FEED THE FUTURE
The U.S. Government's Global Hunger & Food Security Initiative

Private Sector Consultation on Climate Smart Agriculture

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The Feed the Future Learning Community for Supply Chain Resilience

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Executive Summary

Smallholder farmers around the globe are facing unstable productivity due to changing climate and weather patterns. The ways in which the private sector supports these farmers to build resilience to climate change and/or engage in efforts to mitigate climate change can have significant impact on the ability for farmers to make a living, the security of supply of smallholder crops, and the reputation of the private sector actors drawing loyalty of end consumers and investors.

As part of an effort to better engage the private sector in climate smart agriculture activities the Learning Community for Supply Chain Resilience, funded by USAID's Feed the Future program and in support of the Alliance for Resilient Coffee (ARC), interviewed 18 coffee companies to better understand how they think about climate risk and climate smart agriculture, the types of activities in which they engage, and the types of climate information they use and/or need[1]. The results of this study are supplemented by results from a case study of Ugandan coffee companies, illustrating how their use of and need for climate information differs at the national level. The results give insight into the types of information that private sector companies are looking for to be able to design and implement effective climate smart agriculture programs. It also yields some insight on information and tools that would facilitate sector-level strategies.

While all of the companies interviewed are engaged in sustainable agriculture activities, there is confusion in the sector about the definition of "climate smart agriculture" and which activities fall under that category rather than the broader "sustainability" category. Companies that worked closely with farmers, tended to not separate efforts into climate or sustainability efforts, but rather focused on holistic programs to increase productivity and make farming a viable option for today's farmers and an attractive option for the next generation.

Companies in the study used a variety of types of climate information depending on their needs, which were seen to have more relation to their distance to smallholder farmers rather than position in the supply chain as a trader or roaster. The proximity to farm level along with results on drivers for decision-making, motivations for investing in climate smart practices (focus on security of supply or brand reputation) and influencers (integration of sustainability staff with procurement/sourcing or strong company values) all informed our categorization of different types of companies. For this paper, we are using three categories of (i) "direct service providers" (those providing integrated services to smallholder farmers), (ii) "collaborators" (those working with direct service providers to support work with smallholder farmers), and (iii) "catalysts" those working at global, sector or policy level on climate issues with a light touch at the farm level. These categories are intended to serve as general guideposts as the Alliance for Resilient Coffee and other partners develop and tailor tools and analyses for different audiences.

Companies working closest to smallholder farmers (*direct service providers*) had the most access to and need for detailed farm-level data, and are looking for more local information to supplement

[1] Information on two other coffee companies (ECOM and Starbucks) is incorporated into the report from earlier conversations with the companies, but as they were not asked the same questions through the Interview Guide, they are not included in the more quantitative results (such as charts and statistics). Three companies were unable to be reached to gain approval for this report. As such, the company names are omitted.

their knowledge, such as changing local weather patterns, site-specific good agricultural practices (GAPs) and recommendations for adaptation practices for particular climate hazards.

Those working with the *direct service providers* (the *collaborators*) depend on the *direct service providers* for information to shape their program design and implementation. These companies often work in collaborations at a slightly higher level, looking to area-specific climate maps and case studies on successful programming to inform a broader strategy.

Those furthest from the farm level, (the *catalysts*) rely on secondary sources of information from sector groups, such as backbone organizations and trade groups, as well as suppliers and desk research to answer particular questions and develop strategy.

Although differing depending on their role in the supply chain, there were several types of information that many of the companies were interested in using and felt were missing to make decisions about climate smart activities. These included (i) quality, site-specific information for improved diagnostics, (ii) information to help measure and manage climate risk and (iii) information related to specific, practical technologies to build resilience. There was also a common call from all companies for easier access to quality, digestible information and fewer long, academic papers that are hard to find the time to read.

One of the key findings of this study is that in order to successfully approach companies and tailor tools and resources to their needs, tool/resource developers need to understand the role of climate smart agriculture within their business model and sustainability strategy, their motivations for investing in climate smart agriculture and the types of tools and resources that would most benefit them.

This study is a deep dive into the drivers for climate investments by a subset of global coffee companies and as such not a comprehensive, definitive picture of the state of the entire industry. However, through conversations with the first mover companies, it is clear that climate change is a recognized and present issue with all companies regardless of position in the value chain. There was no reticence or denial of the severity of the threat nor a lack of recognition of the potential impact to companies' bottom line from climate change among those interviewed. There was rather an almost universal engagement and enthusiasm that the sector – companies, farmers, government, donors, research, NGOs – must tackle this threat together and act fast. There was a sense of urgency and even impatience from some that the strategies and programs must be better coordinated, informed by credible science and rigorously practical for farmers' realities. With access to the right information in the right format, coffee companies will be more likely to utilize tools and resources to make informed decisions in the face of climate change.

The Learning Community for Supply Chain Resilience and the Alliance for Resilient Coffee: Feed the Future initiatives

Smallholders in emerging economies are crucial to global agriculture and an increasing focus of many private sector efforts. These farmers face severe threats to their livelihoods from changing weather and climate patterns, and companies face related threats to their supply security. Companies are increasingly making commitments around climate change mitigation, climate change adaptation, livelihoods, water and deforestation. Private sector engagement in building climate resilience could provide breakthrough solutions if the enabling conditions are well coordinated.

Climate change resilience has three key pillars: productivity, adaptation, and mitigation. To put in place a "climate smart" program or strategy, companies may act on any of these variables.[2] Many companies recognize the strategic importance of investing in farmers and climate-resilient supply chains and a number of 'first mover' companies have endorsed this concept through the World Business Council for Sustainable Development, the Cool Farm Alliance, or the Global Alliance for Climate Smart Agriculture. The coffee sector has aligned around a number of global initiatives to better harness the sector's resources and coordinate efforts, including the Initiative for coffee&climate (c&c), the Global Coffee Platform (GCP), the Sustainable Coffee Challenge (SCC) and the network of World Coffee Research (WCR). While the activities of these broad platforms are not limited to building smallholder climate change resilience, core activities of each aim to contribute part of the solution.

USAID's Feed the Future program has funded three linked initiatives focused on increasing private sector engagement in smallholder resilience: The Learning Community for Supply Chain Resilience[3], the Climate Smart Cocoa Initiative, and the Alliance for Resilient Coffee (ARC). The Learning Community was tasked with analysis of and consultation with a range of food, beverage and agriculture companies, to provide these consortiums with an overview of private sector commitments, approaches, and needs regarding climate smart agriculture so that members could tailor tools and resources to the private sector.

How to Read this Report

This report focuses on the results of consultation with coffee companies and is focused on delivering these results into the ARC consortium. There are three main elements that help to determine what types of tools and resources the private sector needs, reflected in the report's three sections: (i) Current Programs, Initiatives, and Roadblocks; (ii) Demand and Use of Climate Change Information; and (iii) Drivers for Decision-Making.

1. Current Programs, Initiatives and Roadblocks

This section gives an overview of the types of activities that the coffee companies interviewed are focused on and involved in. All of the companies interviewed were involved in climate smart initiatives in some regard or another. However, for some it is more of a stand-alone issue, while others see it very much integrated into a broader sustainability effort from which it cannot be

[2] See FAO's definition on climate smart agriculture for more information: http://www.fao.org/climate-smart-agriculture/en/

[3] Formerly known as "The Learning Community for Private Investment in Climate Smart Agriculture"

separated. The section also covers perceived "roadblocks" or challenges to implementing climate smart agriculture programs. *Together, the activities and roadblocks provide insights to the ARC consortium into the types of tools or resources that could be used as a support to current activities or as a solution to challenges faced by the companies in implementing effective strategies or initiatives.*

2. Demand and Use of Climate Change Information

In order to make better strategic decisions companies are looking for relevant information that is easier to access, quickly digest and use. This chapter illustrates the different types of climate information companies are using, where they see the gaps, and in what format they would most likely access and use tools and resources. *This section gives detailed insight into the type of information and tools companies are looking for and what formats are most appealing for use so that consortium members can tailor information and tools to the private sector's needs.*

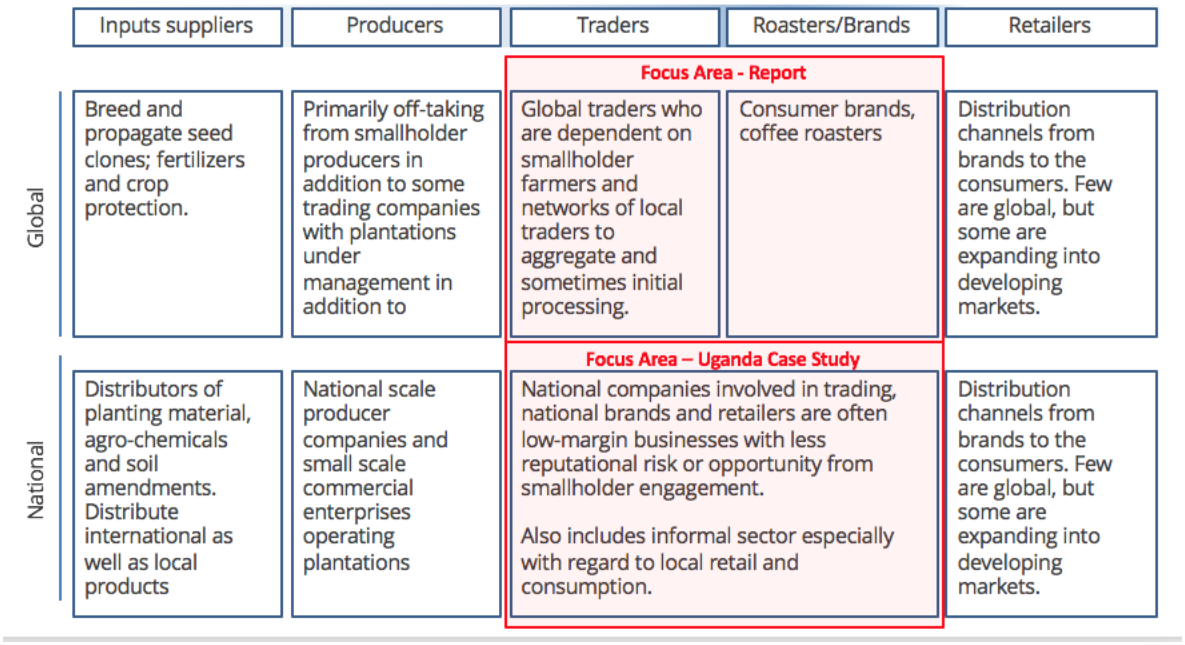
3. Drivers for Decision-Making

The private sector has a range of different priorities for engaging in climate smart agriculture. Corporate priorities are generally reflected in the company's processes, influencers and decision-making strategies. In this section, we discuss the range of corporate priorities for engagement (from securing a sustainable supply to minding brand reputation), how that is reflected by the position of the sustainability department (embedded within operations or not) and who are the main influencers of the CSA and sustainability strategies. *This section gives insight into how different types of companies view climate change in coffee, which will help the ARC consortium members determine how to approach and work with different companies as well as what types of tools and resources they will find most helpful.*

Description of companies and categorizations

The Learning Community team built on the interviews conducted by the Sustainable Coffee Challenge, Global Coffee Platform and the Specialty Coffee Association for the 2016 Coffee Sustainability Catalogue[4]. We reviewed reported data from the Catalogue interviews and did not repeat questions / results that had already been generated. Interviews were conducted with one to two representatives each from each of the coffee companies. Interviews were focused on traders and roasters to reach those who are most likely to adopt and implement the tools created by the ARC consortium, and therefore to make the biggest impact in improving or increasing the uptake of climate smart agriculture activities. The Ugandan case study offers insight into the traders and roasters at the national level and how their use of and need for climate change information differ.

