>
<tr>
<th>Item</th>
<th>Certification Standard</th>
<th>Implementation Channel</th>
<th>χ²</th>
<th>LBC</th>
<th>Coop</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group members are able to be involved in decision-making regarding...</strong></td>
<td>UTZ</td>
<td>FLO</td>
<td>SAN-RA</td>
<td><strong>χ²</strong></td>
<td>LBC</td>
<td>Coop</td>
</tr>
<tr>
<td>Sale of certified beans and price premium</td>
<td>2.0</td>
<td>1.6</td>
<td>2.2</td>
<td>3.3</td>
<td>1.8</td>
<td>2.2</td>
</tr>
<tr>
<td>Group meetings (times, frequency, duration, location)</td>
<td>1.5</td>
<td>1.4</td>
<td>1.8</td>
<td>6.3**</td>
<td>1.6</td>
<td>1.7</td>
</tr>
<tr>
<td>Membership fees and payments</td>
<td>1.6</td>
<td>1.2</td>
<td>1.8</td>
<td>12.5**</td>
<td>1.8</td>
<td>1.3</td>
</tr>
<tr>
<td>Internal and external inspection</td>
<td>2.0</td>
<td>2.4</td>
<td>2.8</td>
<td>11**</td>
<td>2.4</td>
<td>2.6</td>
</tr>
<tr>
<td><strong>Farmer agrees with group decisions regarding...</strong></td>
<td>UTZ</td>
<td>FLO</td>
<td>SAN-RA</td>
<td><strong>χ²</strong></td>
<td>LBC</td>
<td>Coop</td>
</tr>
<tr>
<td>Sale of certified beans and price premium</td>
<td>1.4</td>
<td>1.3</td>
<td>1.2</td>
<td>2</td>
<td>1.2</td>
<td>1.3</td>
</tr>
<tr>
<td>Group meetings (times, frequency, duration, location)</td>
<td>1.5</td>
<td>1.5</td>
<td>1.7</td>
<td>2.4</td>
<td>1.4</td>
<td>1.7</td>
</tr>
<tr>
<td>Membership fees and payments</td>
<td>1.3</td>
<td>1.3</td>
<td>1.4</td>
<td>1.7</td>
<td>1.5</td>
<td>1.2</td>
</tr>
<tr>
<td>Internal and external inspection</td>
<td>1.8</td>
<td>2.0</td>
<td>1.8</td>
<td>0.01</td>
<td>1.9</td>
<td>1.7</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>47</td>
<td>53</td>
<td>48</td>
<td>148</td>
<td>73</td>
<td>71</td>
</tr>
</tbody>
</table>

LBC—Licensed Buying Company; Coop—Farmer Cooperative; *** p < 0.01, ** p < 0.05, * p < 0.1
The focus groups and individual interviews suggested that cocoa farmer groups participating in sustainability certification are supposed to operate under democratic principles, emphasize transparency, and work to build capacity and promote compliance. Similarly, the qualitative data suggested that cooperative farmer groups would have stronger leadership and bargaining power as compared to LBC farmer groups. The survey results show farmers reporting significantly greater agreement with LBC groups decisions concerning sale of certified beans and price premium as compared to cooperative group decisions. While survey respondents agree more with cooperative groups’ decision making about membership fees and payments as compared to LBC farmer groups. The qualitative data also suggested that price premium distribution depends on the type of certified farm groups. The survey results that more respondents agree with decisions involving sale of certified beans and price premiums made by LBC farmer groups rather than cooperative farmer groups suggest price premium benefits for LBC farmer groups that were not suggested by the focus groups and individual interviews. At the same time, we learned a great deal about the issue of leakage (selling certified bean as ‘regular’ cocoa bean in traditional market channels) in the focus groups and individual interviews that would not have been captured by the household survey.

**Certification requirements**

The household survey examined certified and non-certified farmers’ level of agreement with certification program requirements (see Table 5). Respondents were asked to indicate their level of agreement (using a 5-point scale) with nine certification requirements. The initial education by promoters of certification in a community is open to all farmers in a community and provides information on the program requirements. The results indicate that certified farmers agree to a greater extent with all nine of the presented certification requirements (i.e., all rating are