[4] See: http://www.conservation.org/publications/Documents/Coffee_Sustainability_Catalogue_2016_FULL_with_appendices.pdf



Company Name	Role	Description/Key points
Cooperative Coffees	Direct Service Provider	Cooperative Coffees ("Coop Coffees") is a consortium of 23 roasters across the United States partnering directly with small-scale coffee farmers and their exporting cooperatives. Publicly committed to sourcing sustainably grown coffees and partnering closely with coffee farmer partners. Member roasters help producers build capacity through proactive communication, financial and technical assistance, market information and dialogue. Members are expected to buy the majority of their coffee through the coop and take an active role in the governance and well-being of Coop Coffees. For more information see: https://coopcoffees.coop/
Ecom	Direct Service Provider	ECOM Agroindustrial Corp. Ltd is a leading global commodity merchant and sustainable supply chain management company. As an origin-integrated business operating in over 40 major producing countries worldwide, ECOM focuses primarily on coffee, cotton, and cocoa, as well as participating in selected other agricultural product markets. Its global operations rely on its extensive knowledge and experience in supply chain improvement, risk management and client focused distribution to create a valuable and profitable environment for suppliers, customers, shareholders and employees. For more information see: http://www.ecomtrading.com/
EFICO	Direct Service Provider (Catalyst)	Based in Antwerp, Belgium, EFICO trades green coffee. As a medium-sized coffee trader EFICO upholds the values of a long-standing family business, committing to the UN Global Compact Code and striving to support the Sustainable Development Goals. The EFICO Group also counts with its own foundation supporting projects, improving livelihoods and farming practices of coffee communities. For further information see www.efico.com/home.
Farmer Brothers	Direct Service Provider (Collaborator)	Founded in 1912, today Farmer Brothers has over 110 branches in the United States and is a national roaster, manufacturer, wholesaler and distributor of high-quality branded and private label coffees, teas, spices and culinary

		products to foodservice, convenience stores and grocery retailers. Their Direct Trade Verified Sustainable (DTVS) program helps them to assess community needs and lead farmers to make community-led decisions for programs to address those needs. They are a founding member of World Coffee Research (WCR) and partner with several organizations and platforms to promote sustainable practices. Farmer Brothers releases a Sustainability Report detailing their activities. For more information see: http://www.farmerbros.com/
JDE	Collaborator	JDE is a fairly young company after the merge of the coffee businesses of Douwe Egberts Master Blenders 1753 (DEMB) and Mondelēz (Jacobs) in 2015. DEMB had its own foundation coordinating and sponsoring sustainability programs in origin, which included some climate specific projects (such as the Coffee Climate Care – c^3 – project in Vietnam), while Mondelēz was working on sustainability issues through their Coffee Made Happy Program mainly delivered through suppliers and with a strong focus on good agricultural practices. After the merger, JDE took on the running projects and programs for finalization and at the same time worked on their own sustainability strategy. For more information see: https://www.jacobsdouweegberts.com/
Keurig Green Mountain	Collaborator	Keurig Green Mountain was born from a merger of Green Mountain Coffee Roasters and Keurig, Inc. resulting in a specialty coffee company utilizing single serve brewing systems. Keurig is committed to using the power of business to "brew a better world" through their work to build resilient supply chains, sustainable products, and thriving communities. They are a global business, sourcing from farms in the coffee bean belt around the world and making brew systems in factories across Asia and Europe. For more information see: http://www.keuriggreenmountain.com/
Lavazza	Catalyst	Luigi Lavazza founded Lavazza in 1895 in Turin, Italy. With a focus on espresso the family business today counts as one of the most important roasters worldwide. Sustainability is considered an issue in the countries Lavazza sources from as well as in the consuming countries. In 2015 the company achieved a turnover of over € 1.473 billion with over 3000 employees. For further information see www.lavazza.com.
Nestlé	Collaborator	Nestlé is the world's largest food and beverage company, with more than 2000 brands and present in 191 countries around the world. Most of Nestlé's Nescafe coffee is sourced from smallholder farmers, to whom Nestle provides support through a network of agronomists and coffee-experts. Nescafe also utilizes Life Cycle Assessments to determine the environmental impact at every stage of the product process. For more information see: http://www.nestle.com/
Olam International	Direct Service Provider (Collaborator)	Olam is a leading agri-business operating from seed to shelf in 70 countries, supplying food and industrial raw materials to over 23,000 customers worldwide. They grow, source, process, manufacture, transport, trade and market 47 different agri-products. Olam is committed to responsible growth. We ensure profitable growth is achieved in an ethical, socially responsible and environmentally sustainable manner. For more information see: http://olamgroup.com/
Paulig	Catalyst	Paulig is a family-owned, international enterprise in the food industry that is noted for its high-quality brands and services. The company's key divisions are Coffee, World Foods & Flavouring, Snack Food and Naturally Healthy Food. Our brands are Paulig, Santa Maria, Risenta, Gold&Green and Poco Loco. Paulig has 1,900 employees in 13 countries and its net sales were EUR 917 million in 2016.

		Commitment to high quality, a long-term view and a sense of responsibility have been Paulig Group's core values since 1876 when Gustav Paulig founded the company. For more information see: www.pauliggroup.com
S&D	Collaborator	Roy Davis Sr. and Lawrence Switzer founded S&D Coffee in 1927. Backed by a team of industry veterans, S&D constantly pursues the finest raw materials and connects with the entire supply chain from farmers to operators. S&D Coffee is a leader in natural extracts and concentrates from coffee, tea and botanicals and is the largest, custom coffee manufacturer of its type within North America. For more information see: http://www.sdcoffeetea.com/
Strauss Coffee	Catalyst	Strauss coffee is an international corporation with a portfolio of around 10 companies dealing with coffee, it is a subsidiary of Strauss Group, an Israeli public company. Headquartered in Amsterdam, Strauss Coffee employs local management teams to build strong local brands and support them with a centralized structure. This includes a centralized purchasing center for green coffee is based in Switzerland and some operations in Vietnam, a significant coffee growing region. Over the past decade, Strauss Coffee B.V. has grown to become one of the top 10 global coffee players in terms of green coffee procurement and one of the fastest growing branded coffee companies in the world. For more information see: https://www.strausscoffee.com/about-us/sustainability/
Sucafina	Direct Service Provider	SUCAFINA is a multinational coffee merchant, founded in 1977 and based in Geneva, Switzerland, with a family tradition in commodities that stretches back to 1905. "Sucastainability" is SUCAFINA's sustainable coffee initiative. They work with their clients and suppliers to build a supply chain that improves the lives of the growers and provides a steady flow of coffee to their partners. SUCAFINA cooperates with several sustainability farming programs. For more information see: http://www.sucafina.ch
Tchibo	Catalyst	Based in Hamburg, Germany, and founded in 1949 as a coffee mail-order company, Tchibo has expanded its portfolio in the coffee as well as the non-food sector. In 2015 it reached € 3.4 billion with over 12,200 employees of which 8,300 are based in Germany. Tchibo is among the top 10 roasters globally. Since 2006 sustainability is an integral part of the company's corporate strategy. For more information see www.tchibo.com.
Union Hand Roasted Coffee	Direct Service Provider	Started in the United Kingdom in 2001, Union Coffee practices what they call "Union Direct Trade" by finding and working directly with talented farmers, and paying them a fair price so they can invest in their farm, families, and workers. Their coffee is hand roasted in small batches with a focus on quality. For more information see: https://www.unionroasted.com
Volcafé	Direct Service Provider	Volcafé Group, the coffee division of ED&F Man, sources coffee worldwide, with operations in 16 coffee producing countries and sales and marketing offices across North America, Europe, Japan and Australia. VOLCAFE Specialty Coffee, established in 2001, is dedicated to sourcing and promoting the production of high quality and single origin coffees from smallholders, cooperatives and estates worldwide. For more information see: http://www.volcafespecialty.com/

Table 1: Company Names and Descriptions

Originally designated as traders, roasters and brands it became clear that the roasters and brands overlapped, and as such were designated just as traders and roasters. Eighteen coffee companies (11 roasters and 7 traders) were interviewed in total for the global report, with supplementary

information from one roaster and one trader interviewed outside of the formatted interview guide[5], and an additional 5 traders[6] interviewed for the Ugandan national case study[7]. Companies were ranked as small, medium or large based on volumes of coffee traded (estimated in some cases) Large being more than 200,000MT, medium being 90,000MT – 199,999MT and small being below 90,000MT.

During analysis, it was noted that in many cases trends were less associated with position in the value chain as trader or roaster and more relevant to the role the company played in the sector.

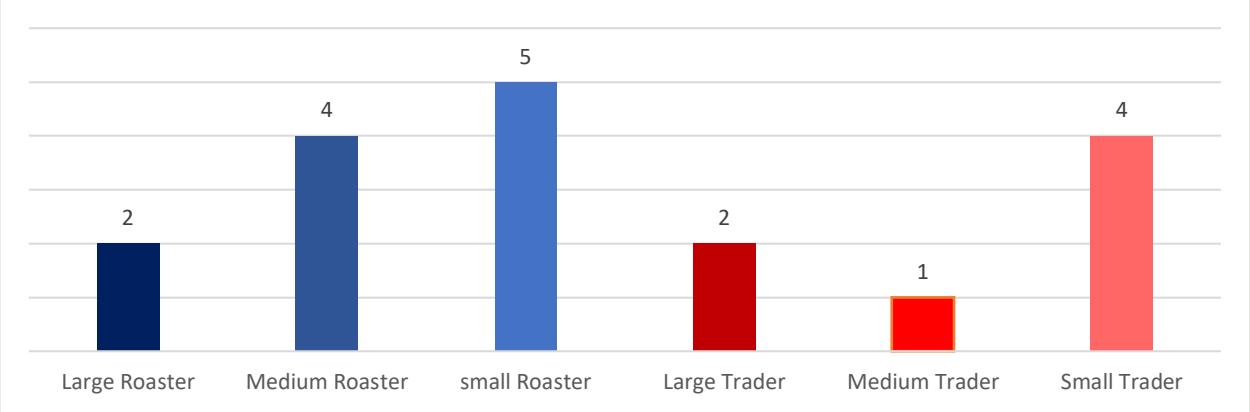


Figure 1: Types of Companies Interview (by # of companies)

The traders and roasters were divided into three categories to reflect these trends: direct service providers, collaborators and catalysts. A brief description of each of the roles is given below[8], which will be elaborated upon throughout the following sections.

1. **Direct Service Providers**: *Providing in-depth, holistic direct farmer services*

Direct service companies work the most closely with farmers, providing holistic services on-the-ground. These companies are generally very knowledgeable about what farmers need in the specific areas in which they are sourcing.

2. **Collaborators**: Sharing the burden of services provision via collaboration.[9]

Collaborating companies have a presence on the ground through implementing organizations. These companies work with others to provide holistic services to farmers. Depending on their degree of ownership over these on-the-ground programs, they range in their depth of knowledge or access to information about what farmers need in the specific areas in which they are sourcing.

[5] These companies are excluded from charts and statistics as they did not follow the interview guide.
[6] Although predominantly traders, two of the Ugandan companies interviewed have begun to roast and brand for the national market.
[7] Results from the Ugandan case study can be found as a separate case study in the "Demand and Use for Climate Change Information" section and are not represented in the general global findings.
[8] The national level interviews from the Ugandan case study are not included in the role categorizations.
[9] Some of the larger roasters fall into this category in that they do partner with others to provide on the ground services. However, their size and resources allow them to also maintain their own staff on the ground (although they may train trainers instead of farmers) who tend to have a better grasp on what is happening with their farmers at origin. These companies are placed in the *Collaborator* bucket, but sometimes act more in line with the *Direct Service Providers*.

3. ***Catalysts**: Sparking action in the sector at a high level with a light touch on-the-ground*

Catalysts are the most removed from on-the-ground service provision. Instead of bottom up, these companies are looking at the bigger picture, even outside of their own value chain. They may provide funding for research or services provision, may be visible as leaders in the sector, and may be interested in risk at origin, but are rarely implementing programs on the ground.

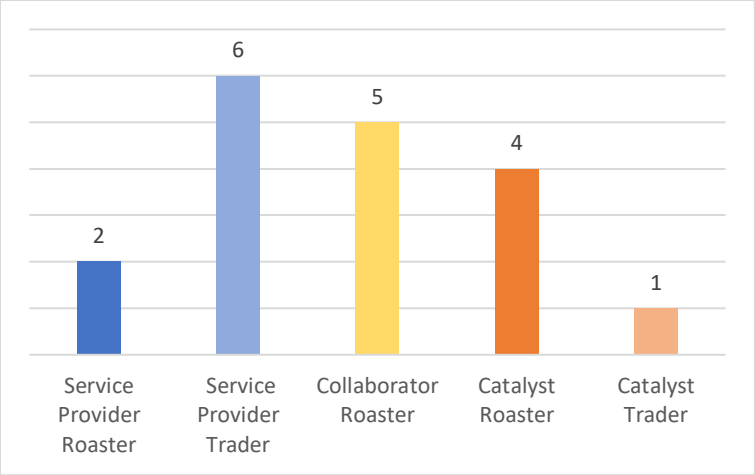


Figure 2: Type of Company by Role in supply chain (by # of companies)

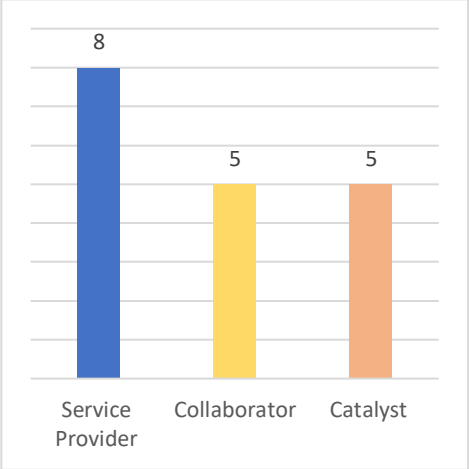


Figure 3: Role in Supply Chain (by # of companies)

Methodology

A team from the Sustainable Food Lab, CIAT, and Green Line Consulting designed and carried out the global study. IITA staff conducted the Ugandan national level interviews in parallel covering similar areas of interest. Because of the difference in the companies' geographic position (national vs. global) and the different format between the sets of interviews, the Ugandan case is pulled out and used as a case study, reflecting the global study.

Interviews were held to one hour and questions asked in an open-ended, semi-structured manner to allow for a freer conversation. Interviews were analyzed based on key words/ideas, not through multiple choice or other semi-quantitative methods. Where the company had been interviewed by Conservation International for the 2016 Coffee Sustainability Catalogue questions were tailored to avoid duplication to minimize burden on the companies.

Those interviewed were chosen based on the perception of who at the company would know the most about climate smart agriculture initiatives. Introductions to c&c member companies were partly made through Hanns R. Neumann Stiftung and the rest through the interviewers' networks. Those interviewed represent a range of positions within the companies, from president/CEO, to COO to heads of corporate responsibility, sustainability, sourcing and supply chain management. As companies are structured in different ways it was not possible to have consistency across companies with regard to position. However, the authors acknowledge that the perception of climate smart agriculture may differ based on position, even within the same company. This will be discussed more below, as this is something for the ARC consortium to consider when working with these private sector companies as well.

Each interviewee at the global level was asked the same set of questions (the full interview guide can be found in Annex 1). The questions covered four main categories (the third and fourth category are merged in the *Results* section to become a combined section: *Drivers for Decision-Making)*. Results are anonymized in order to preserve any competitive information, and aggregated to inform the sector.

The global report is supplemented by a short case study of national level coffee actors in Uganda completed by IITA. A series of semi-structured, qualitative interviews were conducted in Uganda in the last quarter of 2016. The interviews aimed at capturing a sample cutting across the diversity that is represented in the coffee sector in Uganda and included representatives from three local branches of big multinational traders, two medium-sized coffee companies, one farmer cooperative, two civil society organizations linked to a trader and two NGOs/Institutes set up with private sector support. Each interview followed a formal interview guideline, yet this was not necessarily adhered to strictly to allow the respondent to speak freely and to elicit possible extra information. During the interview, before the questions on access to knowledge, the respondents were shown a pamphlet which discussed the projected suitability changes of both Arabica and Robusta coffee by 2050 in Uganda[10]. The respondent was then asked whether such information is useful to them and whether or not this was a good example of a format that is useful to them. The interviews are supplemented by observations and interactions with a wide range of coffee sector stakeholders, during workshops, coffee sector breakfast meetings, and informal and formal meetings.[11]

[10] An example of the type of map shown appears in the Ugandan National Case Study section

[11] For more information on the Ugandan Case Study, see the chapter on Use and Demand of Climate Change Information, as well as Annex 2.

Current Programs, Initiatives and Roadblocks

Current Programs and Initiatives

Each interview started off by looking into activities relevant in the face of climate change carried out by the respective company. Two out of the interviewed companies stated not to have climate change interventions, however then described their sustainability interventions, which did turn out to have a climate change relevance. All other 16 companies confirmed to have relevant climate change interventions in place.

During this first interview sequence, **many companies mentioned not to have stand-alone climate change programmes at producer level, but to work on respective challenges rather holistically**, i.e. as part of services delivered to farmers. Climate change adaptation is a topic taken up at the production level, whereas climate change mitigation (if taken up) is rather taking place in the consuming countries through efforts around renewable energy and or carbon footprinting.

Corporate investments and commitments are thus generally not exclusively related to climate change, but rather to the multifaceted issues of **(i) maintaining and increasing productivity through professionalization at farm level** (this includes sustaining quantities and qualities in the long-term), and linked to this **(ii) a better understanding of farmer needs** (this includes traceability aspects and the shortening of supply chains where possible). Classifying private sector actors according to how they work on these aspects helps to understand which type of climate change information is needed at which level and in which format.

To do so, the table below offers an overview on what the interviewed companies are doing on climate change and / or what their future plans are on the topic:

Company	Experience	Plans
Cooperative Coffees	• Coop Coffee's stable network of cooperatives facilitates the identification of knowledge gaps and needs, and knowledgeable people within that network: linking farmers with farmers. • Coffee Farmer Resilience Initiative (CFRI)– co-funded the Rust Relief Fund together with Root Capital, Keurig and USAID. • A "Roya Relief" fee of 5 US cents / pound was put on green coffee for coffee farmers most in need; since January 2017 3 US cents / pound are being added to all coffees purchased and sold to roasters as a "voluntary carbon tax" fee. • The initial "match fund" has run its 3-year course and has now been transformed into an in-house Coop Coffees voluntary carbon tax fund, from which producers can request	• To bring in roaster community more, shift the focus from smallholders only to a shared responsibility with regards to our CO2 emissions and the impact on climate. • Embracing of environmental responsibility so that it does not appear the producers are asking for money for nothing, but admitting that all actors are part of the climate change problem.

	support for learning about soil management, reforestation, and field renovation which are the priority topics. • The farmer coops that the company works with have access to knowledge and can request through simplified project proposals to implement and follow through with small projects—initially set at up to USD 10,000 (currently under revision to increase the dollar amounts available to producers). • Mainly the interventions cover information exchange and application of best practices in renovation, composting (vermi-compost) and the basic elements of soil life and fertility. • During the rust crisis, the company organized farmer exchanges to show what is possible to address the problem: pruning, renovation, mulching, soil vitality and micro-organisms. • Role of Coop Coffee's roaster network is also to equip farmers with knowledge: access to information is crucial and this is done through peer to peer learning.	• New partnership with Soil and More in Ethiopia just set up to work on soil with Sidama Coffee Farmers Cooperative Union.
EFICO	• Since 2009 we are working to include climate adaptation and mitigation criteria in sustainability standards. We developed a climate module within the generic standard SAN together with the Rainforest Alliance and Anacafé; Pilot testing was done in Guatemala where the first farm was certified under RA Climate Friendly Practices. During this phase, learnings, data and results have been shared with other stakeholders for the integration in the Cool Farm Tool and PCR-Green Coffee for carbon footprint calculations within supply chains. • The aim has always been to innovate, pilot and test and then expand geographically. This was EFICO's start on climate action. Today the climate criteria are included in the generic RA/SAN standard globally and it can be applied for more commodities. • As from March 2016, we formulated our sustainability commitment with regard to five Sustainable Development Goals (SDGs). • SDG 12: Sustainable increase in production and consumption is one of the five focus areas, integrated in EFICO's sustainable sourcing strategy. We apply an inclusive approach where several sustainability standards are supported and promoted. • SDG 7: Focus on renewable energy in European offices and warehouses, solar panels and wind mills. Also in coffee producing countries, EFICO promotes renewable eneryg in remote areas and climate adaptation and mitigation strategies. • SDG 8: Decent work and economic growth. By sourcing sustainable coffees from local actors (cooperatives, local exporters etc.) we have a direct and positive impact on local development. Creating win-win partnerships within the supply chain where every actor can get a sustainable income.	• Recently joined the Sustainable Coffee Challenge • In 2016, reached some major milestones even though we still have quite some challenges and ambitious goals ahead of us. • We will continue our actions as formulated in our ambition up to 2030 for the Sustainable Development Goals and provide a stronger voice in the call for international collaboration and action to tackle sectoral challenges. • An important focus area in 2017 and 2018 will be to review and reorganize our integrated management systems towards a practical and bottom-up approach: risk-assessment, product requirements, food safety and occupational health will drive these systems. • Given the sectoral challenges of climate change and price fluctuations in the international market, we will continue to focus on partnership building with both our

	• SDG 17: Teaming up with local and international organizations to promote partnership building and bring climate change on the agenda in production as well as consumption countries. • SDG 4: Quality education: reinforce the empowerment of coffee producing communities, and contribute to sharing of knowledge and responsibility. • EFICO foundation funds projects with specific focus on quality education, knowledge transfer and climate change (e.g. solar energy, efficient wet mills to reduce methane, training) and focuses on vulnerable coffee communities . • Work through partnerships to motivate governments to engage in climate change activities nationally and globally. • Together you can achieve more. EFICO considers its impact on the environment within the coffee supply chain as one of its responsibilities, and commits to act accordingly. This commitment is reinforced and discussed at international and local networks, such as the Sustainable Coffee Challenge and The Shift, in alliance with the UNGC Network Belgium. Aiming to achieve transition together. • A multi-stakeholder approach is needed to take on this international challenge. We stimulate our suppliers and our clients towards a more sustainable coffee future. By actively listening to the needs of our partners, we aim to bring built-up partnerships amongst private, public and civil society actors and join efforts to achieve transition.	customers and suppliers, as well as with institutional parties. • EFICO looks at a coffee future where all actors within the coffee supply chain can benefit without harming the potential for the future generations. This vision goes hand in hand with our continued focus on responsible production and consumption. • We aim to apply an inclusive strategy that also reaches the most vulnerable farmers and empower them towards sustainable income creation. • With the EFICO Foundation we will continue to invest in quality education for a.o. children and youngsters in coffee communities since they are the future of our society. • This long-term investment will guide us towards a transformational, sustainable coffee future.
Farmer Bros. Co.	• Looking into GHG output per kilo of coffee. • Investing in technical assistance and trainings, this is the main focus of their work. • Direct trade program and responsibly sourced platform. • Tailored programs and common metrics for M+E purposes.	

JDE	• JDE's Responsible Sourcing Program focusses on 3 pillars:
	  ○ Coffee origin interventions and global partnerships
	  ○ Sourcing certified and verified coffee
	  ○ Supplier Initiative
	• Work on CSA is delivered through agronomy related projects and the main focus is always on agronomy ("it was called GAP five years ago and is now CSA").
	• All projects in origin countries address good agricultural practices and more recently climate smart agriculture interventions. Latin American projects are in Peru, Colombia and Honduras, Asia projects in Vietnam, Indonesia, Laos and in Africa in Tanzania, Uganda, Ethiopia and Rwanda.	

Keurig	• Keurig has completed an updated GHG footprint inclusive of the supply chain. Estimates are made from the production level using industry standards related to production (for	• Keurig's 2020 Sustainability Targets (specifically the two below) promote

	example, average GHG emissions for Brazilian Arabica production are used for the Brazilian segment of Keurig's chain) instead of directly from farm level data. • Within Keurig's responsible sourcing guidelines, gathering emissions data is encouraged but not mandatory for suppliers and is not audited. Adaptation and sustainable production and processing practices are also encouraged. • Investments are made in the supply chain to support producers in the uptake of adaptation and climate smart agricultural practices. Keurig requests metrics on adaptation (for example, producers adopting CSA practices, hectares under improved management, # of wet mills upgraded, and estimates of water savings) for its 2020 sustainability targets, which try to capture how investments have impacted people and resources. • Climate data and/or research has been incorporated into the advisory services of major programs such as Coffee Farmer Resilience Initiative (CFRI), the Blue Harvest, and others to inform farmers and farmer organizations on practices to mitigate or adapt to changes in climate. • Keurig believes the varietal research and trials being conducted by World Coffee Research will also significantly contribute to long-term climate resilience for the coffee industry and that this will be the key to a sustainable supply of coffee in 50 years.	practices in the supply chains that lead to climate resilience: ○ By 2020 engage 1 million people in their supply chains to significantly improve livelihoods, including water security and climate resilience. ○ By 2020 source 100% of coffee according to their established responsible sourcing guidelines. • Based on the results of Keurig's Corporate GHG footprint, the biggest opportunity area is on the brewer side of the business which will be the near-term priority for reductions.
Lavazza	• Member of c&c and further work on CSA through own projects to help farmers become more resilient to climatic changes. • Examples for specific practices explored are water harvesting – collection pools to get through droughts / dry spells, planting Bracharya between coffee trees to keep soil moisture and to increase resilience to drought/dry spells or using gypsum to facilitate coffee roots growing deeper, which allows the tree to access deeper water. • Main experience gained in Tanzania, Brazil, Guatemala and Vietnam.	• Future work in c&c will include new areas / origins, but this has not been defined yet.
Nestlé	• Main approach is on adaptation with a focus on agronomic practices, whereas mitigation is not a priority; In terms of proposed adaptation practices where are aligned with the coffee&climate initiative. • Main intervention areas are pest and disease control, shade management, cover crops, wind breaks, micro-climatic approaches regarding temperature increases, unseasonal rains, humidity and drought • Drought tolerant varieties and coffee propagation are gaining importance. Different propagation techniques are having effects on draught tolerance at the initial planting stages. Depending on the origin and conditions also top grafting as part of rejuvenation will be very beneficial especially where access to planting material is difficult. • Has an R&D center in Tours, Abidjan working on such aspects.	• The approach is impact oriented, aiming to measure return on investment / value created. In the future, the focus will be put on adoption practices (efficiency) at farmer level to increase productivity (not on area expansion!) • Certification / verification may become less important as impact in terms of farmer income has not always been convincing. Main driver for farmers was to get premium, not necessarily to increase productivity, which would have generated much higher