<table>
<thead>
<tr>
<th>Item</th>
<th>Certified (A)</th>
<th>Non-certified (B)</th>
<th>A – B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmer agrees with certification requirement for...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farmer organization</td>
<td>1.3 (0.07)</td>
<td>1.9 (0.12)</td>
<td>0.6***</td>
</tr>
<tr>
<td>Farm establishment and rehabilitation</td>
<td>1.2 (0.05)</td>
<td>1.6 (0.08)</td>
<td>-0.4***</td>
</tr>
<tr>
<td>Workers’ right, including child and informal labor</td>
<td>1.3 (0.06)</td>
<td>1.7 (0.09)</td>
<td>-0.4**</td>
</tr>
<tr>
<td>Farm management and maintenance</td>
<td>1.2 (0.04)</td>
<td>1.5 (0.06)</td>
<td>-0.3***</td>
</tr>
<tr>
<td>Soil management, fertilization, and pest management</td>
<td>1.2 (0.03)</td>
<td>1.5 (0.08)</td>
<td>-0.3***</td>
</tr>
<tr>
<td>Harvest and post-harvest practices</td>
<td>1.3 (0.06)</td>
<td>1.6 (0.07)</td>
<td>-0.3**</td>
</tr>
<tr>
<td>Safety, and healthy farm practices</td>
<td>1.1 (0.02)</td>
<td>1.3 (0.05)</td>
<td>-0.2***</td>
</tr>
<tr>
<td>Waste management</td>
<td>1.1 (0.03)</td>
<td>1.4 (0.06)</td>
<td>-0.3***</td>
</tr>
<tr>
<td>Environmental and natural resource protection</td>
<td>1.3 (0.06)</td>
<td>1.4 (0.06)</td>
<td>-0.1</td>
</tr>
</tbody>
</table>

N = 150 160 310

*** p < 0.01, ** p < 0.05, * p < 0.1
less than 1.35 and range from 1.1 to 1.3) as compared to the ratings of certification requirements by non-certified farmers (i.e., rating higher than 1.25, range from 1.3 to 1.9). Results show that these two groups of respondents differ significantly in their level of agreement with the requirements for farmer organization. That is not a surprise given that non-certified farm respondents have chosen to not participate in the certification programing their community. It seems that the requirement to organize into farmer organizations is the least acceptable to this group, followed by some opposition to requirements for workers’ rights which includes child and informal labor. However, both groups have average agreement scores above the somewhat agree category revealing an average agreement with all certification requirements by both groups.

**Expected benefits of certification**

The certification programs are promoted as mechanisms that will result in benefits to participating cocoa farmers and their communities. We asked respondents (both certified and non-certified cocoa farmers) to rate using a 5-point Likert scale their level of agreement/disagreement with their expectation of eleven (11) stated benefits associated with certification as well as their belief that the certification program has resulted in those benefits. The results are presented in Table 6, where the first set of columns reports on expected benefits and the second set of columns reports realized benefits.

Respondents indicated that improved farm management, improved market access, improved safety and healthy farm practices and increased farm output were at the top of their list of expected benefits (ratings 1.8 to 1.9). While these items were also highly rated by non-certified farmers, in all cases the non-certified farmers rated these items significantly less positively that certified farmers (2.3 to 2.4). Overall, even though certified farmers ratings show slightly more agreement, there is correlation, both simple and ranked correlation, between ratings for expected benefits for certified and uncertified farmers. The certified farmers generally agreed that they expected certification to be beneficial for eight (8) of the eleven (11) items (rankings < 2.5), while non-certified farmer reported that they did not anticipate certification to have big benefits with their more neutral ratings for the eleven items.

When asked about their current beliefs about benefits derived from certification programs, the results show more variability among and between certified and non-certified farmers’ responses. The results show that both certified and non-certified farmers generally agree that certification has been beneficial with regards to many of the specified items. Notably, improved awareness of environmental conditions and protection (1.4, 1.5), improved farm management (1.4, 1.6), and improved market access (1.4, 1.5) were
Table 6. Farmers’ assessment of expected benefits of certification (1 – strongly agree to 5 – strongly disagree).

<table>
<thead>
<tr>
<th>Item</th>
<th>Certified (A)</th>
<th>Non-Certified (B)</th>
<th>A-B</th>
<th>sig</th>
<th>Farmer expected certification to…</th>
<th>Rating (Linearized Std. Err.)</th>
<th>Certified (A)</th>
<th>Non-Certified (B)</th>
<th>A-B</th>
<th>sig</th>
<th>Farmer believes certification has…</th>
<th>Rating (Linearized Std. Err.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve(d) farm management</td>
<td>1.8 (0.11)</td>
<td>2.4 (0.18)</td>
<td>−0.6</td>
<td>**</td>
<td></td>
<td></td>
<td>1.4 (0.06)</td>
<td>1.6 (0.08)</td>
<td>−0.2</td>
<td>***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve(d) market access</td>
<td>1.9 (0.13)</td>
<td>2.5 (0.19)</td>
<td>−0.6</td>
<td>**</td>
<td></td>
<td></td>
<td>1.4 (0.06)</td>
<td>1.5 (0.09)</td>
<td>−0.1</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve(d) knowledge of safety &amp; healthy farm practices</td>
<td>1.9 (0.14)</td>
<td>2.4 (0.19)</td>
<td>−0.5</td>
<td>**</td>
<td></td>
<td></td>
<td>1.5 (0.08)</td>
<td>2.0 (0.12)</td>
<td>−0.5</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase(d) farm output</td>
<td>1.8 (0.12)</td>
<td>2.3 (0.18)</td>
<td>−0.5</td>
<td>**</td>
<td></td>
<td></td>
<td>1.5 (0.06)</td>
<td>1.9 (0.12)</td>
<td>−0.4</td>
<td>***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve(d) labor rights (including workers and children)</td>
<td>2.1 (0.14)</td>
<td>2.6 (0.19)</td>
<td>−0.5</td>
<td>**</td>
<td></td>
<td></td>
<td>1.6 (0.07)</td>
<td>2.1 (0.14)</td>
<td>−0.5</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase(d) farm income (price premiums)</td>
<td>2.4 (0.14)</td>
<td>2.8 (0.19)</td>
<td>−0.4</td>
<td>*</td>
<td></td>
<td></td>
<td>1.9 (0.08)</td>
<td>2.4 (0.19)</td>
<td>−0.5</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve(d) access to inputs</td>
<td>2.0 (0.11)</td>
<td>2.4 (0.15)</td>
<td>−0.4</td>
<td>**</td>
<td></td>
<td></td>
<td>2.3 (0.11)</td>
<td>2.5 (0.16)</td>
<td>−0.2</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Give(n) access to credit/financial assistance</td>
<td>2.8 (0.15)</td>
<td>3.0 (0.20)</td>
<td>−0.2</td>
<td></td>
<td></td>
<td></td>
<td>4.5 (0.08)</td>
<td>4.2 (0.19)</td>
<td>0.3</td>
<td>*</td>
<td></td>
<td></td>
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<tr>
<td>Improve(d) awareness of envir. conditions and protection</td>
<td>2.1 (0.14)</td>
<td>2.4 (0.19)</td>
<td>−0.3</td>
<td>*</td>
<td></td>
<td></td>
<td>1.4 (0.05)</td>
<td>1.5 (0.07)</td>
<td>−0.1</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Bring/Brought community infrastructure development</td>
<td>3.2 (0.16)</td>
<td>3.1 (0.20)</td>
<td>0.1</td>
<td></td>
<td></td>
<td></td>
<td>4.5 (0.09)</td>
<td>4.2 (0.18)</td>
<td>0.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve(d) access to extension services</td>
<td>2.8 (0.16)</td>
<td>2.9 (0.20)</td>
<td>−0.1</td>
<td></td>
<td></td>
<td></td>
<td>3.2 (0.11)</td>
<td>3.4 (0.15)</td>
<td>−0.2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N                      150    160    310    150    160    310

*** p < 0.01, ** p < 0.05, * p < 0.1
rated most highly as benefits believed to have resulted from participation in the certification programs. At the other end of the spectrum of responses, it appears that both certified and non-certified farmers show less agreement that certification has resulted in improved access to inputs (2.3, 2.5), and do not believe that certification has resulted in improved access to credit/financial assistance (4.5, 4.2), community infrastructure development (4.5, 4.2), or improved access to extension services (3.2, 3.4). Overall, even though certified farmers ratings show slightly more agreement, there is significant correlation between certified and uncertified farmer’s ratings for the resulting benefits of certification.

It is possible that divergences between cocoa farmers’ expected benefits and realized benefits from certification program participation could increase dissatisfaction and possibly lead to discontinued participation in sustainable cocoa certification programs. However, the results (see Table 6) reveal that for the expected benefits that respondents strongly agreed they expected from certification programs (e.g., improved farm management), respondents also strongly agreed that certification programs delivered them – often more than expected. A few possible program benefits were deemed to be realized at substantially lower rates than expected (e.g., access to credit; community benefits), though farmers were close to neutral about whether or not they expected these from the certification program. For example, certified farmers disagreed that they expected certification would bring infrastructure development to the community (3.2 on a 5-point scale) while they more strongly disagreed with the assertion that certification has bought in community development (4.5 out of 5). While the benefits being realized at much lower rate than expected were ones that were not highly expected, it is notable that the four areas with the largest improvements between expected benefits and realized benefits are all cornerstones of these certification programs: market access, farm income, environmental awareness and labor rights.