	• The sustainability activities are framed within the Nescafé Plan; within this Plan 250+ agronomists directly train farmers. • What is gaining importance is also the topic of diversification / multi-cropping (fruit trees, pepper, cash crops), e.g. in Vietnam or in Thailand, opportunities also in Indonesia, Cote d'Ivoire and other countries. • These topics are not new in coffee, but there is little local / regional knowledge available and over the years knowledge (e.g. on intercropping) has been lost with big origins moving in mono-cropping; these approaches need to be looked at from a different angle factoring in climate change however taking also into account economic factors such as labour availability / labour productivity.	incremental income. In order to make real changes in origins with low productivity, focus is on yield increase. • Empowering agronomists with internal tools to drive adoption at farmer level will be key in the future; in this aspect, the company fully relies on the creativity of their own people. By setting own targets to be met internally the agronomists are empowered to think and puzzle out in their own environments what works best and can then move into that direction without having to wait for long discussions and decision-making rounds • The weakness of pre-competitive approaches is size and speed of the interventions.
Olam	• Sourcing activities in 21 origins and direct operations (Olam plantations) in Brazil, Zambia, Tanzania, Laos. The activities range from Economic Development and Livelihoods to increased resilience to climate change-related risks. They respond to landscape and environmental priorities, economic supply chain needs, and social priorities. Currently Olam runs 20 sustainability activities with partner organizations (NGO's, Donors, Local Governments, etc.) • Own approach to cover the whole range of sustainability aspects relevant to farmers. Economic, social, and environmental in line with the Olam Livelihood Charter (OLC). Flagship sustainability projects and initiatives gain Olam Livelihood Charter (OLC) status when they address all 8 principles of access to finance, improved yields, labor practices, market access, quality, traceability, social investment and environmental impact. The OLC results in better productivity and returns for farmers and sustainability assured for our clients. In 2016, The OLC and project initiatives reached close to 30,000 coffee farmers across multiple origins. These initiatives are geared to help smallholders increase farm productivity and profitability while enabling us to offer sustainable, traceable and socially responsible coffees from various producing countries. • Several Olam projects in at-risk origins are contributing to climate resilience and preventing deforestation through sustainability projects and certified or verified sourcing. Olam works with partners in various countries such as Indonesia, Vietnam, and Peru, to support climate resilient communities and protect forests.	Olam has become an active member of the Global Coffee Platform (GCP), which is the leading facilitator of the coffee sector's journey towards sustainability. After listening to producers, governments, NGOs, and stakeholders in the coffee value chain, GCP identified 3 critical threats to the coffee sector: Economic Viability of Farming, Climate Smart Agriculture, and Gender and Youth. Each area is addressed through a Collective Action Network. For instance, Climate Smart Agriculture facilitates, aligns, and drives industry's actions to improve climate smart farming thus adapting and building more resilient communities. Olam recognizes that the scale of the climate change challenge is so great that it must be addressed jointly by working with other coffee stakeholders including peers in the private sector, NGOs, producers.
Strauss Coffee	• Strauss Coffee, as part of Strauss Group, has an environmental long-term plan to cut use of water, energy, waste and emissions, executed in the last 5 years in all its operations	• Strauss Coffee is considering decreasing their contribution to programs like 4C and focus more

	• In 2017, the sustainability program involves investment in six running long-term projects, focusing on women's empowerment in the coffee sector. Investment is increasing every year.	on concrete programs in origin as generating impact is key for them –in total increasing investment significantly, but diverting some of the investment in Platform to direct plan, yet still contribute also to 4C and members of the platform. • Plan to double number of project in the coming years.

S&D	• Thinking about climate risk as part of the sustainability program
	• 16 projects in coffee (and tea) in Guatemala, Colombia, Brazil, Peru, Costa Rica, Nicaragua and more:
	  ○ Investing in smallholder communities to provide resilience to climate change but also to market shocks and more generally
	  ○ Engaging in continuous improvement processes
	• Worked with HRNS in Brazil and Guatemala: more of a climate focus in Brazil because of the droughts
	• Worked with Volcafé in Costa Rica on a small landscape assessment: ran an assessment of natural capital in the region, then tailored technical assistance to preserve forests, watersheds and endangered species
	• Member of the Coalition for Coffee Communities in Nicaragua
	• Focus of all sustainability engagements is on impact on the following key areas:
	• Increase Productivity
	• Cost of production (part of farmers' profitability)
	• Water management
	• Soil health
	• Forest conservation (by increasing productivity drivers to encroach on forests can be reduced)
		• To hit the five priority areas.
		• To be innovative in capturing as many pillars as possible.
		• To keep improving upon direct CSR targets and methods within the company for facilities and related energy, waste and water targets.

Sucafina	• Own internal climate change program. • In origin adaptation is the focus, but the company is also looking into insetting (and less offsetting). • At production level, the main interventions are on: shade trees; in Burundi and Rwanda this is done via standards (number of shade trees on the farms) for soil moisture; in Uganda there are hardly any certified farmers so here interventions to protect production are implemented with the support of donors (e.g. a large scale shade program including a Memorandum of Understanding with the National Forestry Agency and looking into planting material - coffee seedlings - and shade tree species). Uganda is	• To set up a shade tree program: push more on insetting, better informed and performing washing-stations. Looking at how to register shade tree program into carbon projects. • These activities are not going to finance themselves and the industry cannot finance year after year, so the idea is to deliver seed-

	experiencing heavy shifts in rain patterns, and thus flowering times, so action is urgently needed • Training material from Café Africa on Good Agricultural Practices including climate change (mitigation and adaptation) is used. • In Brazil mulching and trenches in farms are the main interventions for protecting water sources. • Adaptation is the first priority, mitigation is a nice bonus at farmer level.	funds and support in setting up a self-financing mechanism.
Tchibo	• Gained knowledge and insight into a carbon credit project in coffee production through a joint collaboration with GIZ, Ecom based on a World Bank approach from 2009 to 2011, where it was found that it was far too complicated and costly to pursue such strategies at the smallholder scale. Furthermore, the project developed learnings that delivered input into the add-on 4C Climate Module with a focus on adaptation. • GCP engagement entails climate smart agriculture as a priority topic. The company continues as a member of C&C and strives for a better cooperation with the sector network to use synergies. • Tchibo's farmer support program is called (Tchibo Joint Forces!®), it consists of a number of modules which include climate change adaptation practices. • Active involvement in footprinting initiatives e.g.: o Product Carbon Footprint project (THEMA1, Oekoinstitut, Potsdam Institut fuer Klimafolgenforschung) developing a carbon footprint for a Privat Kaffee Rarität from Tanzania that was Rainforest Alliance certified. o Development of the Green Coffee Product Category Rules for carbon footprinting up to the point of export in origin (expired meanwhile as not updated). • Environmental Footprint Pilot (PEF) by the European Commission in the coffee pilot until it was discontinued in 2015.	It would be beneficial to have a central contact point potentially global but certainly on local level to access information on who has climate and nationally specific information and where to find it. This would enable to identify for each region whether there are future climate suitability maps, who are the local climate experts, whether there are other activities ongoing to potentially exchange knowledge with or corporate and access learnings.
Union Hand-Roasted Coffee	• Union Hand Roasted Coffee has a different approach to sustainability (which includes environmental sustainability). By paying higher price for the green coffee we enable and empower the producers to take charge and invest in good agricultural practices including farm diversification. We provide guidelines on GAPs within our Code of Conduct. We believe in empowering the producers and implementing a bottom up approach to environmental sustainability rather than investing in specific top down climate change projects. • Union Hand Roasted Coffee has their own Code of Conduct, which all suppliers (coffee producers) need to commit to; climate change is widely covered in this Code of Conduct and provides guidelines to producers on GAPs.	• Further work on climate change issues through their own Code of Conduct. • Union is approached by many companies and NGOs to collaborate on new projects, but is careful to balance their engagement according to human resources.

	• Union Hand Roasted Coffee is implementing a project in Ethiopia, focused on preserving Wild Arabica Species in the Yayu Forest as well as improving Livelihoods. The project is co-funded by DFID and Kew Gardens: Wild Coffee Forests and surrounding forest areas are part of a coffee farming system that benefits livelihoods and nature conservation. Working with the communities at Yayu to improve the quality of their coffee, which via Union Direct Trade means that better prices are paid to the farmer. If the coffee is worth more, the value of the forest also increases, providing an incentive for its preservation.	
Volcafé	• Climate change needs very localized support: Extreme weather events are more frequent, more erratic weather patterns, droughts, etc. This is observed by, and addressed by, teams on the ground. • Focus is on building resilience in the face of climate change (e.g. through better soil management - moisture retention, additional organic matter, mulching to protect soil, planting shade trees – soil stability and micro-climate aspects on the farm) • There is a global curriculum developed by senior agronomists with a focus on time-tested solutions; any recommendation made is very mindful of farmer resources and assurance that they are effective. • Interventions need to be practical, not capital intensive, low-risk and proven to make a difference.	• To address the immediate concerns of farmers – costs of production, farm profitability – while also continuing to build resilience to climate change.

Table 1: Overview of companies' experience and plans

The majority of the interviewed companies indicated that they have climate change interventions in place; only two have sustainability initiatives and programs, but no specific climate change activities. Most of these interventions are at the farm and / or cooperative level regardless of the type or size of company supporting the investment:

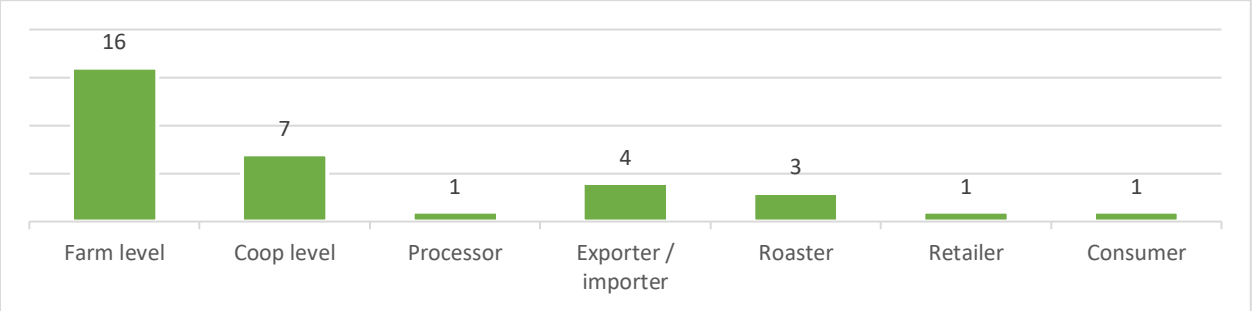


Figure 4: Intervention focus in the chain (by # of companies – multiple choices allowed)

At the farm and enterprise (coop) levels, the focus is clearly on adaptation and good agricultural practices through extension and research. Furthermore, specific topics addressed are social resilience, business skills and access to agricultural inputs. Regarding climate change mitigation, the traders are more active and involved than the roasters. **Traders engage in carbon foot printing, carbon projects (offsetting / insetting) and in aspects around renewable energy**. Due to their position in the chain they are better able to facilitate data collection up and downstream. At the same time, many of the roasters mentioned interest in the topic of climate change mitigation, however either found the existing mechanisms too complex and lengthy and / or developed their own mechanisms for some data collection on greenhouse gas emissions. In the latter case data collection was still considered a learning activity without defined implications on sourcing strategies and / or internal changes.