**Conclusion**

Efforts to understand and enhance the impacts of third-party certification for smallholder producers would benefit from closer examinations of the structures and procedures for implementing certification programs as well as better understanding of how farmers perceive those structures and procedures. Beneficial outcomes of certification for participating farmers and their agro-ecosystems are based on the premise that farmers adopt and maintain required practices. Since previous studies and impact assessments of certification programs were short of conclusive, we sought to shed light on how cocoa certification works in practice and is perceived by smallholder producers in Ghana.
Our findings reveal that certified smallholder farmers are not inspected as often as the several certification programs specify. Moreover, we found that sustainable cocoa certification programs in which participating farmers rely on LBCs as their intermediaries have fewer internal inspections but more external inspections as compared to the cocoa certification programs that have farmers relying on farmer cooperatives as their intermediaries. In any event, it appears that inspections are less than 50% of the expected levels. In the absence of inspections and verification of participating farmers and their production processes, it is possible that farmers may not properly adopt or maintain practices that generate the program’s desired agro-ecological and other benefits. In turn, if consumers learn that they are paying ‘sustainable certified’ price premiums for partial compliance, they may lose trust in such programs and stop buying certified products (i.e., price premiums) thereby bringing an end to such programs. Unless future research can demonstrate that the less than expected inspection frequencies are sufficient to ensure ecological benefits and price premiums, our findings suggest that increased regular inspections are needed.

We also found that smallholder cocoa farmers, across the board, are not aware of most certification program objectives. Not surprisingly, we found certified farmers to be more aware of certification elements and objectives than uncertified farmers. Participants’ general lack of awareness of certification program objectives is of concern because it could threaten sustainability to the extent that unaware farmers may not know what they are supposed to do, what additional steps they are supposed to take, or may not think that additional measures/actions matter and should continue to be undertaken. Along these lines, we also quantified the extent to which smallholder cocoa farmers agreed with various certification requirements. As with awareness of objectives, we were motivated by a concern that widespread lack of agreement with all or some requirements could motivate some farmers to exit certification or undermine adherence to requirements ensuring sustainability elements of certification. However, our findings reveal smallholder cocoa farmers expressed broad agreement with sustainable certification program requirements. Thus, it seems that being broadly unaware of sustainable cocoa program objectives does not undermine farmers’ agreement with program requirements and this unawareness appears unlikely to impede actual pro-environmental behavior.

The cocoa certification programs we examined were implemented at the group level. We assessed levels of agreement with group decision making because disagreements over decisions have the potential to be another avenue threatening continued program participation or adherence to program requirements. We found that certified farmers were engaged in their groups and were in general agreement with their farmer group decisions. Thus, it appears that the current levels of agreement/disagreement of respondent farmers with their certification group decisions are not a source of farmer
discontent and do not currently appear to be a reason that farmers might leave the certification program.

We also assessed smallholder cocoa farmers’ expected benefits from participation in certification as well as their assessment of the benefits they realized with certification. We posited that divergences between cocoa farmers’ expected and realized benefits might increase individual dissatisfaction and possibly undermine sustainability. However, our results show that, for most dimensions assessed, farmers realized greater benefits than expected. Areas where farmers agreed that certification resulted in expected and realized benefits include farm income, farm management, market access, labor rights, and awareness of environmental conditions and protection — all critical elements of sustainability per these certification programs. Importantly, expectations were exceeded by their realizations for all the most expected benefits of certification and for 7 of the 11 elements overall. Thus, from the perspective of farmers, the programs appear to be delivering on key programmatic benefits more than expected, which bodes well for sustained participation.

We studied non-participating cocoa farmers to understand their perspectives on cocoa sustainability certification because non-participants often have different perspectives which may influence participation and consequently affect the social and environmental sustainability achieved from certification. We found statistically significant differences between participants and non-participants in almost all items tested; nonparticipants were less aware of objectives, in less agreement with requirements, and perceived lower expected benefits from certification. Despite these differences, patterns in responses were strikingly similar for participants and nonparticipants. Both knew the most about the objectives for farmer income and farm worker’s working conditions; both generally agreed with all certification requirements; and both perceived that the actual outcomes of certification exceeded expectations for most elements including for farm incomes. Thus, our survey of non-participants did not reveal critical perception differences that explain their non-participation or that might significantly hinder participation.