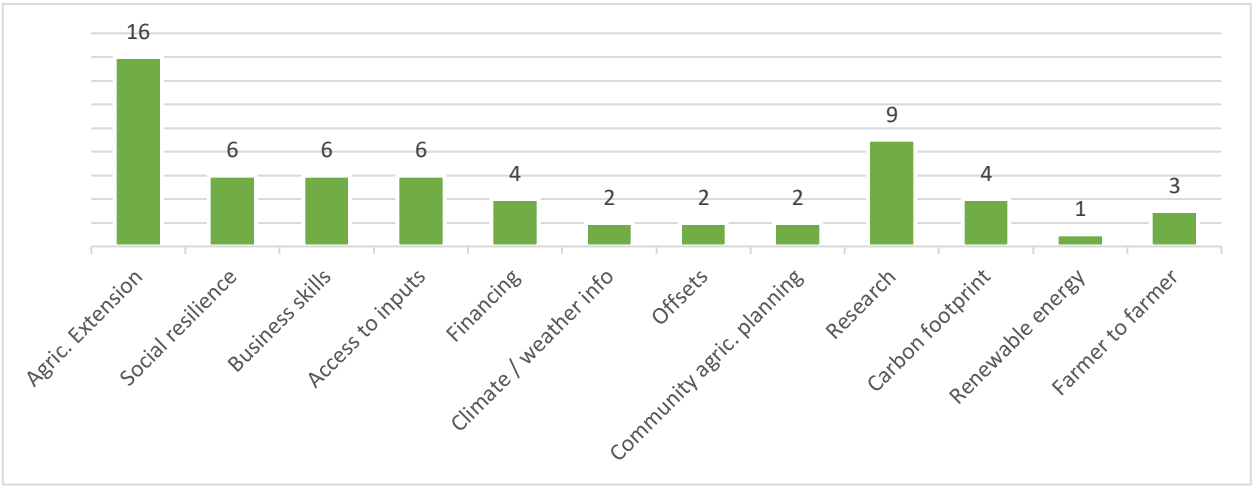


Figure 5: Intervention areas (Multiple choices allowed)

Besides agricultural extension and social resilience, which are targeted by roasters and traders alike, roasters are rather focusing on business skills and research. This can be explained by their interest in sustaining supply on the one hand and bigger margins to invest in research than available to the traders on the other hand. Traders focus more on the immediate needs of the farmers such as access to inputs and farmer to farmer, or peer to peer, learning as a means to motivate producers and encourage uptake of proposed agricultural practices.

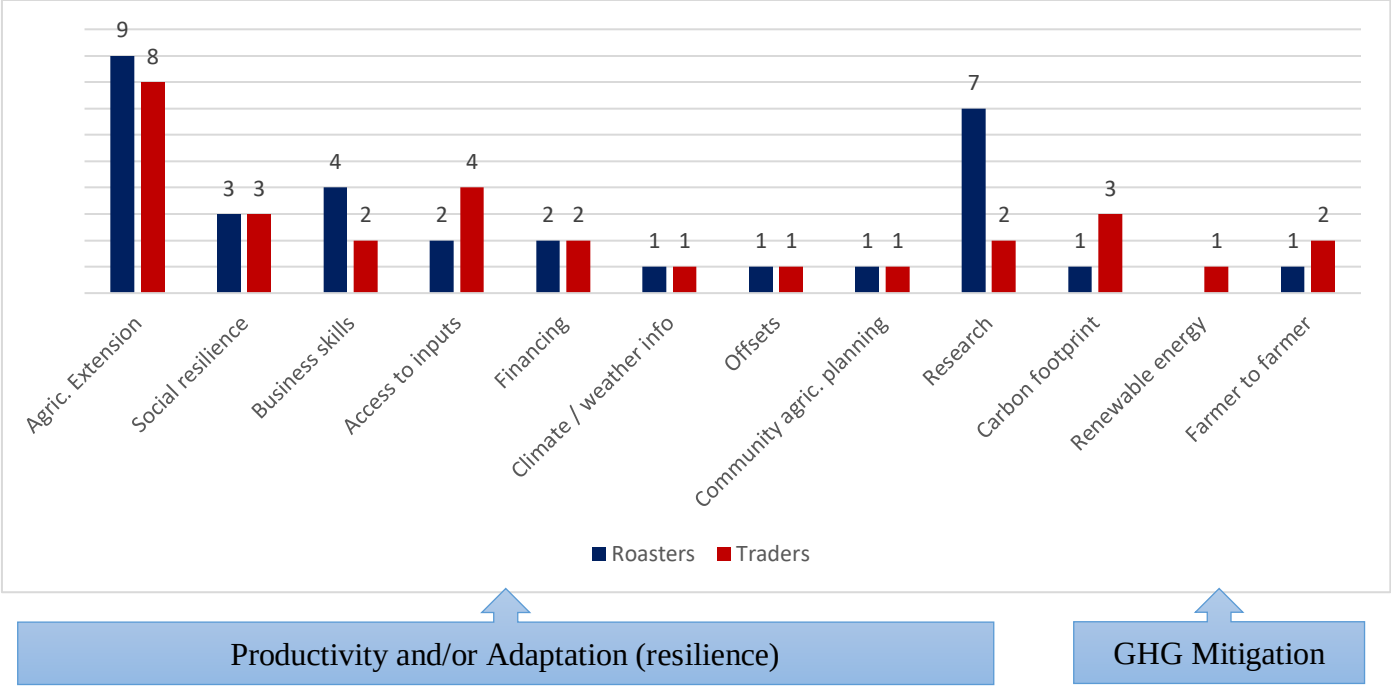


Figure 6: Type of Intervention by Roaster/Trader (Multiple choices allowed)

Those companies with local presence (mainly traders) are offering their own extension services. Companies with limited local presence and / or resources may use certification/verification across their portfolio but still implement own projects in particular places (including certification / verification processes). Roasters as well as bigger traders tend to have a broader strategy, based on more resources, to identify and cope with potential climatic risks to their businesses.

All interviewed companies had the understanding that climate change needs to be taken on by the sector and thus by all the different supply chain actors.

> *"Our commitment to Growing Responsibly demands that all our sustainability programs include agricultural measures not only to protect the environment but also to provide farmers the tools and knowledge to be economically and socially viable." But for real scale and impact, they require the participation of multiple stakeholders. (Our Roaster customers, NGOs, the International community and the Local Governments, etc.)" –Olam*

It is not a topic where (sector-wide) impact can be achieved by a single company alone. This also explains why climate change is a topic rarely worked on by a single company alone, but rather in collaboration with others. The main collaborating partners besides the supply chain actors

(roasters, traders and farmers / cooperatives) are NGOs and research agencies. For the roasters, the traders are the first collaborating partner to turn to as they can offer local knowledge and insight, connection to the farmers and (some) implementation capacity. Traders tend to team up specifically with local / regional / national institutions in origin to cover topics where they are not the experts, e.g. with national forestry agencies or research centres. Almost all the medium-sized to large companies (traders as well as roasters) have participated in multi-stakeholder initiatives. The small companies tend to stick to their known partners, mainly farmers and producers, and look for further support or alliances (mainly regarding research) on specific topics they cannot cover internally.

"To achieve the security of our coffee supply and a viable future for coffee producers, we have a lot of work to do to at the industry level to prepare our supply chains, the land, and the coffee trees for changes in climate." – Keurig Green Mountain

The most well-known climate initiative in the coffee sector, the *Initiative for coffee&climate* (c&c), was mentioned in the interviews by members of the initiative only, which in the framework of this study, are all roasters. The other interviewed companies were either not aware of such climate change initiatives as c&c or other platforms or did not see these initiatives delivering towards their own climate change strategies and envisioned impacts. A factor contributing to this might be geography, with the US based companies being less aware and involved in the European based initiatives. Initiatives such as the Coffee Farmer Resilience Initiative and the Coalition for Coffee Communities were widely noted by the US companies.

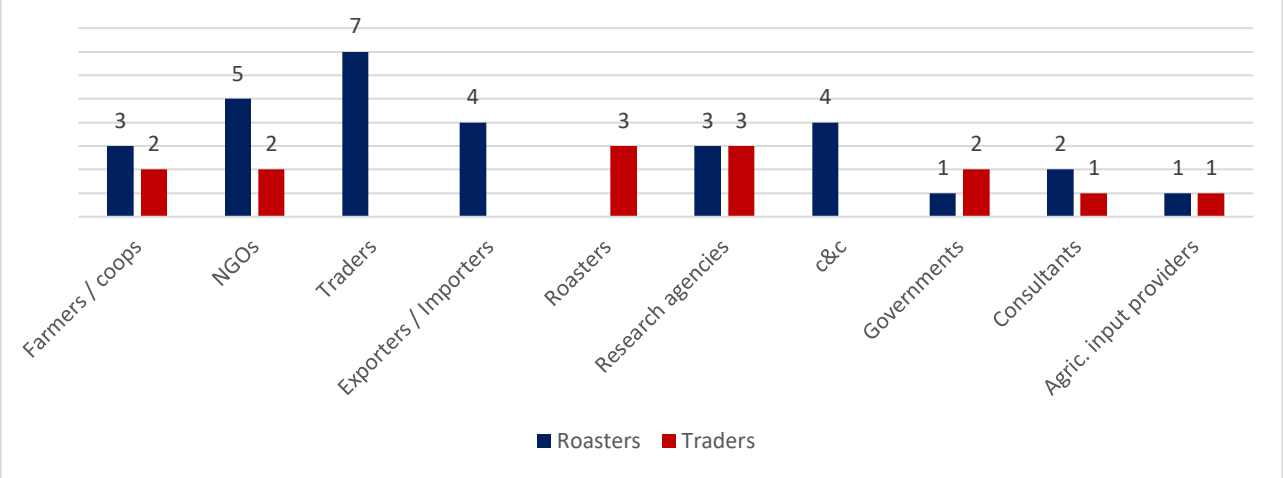


Figure 7: Collaborating partners on climate change issues (partners per actor)

Fifty percent of the interviewed companies indicated they feel most of the responsibility to support farmers in climate change adaptation to be in their hands, whereas 23% felt they share the responsibility and another 22% said they have little responsibility. Clustering actors according to company type (roaster / trader) or size (small, medium, large) on this matter did not show any trends. Whether supporting farmers to take on climate change challenges and thus the level of considered responsibility is perceived high, medium or low rather seems to be linked to corporate priorities and business models. **Those companies whose operations are closest to the farm and / or depend on specific origins and potentially producer groups for their supply expressed a higher degree of (and taken on more) responsibility for helping farmers adapt**.

This is similar regarding the perceived effectiveness of their climate change strategy / interventions: 39% of the interviewed companies consider their approach as very effective, another 39% consider their approach as moderately effective and the remaining 22% did not know / did not indicate a level of effectiveness of their climate change approaches. A trend according to company type or size on this question was not found, however, the closer to the farmers and / or the more dependent on specific origins and potentially producer groups the more convinced the companies were of having an effective climate change strategy in place. Ultimately this indicates: the better (more direct and more intense) the communication between the producer level and the company, the more responsibility seems to be taken on by downstream actors. Communication and proximity to origin also indicates programs more tailored to producer needs and realities leading to more (perceived) effectiveness.

These findings give a first indication on the above-mentioned *roles* (see "Description of companies and categorizations") of direct service providers, collaborators and catalysts. **Most of the traders, regardless of their size, are providing holistic direct farmer services. The roasters are more likely to be collaborating with other actors to deliver climate change support to farmers.** Depending on their perceived share of responsibility they are rather having a high-level strategy on the topic and looking into the provision of funding based on their supply chain risk than engaging more deeply in the topic. In this last category there are some, who **catalyze** thinking ahead and exploring the topic from their supply chain position, getting engaged in some implementation activity but also working through partners.

This categorization can also be explained by the closeness and dependency on specific origins and producer groups on the one hand (traders being close to the farmers, knowing about farmer needs, having local structures in place and smaller roasters with a short supply chain being in the same / a similar position; roasters relying on upstream supply chain actors and others to support the farmer level) and corporate priorities on the other hand. **The further away the company is from the production level and the less integrated sustainability aspects are in the business model, the smaller results the company's engagement in climate change interventions**.

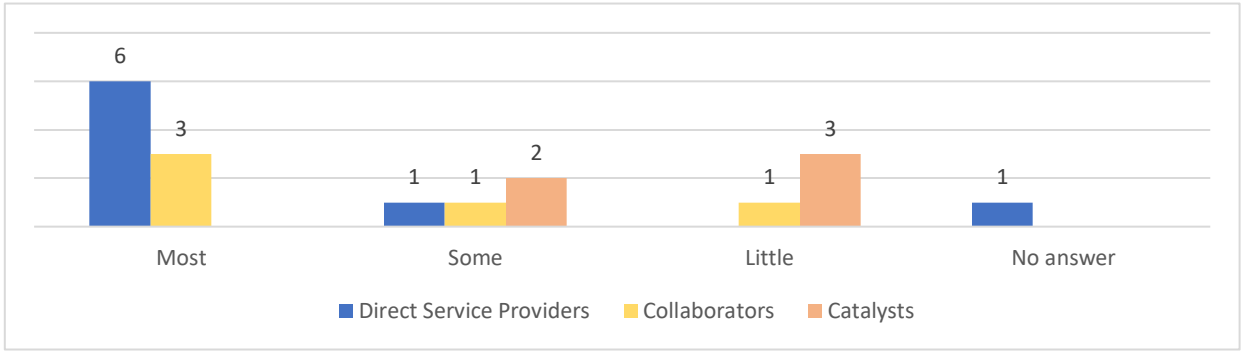


Figure 8: Indicated Responsibility to support farmers on climate change (by company role)

The majority of the *direct service providers* and the *collaborators* feel they have (and take on) most of the responsibility to support farmers in facing climate change challenges, whereas the catalysts see themselves with little to some responsibility in this task.

Also regarding the respondents' considered effectiveness according to the actor's role there is an indicated trend. The *direct service providers* mainly consider their approaches to be very effective, whereas the Catalysts see their interventions as only 'kind of' effective. Among the Collaborators there is no clear trend on this question.

Roadblocks - Summary and Insight into Conclusions

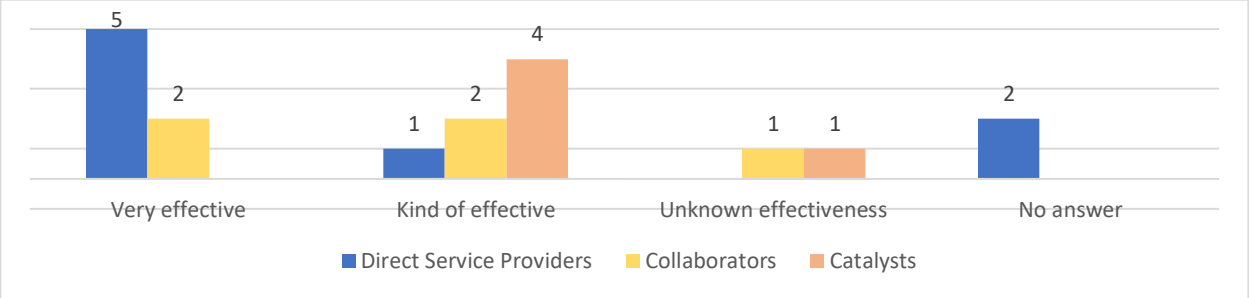


Figure 9: Indicated effectiveness of climate change Interventions / strategy (by company role)

All interviewed companies have engaged in climate change activities in some way or another. Even though they may not have specific climate change interventions, their sustainability engagements touch upon relevant climate change aspects. **This points to an ongoing challenge in language that a number of core 'sustainability' investments focused on good agricultural practices, credit, etc., can also be considered 'climate smart,' however are not classified as a 'climate program'.** The following list offers an overview on roadblocks mentioned by the companies in their initiatives and, where available, lessons learnt or solutions on how to overcome these (*see Table 2 below*):

Level	Roadblock	Lesson learnt / solution
Farmer Level	*"Roadblocks in supporting farmers are not only specific to climate change. Projects will always come with geo-specific challenges that need to be addressed or projects to be adapted to the local reality. There is seldom a one-size-fits-all strategy." - JDE* ▪ Low education levels and little knowledge amongst farmers around climate change and potential counter measures (adaptation and mitigation) ▪ Time: farmers usually follow benefits seen, but then adoption on large scale takes a lot of time *"Even when donor projects are approved, the roadblock is the ability of the farmer to implement the recommendations or improvements" -Sucafina* ▪ Certification / verification takes a long time and binds resources that could otherwise be invested in projects to help address more specific issues focusing on long-term impact ▪ Mitigation work is very complex, cumbersome and takes time, whereas it offers little benefits in most of the cases ▪ Lack of profitability in coffee farming and thus of funds at farmer level to invest into their plots ▪ Cultural aspects and local customs sometimes pose a challenge, especially when implementers are not aware of them, e.g. many women work in the coffee plots, but it's mainly the men in trainings, which could be due to religion, custom or culture; in each occasion it should be key to figure out how best to reach the persons mainly active in the farms ▪ The coffee sector lacks knowledge and expertise on soil and this is (among) the most important factor(s) in farming ▪ Getting practical information in a systematic way circling around farmer groups – each group is a closed entity and if no umbrella	▪ Other means and benefits needed to motivate adoption of proven CSA practices ▪ Family-run businesses potentially have a more long-term strategy and closer/stronger relationships to farmers ▪ Initiatives need to go beyond pure certification / verification ▪ Know local customs and circumstances before starting any intervention; e.g. tailor trainings for women only and have a female trainer or find a neutral location for anyone to participate (e.g. a school) ▪ Learning from knowledgeable lead farmers, and promoting opportunities for them to visit and train other farmers is often most successful

	organizations exist it is hard to pass on knowledge / expertise from group to the next ▪ Human elements can block scaling up ▪ Communication with the farmers: it is mainly easy to communicate with the leaders, but getting that information to all farmers is another aspect and usually not working that well, particularly where farmers are widely dispersed even though they may belong to the same cooperative ▪ If information has to be collected from farmers, cooperatives usually do not have the means to hire someone to do so, thus the data needs to come from the individual farmers; having them all come to meetings for this purpose is time and resource intensive ▪ There is an urgent need to bridge the divide been agriculture and forestry to develop more effective agroforestry systems. Rare to find foresters who know ag, and there is a lack of knowledge on how to combine timber/other tree species with coffee, cocoa. Little attention is given to producing high quality "shade" tree species, or to the management and commercialization of the timber and other shade trees.	▪ Agronomists or whoever trains the farmers need to be charismatic and passionate about their work ▪ Looking into other means for data collection, e.g. via SMS or radio; short case studies on how to disseminate and collect information might be helpful ▪ A new, more interdisciplinary paradigm in required, involving tree experts in the design and implementation of larger-scale agroforestry initiatives.
Company level	▪ High-level buy-in for sustainability (climate change) issues in corporate structures is usually low as the focus of the shareholders is on Return on Investment ▪ Climate change mitigation depends on huge investments, some initiatives on this have been supported, but this is nowhere close to moving the sector (this is the case for carbon projects but also for data collection for foot printing) ▪ Limited knowledge / expertise on climate change aspects specifically at higher levels and when it comes down to operational level, thus there are limits in integrating climate change aspects into own sustainability work*:*	▪ The right information needs to be in the right hands, lengthy searches for information and / or experts wastes resources; so finding / having the right people at hand is a key success factor ▪ Joining a global platform has helped streamline and focus the work on the most important adaptation processes

	"When it comes to making programs operational, if you work in supply chains where there's not sufficient knowledge available or your partners have a different philosophy how to address the topic, and if you are outside a scientific framework in day-to-day business it is not easy to integrate new elements in an efficient way that works in the field." – Tchibo ▪ A lack of consolidated information on implementation aspects: who is working where on which topics; therefore everyone starts from zero when looking into the issue ▪ Lack of funds to reach all farmers: where farmers are widely dispersed many agronomists would be necessary to reach them, but especially smaller companies cannot afford to hire many agronomists; also funds for scaling up are limited so a small successful initiative may stay at local level, although the approach might be beneficial for many more coffee farmers ▪ Limited funding to tackle the scope of the problems in the coffee sector *"In countries with ineffective governments the problems are much harder. For example, in some countries the governments are not doing enough and there is a place to improve, whereas Brazil is in a much better state due to well elaborated environmental laws." – Strauss Coffee BV* ▪ Sharing data/information with others is a challenge so that many actors seem to be investing in similar / the same things *If we can pool the resources that all companies are working with…and If we can try to remove some of the competition barriers and share a lot of that information into those landscape assessments we can have a much broader impact as an industry." –Farmer Bros.*	▪ Pooling resources might be more effective and efficient regarding topics that concern the sector as a whole, e.g. research on varieties / WCR

	▪ Complexity and stakeholder management is extremely time-consuming and binding resources that could rather be spent on impact and scaling up proven approaches ▪ Under-financing of research e.g. on breeding and propagation due to lack of funds → tree crops are under-financed because of the perennial nature of the crops and companies are not in the position to spend 15-20% of their revenues on R&D like is the case in other sectors such as in fertilizer production	
General		▪ Peer to peer learning and exchange visits seem to motivate farmers best ▪ It is not necessary to always look for the big solutions, but to focus on simple applicable measures with immediate impacts

Table 2: Roadblocks and lessons learnt on climate change interventions

The experiences and roadblocks gathered throughout the interviews show that climate change is an important topic, though it is not considered a stand-alone issue but rather as one piece of the sustainability aspects relevant in the coffee sector. At the same time, almost all actors consider sustainability in general, and climate change in particular, to be a topic that can only be taken on by the sector as a whole and not by a single actor:

"No single actor can make a difference as the task is much too big and requires collective public-private action. Only a combination of actors, a combination of supply chain activities and a systemic approach can make any difference." – Tchibo

In this understanding it is not (only) important to have a story to communicate in order to boost reputation and visibility, but coffee actors more and more look into the impact their investments achieve. Climate change interventions are hardly used for communication purposes to the (final) consumer.

"Visibility is not our priority. Our aim is to create a positive impact within the green coffee supply chain, and take our responsibility accordingly. A long-term approach is needed to make the transition towards a sustainable coffee future." – Efico

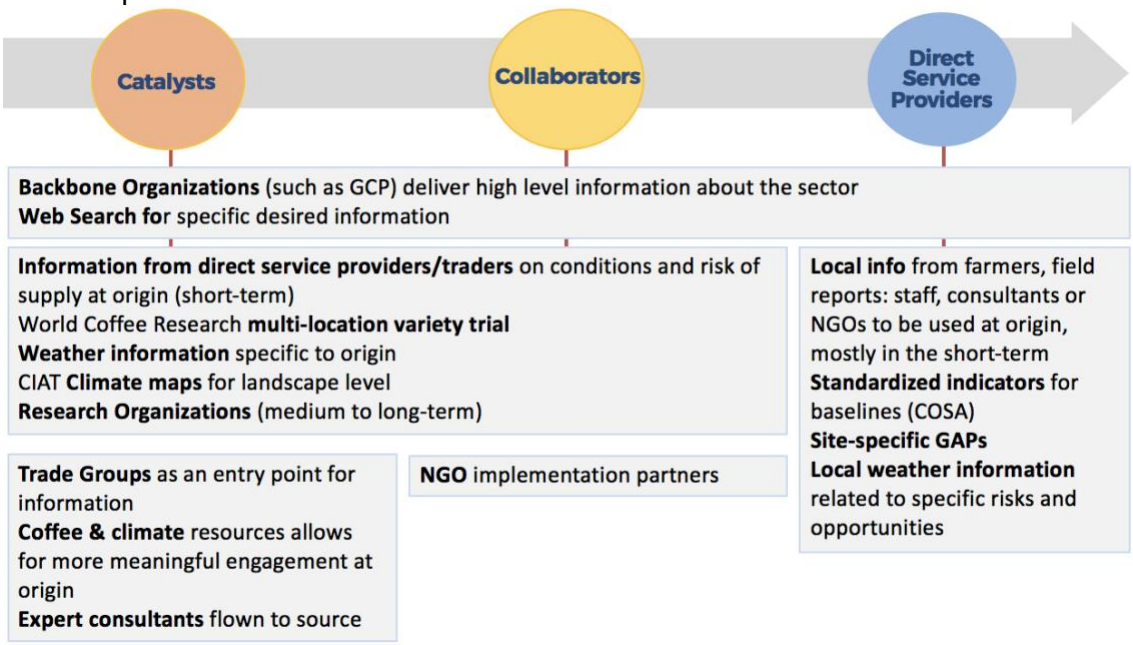
However, this approach (looking into the impact possibly achieved by a certain actor's investments), may also lead to some actors considering themselves too small to make a difference and not prioritizing climate change as an area for intervention, using systemic and comprehensive plans for environmental protection, but not with an explicit climate frame:

"We have several initiatives to reduce our carbon footprint. Yet, in countries of origin, we are mostly focused where we can make a change and see impact." – Strauss Coffee BV

Overall, most of the interviewed companies agree on the urgency to take on climate change jointly, though, which is also reflected in the platforms and joint interventions addressing the topic. Furthermore, the analysis of climate change experiences and lessons learnt showed, that (most of) the interviewed companies are lacking a leader on the topic; an institution that gathers existing climate change information, facilitates it to the sector and has an overview on relevant developments and initiatives.

Demand and Use of Climate Information

In general, all types of companies identified are interested in origin level information regarding which practices are most suitable for climate adaptation. Similarly, all types of companies are interested in evaluating origin level exposure to climate change risks via landscape level tools such as climate maps.



Beyond that, companies interviewed had differentiated demands for climate-related information based on the level at which they interact with farmers. **More *direct service providers* have use for ground level information** such as site-specific GAPs, local knowledge (hydrogeology, shade tree species), local weather, cost-benefit analysis and production-level emissions data.

> *"We're educated on reports that come out and at the same time, we are observing climate change in the field every day and taking an applied approach to addressing it every day."-Volcafé*

The Ugandan case study reflects the use of on-the-ground, production-level information. In contrast, ***collaborators* who work primarily via consortiums and partnerships with traders, and *catalysts* have less use for producer-level information and instead rely on or would like to see broad information such as climate maps, site-specific GAPs and case studies on successful solutions and approaches**.