At the heart of viable and robust third-party certification is a need to bridge the information gap between consumers and producers as well as a need to be transparent in verifying certification compliance and delivering adequate and timely price premiums and programmatic support. Farmers need to be adequately educated, organized, and incentivized to adopt and maintain sustainable practices. Price premiums and market access cannot be taken for granted. Stakeholders in certification implementation can advance their objectives by involving farmers in the management of price premiums. Even with adequately informed and highly motivated farmers, compliance verification should be emphasized. Inadequate compliance verification could undermine the goals of certification and jeopardize price premiums. The circumstances of smallholder producers present some logistical and other challenges to compliance verification. However, effective
compliance verification does not require expensive and cumbersome procedures and tools and therefore innovative approaches to increase compliance verification seem in order. Understanding how smallholder farmers and stakeholders in certification programs perceive program requirements and actually behave, we believe, are instructive for the design and implementation of more robust sustainable third-party certification programs. Our practical results on how certification works in the field and farmer perceptions of certification suggest the benefits of future research on the implementation of certification schemes in different contexts including alternative implementation mechanisms.

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**References**


Laven, Anna & Boomsma, M. 2012. Incentives for sustainable cocoa production in Ghana: moving from maximizing outputs to optimizing performance. Tropical Commodity Coalition [TCC].


Appendices

Appendix A. Sampling framework

<table>
<thead>
<tr>
<th>Certification Standard/ Implementation Channel</th>
<th>Districts</th>
<th>Communities in Selected District</th>
<th>Certified</th>
<th>Non-certified</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTZ/LBC</td>
<td>22</td>
<td>21</td>
<td>44</td>
<td>100</td>
</tr>
<tr>
<td>UTZ/Farmer Cooperative</td>
<td>2</td>
<td>8</td>
<td>22</td>
<td>59</td>
</tr>
<tr>
<td>FLO/LBC</td>
<td>1</td>
<td>29</td>
<td>62</td>
<td>168</td>
</tr>
<tr>
<td>FLO/Farmer Cooperative</td>
<td>7</td>
<td>34</td>
<td>37</td>
<td>117</td>
</tr>
<tr>
<td>SAN-RA/LBC</td>
<td>4</td>
<td>22</td>
<td>58</td>
<td>118</td>
</tr>
<tr>
<td>SAN-RA/Farmer Cooperative</td>
<td>3</td>
<td>34</td>
<td>80</td>
<td>390</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>39</strong></td>
<td><strong>148</strong></td>
<td><strong>303</strong></td>
<td><strong>952</strong></td>
</tr>
</tbody>
</table>

UTZ = UTZ Certified  
FLO = Fair Trade Labeling Organization  
SAN-RA = Sustainable Agriculture Network-Rainforest Alliance  
LBC = licensed buying company

Appendix B. Location of study communities

[Cocoa is only produced in the Southern part of Ghana]
Appendix C. Details of probability weight calculation

The total number of cocoa farming households enumerated (column 2) was known for each community as well as certified and non-certified households. Minor errors in the classification of households during enumeration were tracked and corrected for (column 3); for example, some small percentage of household identified in enumeration as certified may turn out to be uncertified in the longer household survey interview. The corrected populations were used to obtain population proportions (column 4) for certified and non-certified households. The proportions (column 6) of certified and non-certified households in the sample were also calculated with information from the survey data. Weights (column 7) were then obtained as a ratio of population proportions to sample proportions.

Table C.1. Details of Probability Weight Calculation.

<table>
<thead>
<tr>
<th>Household Type</th>
<th>Enumerated Population</th>
<th>Corrected Population</th>
<th>Population Proportion</th>
<th>Survey Sample</th>
<th>Sample Proportion</th>
<th>Weight</th>
</tr>
</thead>
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<tr>
<td>Certified</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Community 0103</td>
<td>44</td>
<td>43.694</td>
<td>0.035</td>
<td>26</td>
<td>0.083</td>
<td>0.418</td>
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<tr>
<td>Community 0107</td>
<td>22</td>
<td>21.885</td>
<td>0.017</td>
<td>21</td>
<td>0.067</td>
<td>0.259</td>
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<td>Community 0203</td>
<td>62</td>
<td>61.683</td>
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<td>0.087</td>
<td>0.568</td>
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<td>Community 0207</td>
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<td>36.881</td>
<td>0.029</td>
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<td>0.550</td>
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<td>24</td>
<td>0.077</td>
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<td>Non-Certified</td>
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<td></td>
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<td>26</td>
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<td>117.119</td>
<td>0.093</td>
<td>27</td>
<td>0.087</td>
<td>1.078</td>
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