> *"In general [we want] knowledge about how coffee cultivation is affecting the natural environment in the locations we source from and to understand how we can best support coffee farmers through partnerships to tackle the challenges to their future including the threats climate change poses for coffee growing. But, we also need to think much wider than that. We need to, as a sector, think about ecosystems where coffee is produced as a whole, look at the key resources and constraints against the knowledge we have on climate and water risks. We need to understand how that all ties together to support the agricultural production, livelihoods and allow for ecosystems to remain intact or restore themselves if already degraded. We also need to find a way to collaborate more effectively across sectors and to link these efforts to the national action plans for climate change as relevant." – Paulig*

Simply based on their position in the value chain, *direct service providers* require information at the local (sub-national) level, and are particularly likely to seek out weather and information related to specific risks and opportunities at the most granular level. are not limited to traders, however, and some brands and roasters that are more involved at a local level demand the same producer level information related to climate change.

Sources of climate change information are also similarly variegated across the types of companies interviewed. The more local the information needs to be, the more diverse the sources used to acquire the information.

Direct service providers are the least limited by their ability to find the right types of information. Given their presence at origin, they are already aware of major risks affecting the farmers in the short term. **Farmers are their most frequently mentioned source of climate change information. NGOs are also a source of local information, particularly as a complement to the agronomic information from the farmers**. None of the *direct service providers* interviewed mentioned suppliers as an information source as they are already locally embedded through a physical presence at origin or heavy involvement in the supply chain.

While the nature of most of the information which they accessed is short term, information about mid- to long-term risks are interesting if they have their own assets to protect at origin (e.g. plantations, nurseries, etc.). In other cases, they might seek out mid- to long-term information for the purpose of strategies related to building and maintaining relations with the farmers beyond one season. This mid- to long-term information might come from other sources such as backbone organizations, trade groups, web search, email listserv, research publications, internal surveys, consultants or the coffee & climate steering committee. This indicates the variety of sources that those most involved in origin level activities have to access in order to make informed decisions around sustainability programs.

Collaborators predominantly named partners such as NGOs and suppliers as key sources. These are their primary sources of information about farmers, as they do not have ground level personnel interacting directly at the producer level. Many of the same secondary sources for information mentioned by *direct service providers* companies were also mentioned by *collaborators*.

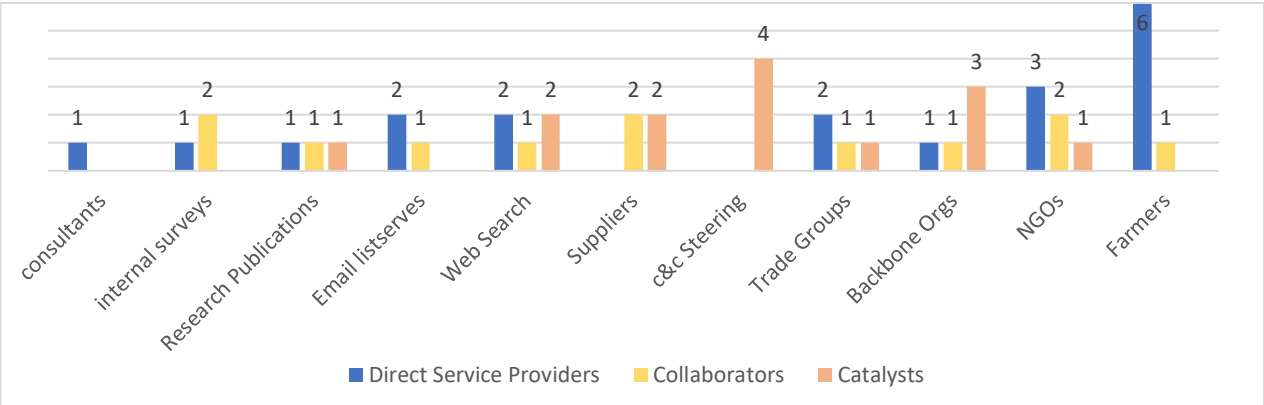


Figure 10: Source of climate change information by role of company (multiple choices allowed)

Catalysts receive all their information from other actors in the value chain (backbone organizations, trade groups, the coffee & climate steering committee, suppliers, and/or consultants) or from non-specific secondary sources such as web search and research publications.

For both *collaborators* and *catalysts*, traders are a main channel of information to help those further from origin to make sense of the complexity and competing priorities coming from

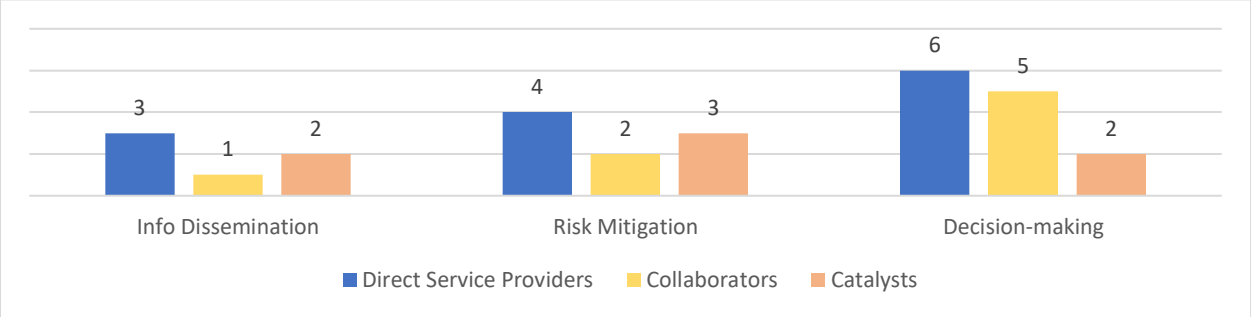
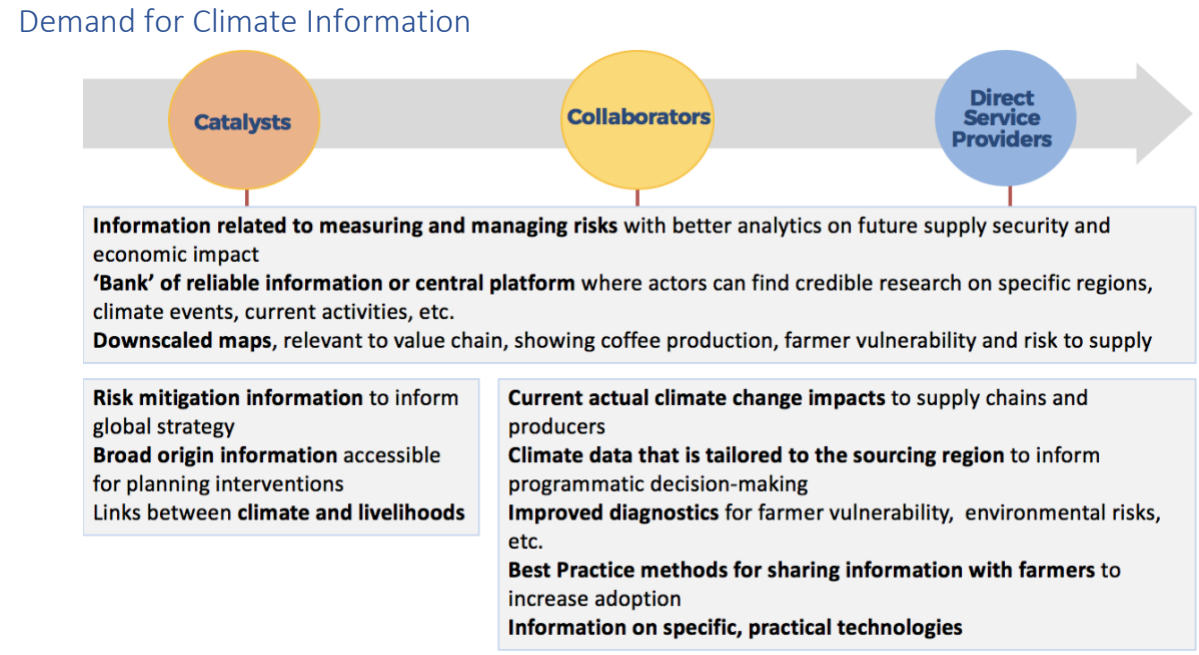


Figure 11: Use of climate change information by type of company (multiple choices allowed)

origin. Companies prefer to rely on the grounded, specific knowledge of traders rather than the research community for informing their activities. However, the information that traders channel down the supply chain is often of short-term nature given their focus. Information from the research community is thus valuable for mid- to long-term strategy determination and risk management.

Backbone organizations and web search were the only sources referenced by all three types of companies. This indicates **an important role for backbone organizations to serve as a dissemination channel for climate change information**, as well as their ability to appeal to a wide variety of companies' information needs.

"Resources need to be spent effectively. We note that several initiatives and platforms have been set-up within the coffee sector. Luckily a unification is taking place, allowing global awareness creation and sustainability action within the sector. The challenges are increasingly formulated in a more consistent and holistic way. Within this framework, EFICO's strategy consists of going for concrete action. For us, the impact achieved is most important." -Efico



There does not appear to be significant difference between roasters and traders with regard to use of climate change information. However, there is more of a difference between the groups based on their activities in the sector. Companies closer to producers such as *direct service providers* and *collaborators* want to know what the current and actual impacts to the supply chain and especially to the producers might be. They are generally more interested in the extrapolation and interpretation of climate information to know how to apply it to their programs and also help with

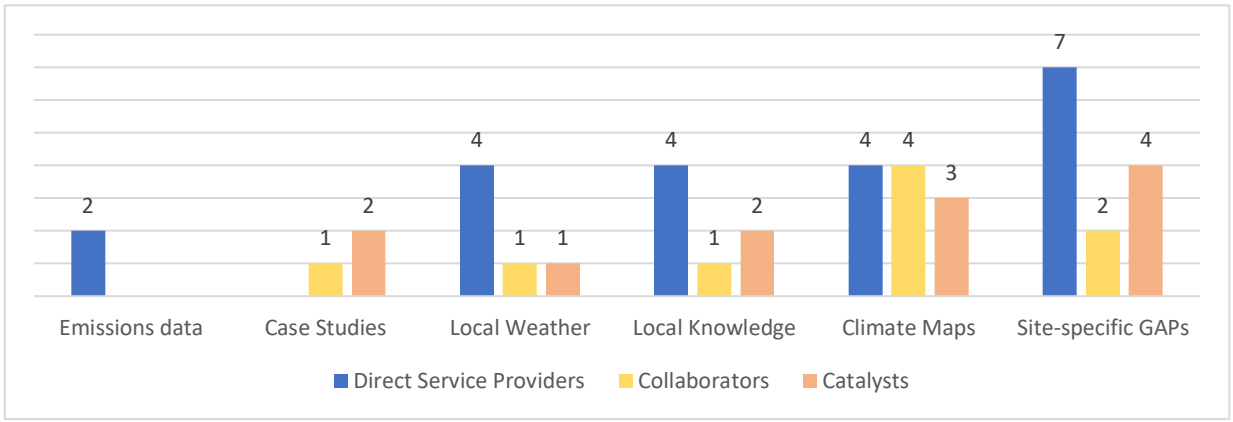


Figure 12: Demand for climate change information by role (multiple choices allowed)

decision-making and prioritization of interventions. Roasters and larger traders use climate change information to help make the case for action to their customers and/or senior executives, to explain the relevance of climate to their products. Lighter touch *catalyst* companies are primarily interested in risk mitigation and information that can inform their global programs and disseminate information more effectively to their peers and customers.

In addition to the source and use of climate change information, demand for missing information was collected from interview respondents. We would have expected to find that roasters are

focused on coordinated access to information in addition to content. And that traders would experience access to information as a less of a limitation because of their presence at origin. In fact, it seems that there are other factors beyond their position in the value chain that determine companies' demand for climate change information. A mix of roasters, traders spread across different company *roles* often mentioned similar information needs in the interviews, indicating that there are common needs for information with broad appeal.

Some of the most commonly mentioned types of information that companies demand are related to **information quality and granularity for improved diagnostics**. Specifically, some examples mentioned include defining where in the supply chain sustainability efforts should focus, adding farmer vulnerability assessments to climate change exposure maps, hydrogeological and water-related information that is local and reliable. At the production level, better emissions data and better detail on farmer economics beyond income to include production and financing costs are needed. Better qualification of information for reliability is also noted by one roaster as necessary to prevent spread of inaccurate, incomplete or even predatory information.

> *"What we're looking for is the actual impact of what we are investing in. There's all this money pouring into certification streams in these origins. We want to know what those dollars are doing, and how can we better direct them to have better impact on the ground." –Farmer Brothers*

Information related to **measuring and managing risks** is also frequently mentioned with regard to extrapolating climate change information to be more specific about near- to mid-term risk scenarios (e.g. as might be produced by insurance companies) and potential solutions for specific origins. This was mentioned by *direct service providers*, *collaborators* and one *catalyst*. *Direct service providing* traders, given their position closest to the farmers, are specifically interested in understanding the financial implications of risks to production, but also how their risk mitigating actions might affect outcomes. Direct service providers also demand information on the total investment required for an intervention and the expected benefit, in order to facilitate decision-making and prioritization of potential interventions.

The third most frequently demanded information relates to **specific, practical technologies** such as World Coffee Research trials, evidence-based locally-appropriate varietals in general, and thorough enough reference for intercropping sufficient to guide a farmer on exactly what varieties to intercrop, at what distance, and how management practices should vary. Direct service providers are almost exclusively the ones that mentioned they would have a use for such specific technologies. One *catalyst* also expressed interest in the information from the perspective of using it to inform priorities for their supply chain partnerships, in spite of their distance from the producers.

Ease of access to information is emphasized as an issue by seven respondents. These are the roasters, but also smaller traders who find that inefficiencies in searching for information which they generally need to access at irregular intervals. While large traders access and use information on a near-constant basis to feed crop production models, smaller traders seek information on an as-needed basis and do not maintain it in a formalized structure. These companies recognize that the information probably already exists, but their main constraint is related to access because it is difficult for them to find the information from disparate sources. Recommendations include to consolidate information on a single platform where companies can find research on specific

regions, climate events, current activities and key actors. There is also a need to improve coordination of information within such a platform so that the consolidation point is not simply a massive storage place that requires great effort and time to sift through. This appears to be a delicate balance to strike, as for information in a central portal to be useful, it must also be locally-specific, but not in too great a detail to overwhelm, in English language, and up-to-date with regard to the latest status and relevant actors. A few companies also noted that some locally-specific information on weather or water, for example, can be prohibitively expensive and would like to see a reduction in cost-related barriers to access such information. The suggesting by companies in this case is to enable access to the resource for free, but to charge for the service required to utilize it effectively within a particular sourcing region.

Five medium sized companies mentioned the need for **information to inform and educate**. Easy to digest information is needed to build awareness among peers and customers in the sector about the nature of the climate risks to coffee production. Examples given include evidence of what weather changes can be attributed to climate change versus "normal" weather variability and landscape level tools that give evidence of how climate change relates to specific actors. Also, case studies to illustrate practical information and lessons learned are noted as a powerful tool for raising sector awareness.

> *"There is not a good understanding among some customers of how climate change relates to them. We need to be able to explain what the baseline issues are and communicate it in a way that they can relate to." – S&D*

Information about **improving farmer outreach** and organization is noted by three small- to medium-sized companies in relation to their ability to effectively work with farmers. One *catalyst* company noted that better farmer outreach is needed by others in the supply chain, but that most roasters probably have sufficient information for their own purposes. One example of effective channels or methods to reach and equip farmers included improving understanding about what the next generation of cooperatives needs to evolve into to ensure better governance, financial acumen, risk assessment and ability to invest.

Companies heavily involved with backbone organizations such as coffee & climate and GCP want more **measurable impact indicators** to know how successful the initiatives are in addressing climate challenges. These companies need information on the impacts, costs and benefits to producers of specific adaptation solutions promoted by the platforms. One company recommends that without agreed-upon key indicators, there is no way for the sector to make coordinated steps forward toward the same objectives. A common set of impact measures would help define what qualifies as adaptive practices versus simply re-labeling good agricultural practices as "climate smart".

> *"Resources need to be spent effectively. We note that several initiatives and platforms are set-up within the coffee sector, and are getting more unified/uniform, which is very good news. Awareness and action with regard to sustainability is very vivid/vibrant within the sector. And the challenges are more and more approached in a more consistent and uniform way. Within this framework, EFICO's strategy consists of going for concrete action. For us, the impact achieved is most important." – EFICO*

Finally, with relation to **climate suitability maps**, companies of all sizes, types and positions in the value chain acknowledged the value of the maps in understanding dynamics of climate change

in relation to coffee supply. Recommendations on next generation mapping exercises include expanding the suitability maps to crops commonly found in coffee systems and shared landscapes (e.g. shade tree species or other crops coffee farmers might commonly intercrop or switch to in place of coffee). Some companies also note that higher resolution climate suitability maps at the more local, sub-national level would be useful for decision making and guidance on the local priority areas.

Ugandan National Case Study on Use of Climate Change Information

The Ugandan national case study on use of and demand for climate change information highlights the global study trend finding that those on the ground are more interested in production-level, short-term resources, which may or may not overlap with 'climate smart practices'. Farm level tools will ultimately be in the hand of national-level actors. Therefore, it is important to understand their priorities and tailor resources to meet their needs in order to increase uptake of climate smart agriculture practices.

Ugandan National Case Study[12]

In Uganda, a case study focused primarily on the access and use of knowledge by the private sector, with a distinct focus on climate change information. The results varied slightly in the terms of the degree climate change was an important aspect in their sustainability programs, yet the focus on climate change was on the short-term impacts on coffee. This need for short term information links to the perception that there are still production gaps in coffee between what is currently being produced and the potential yield. This same perception counts for the quality of the coffee being produced, as the quality could still be higher than it currently is. These production and quality gaps are arising due to the lack of adoption of the good agricultural practices (GAPs) and the broader climate smart agricultural (CSA) practices that are necessary to attain the potential production and quality levels in coffee. The demand of climate change information thus currently limits itself to the need for specific practices that farmers could implement now, in order to address the environmental issues they currently face, such as pro-longed droughts or flooding. This links closely to the findings in the global report, as the traders and other organizations are themselves direct service providers, or at least very closely linked to those that are.

> *"Climate change is something that is a concern in the long run, yet in the day to day activities in the field, the focus is on productivity, quality and meeting target volumes" - Olam*

Long-term climate change predictions are not a priority. The longer term projected impacts and their related suitability changes are of secondary or even tertiary importance for the private sector working on the ground in Uganda. Planning for the longer-term and the possible impacts that climate change brings with it, is seen on the whole as something to think about later or as something that the public sector has to deal with. During the questions on access to knowledge, the respondents were shown a pamphlet which discussed the projected suitability changes of both Arabica and Robusta coffee by 2050 in Uganda. An example of such maps can be found in Figure 1, which shows the suitability change for Arabica and Robusta coffee in Uganda by 2050.

[12] See Annex 2 for full methodology and study results.

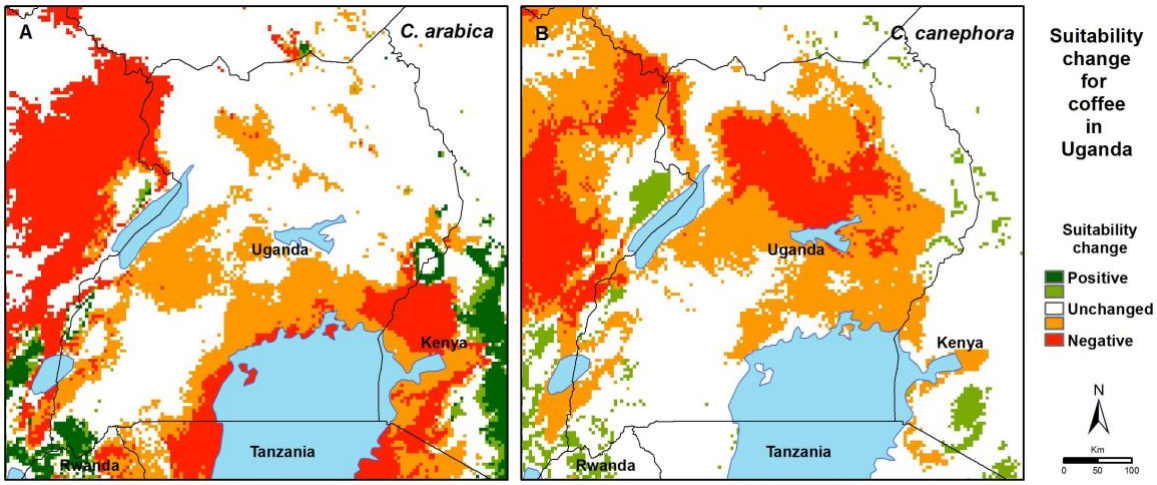


Figure 13 Suitability change for coffee in Uganda, between now and 2050 (Based on Bunn et al., 2015).

The reaction to suitability maps ranges from 'scare mongering' to 'yes, very interesting' (but not much more than that). The 'scare mongering' was raised as an issue by the larger traders, as there was a worry that such projections could cause larger multi-nationals to pull out of sourcing from Uganda, and in turn stopping support for sustainability schemes for farmers. The main reason was that in the current format the maps were too complicated, and that the focus should be on clear messages and keeping the message positive as something that could be dealt with, or that could even prove to be an opportunity. Medium traders also said it was interesting, but needed more explanation if it would be used for long term planning. The maps would prove useful at the higher levels of management in country, so as to identify clear contextually specific adaptations to service provision, yet only if the message the maps convey was clearer. Properly framing the implications and possible uses for the maps, or even removing the map and conveying the messages in other forms, is key in order to not adversely affect the engagement in the coffee sector in Uganda.

There were two key points that were raised in terms of access to climate change and wider knowledge that would be of benefit to the coffee sector. The first was a lack of appropriate media to easily digest the relevant information, as there were too many large reports and journal articles behind paywalls which hindered access. Breaking down findings of research into smaller, bitesize pieces using a wide array of media, such as video, audio, policy briefs, pamphlets will be key in getting information to the private sector in Uganda. A reaction to the suitability maps, especially the civil society organizations, that such media should be easily shareable, and not constrained to presentations at workshops and other meetings hosted by coffee sector actors. The second was a lack of an easily accessible central repository where information of interest to the coffee sector could be made available, which was also an issue raised in the global level findings. In Uganda, such a repository would include the harmonized extension service material for coffee, as well as other broader information that would be of interest to the coffee sector.

Recommendations for Tool/Resource Development

Recommendations from the industry on the missing and most useful climate change information focuses on the tools or pieces of information that are seen as having the most potential for impact on the sector and to fill missing gaps. In general, many of the recommendations from those closest to farmers focus on the need for interpreting research into actionable and practical diagnostics, risk assessments and technologies. Actors farther from the farm level are more likely to note the need to facilitate access and better coordinate existing information. Medium and small companies with smaller footprints at origin tend to be more interested in educational tools that drive awareness of the scale and applicability of climate change risks to peers and customers in order to prod the sector as a whole into action. Specific examples of these information gaps are listed in Table 3 below.

Demand for missing information and tools	
Better diagnostics	• Define where in the supply chain sustainability efforts should focus • Identify the areas where coffee is contributing to environmental stress such as biodiversity, water stress, deforestation • Extend climate change exposure to include a review of farmers' vulnerability to climate change (i.e. sensitivity and adaptive capacity) • Details of farmers' production costs, financing costs and net income • Better filtration of information to be trustworthy and reliable • Hydrogeological and water-related information and analysis that is local and reliable • Emissions data on production level
Risk management tools	• Extrapolation of climate risks to be more predictive of risk scenarios, especially in near- to mid-term • Direct or indirect financial implications of production risks and solutions at origin • Analysis of how outcomes might change based on risk mitigating actions • Quantified investment required for an intervention and expected benefit
Practical technologies	• Thorough and specific reference for intercropping that can provide the farmer with specific, hands-on advice • Breeding and testing of more resilient and locally-appropriate varietals • Practical tools and actionable guides for producers
Ease of access	• Consolidate information into a single source to know what initiatives are underway and where to find key resources and actors • Improve coordination and interpretation of information in addition to simply gathering and storing • Improve access to locally-specific information, ensuring reliability and availability in English (e.g. locally-appropriate coffee varietals, shade tree species) • Reduce barriers to access information by making it freely available, or at least cost-effective
Awareness building	• Landscape level tools to provide evidence of how climate change relates to specific actors • Information on the difference between "normal" weather variability and what can be attributed to climate change • Lessons learned and practical information from applied case studies
Farmer outreach	• Improve support to formation of the next generation of cooperatives based on improved governance, financial acumen, risk assessment and ability to invest • Effective tools, channels or methods to reach and equip farmers
Impact	• Quantification of the effects, costs and benefits to producers of specific adaptation solutions proposed or implemented • Measure impact of how coordinated initiatives and platforms such as coffee & climate, GCP are succeeding in addressing climate challenges
Maps of climate suitability	• More context to the climate suitability maps needed in order to know the probability of certain conditions developing in the short term • Climate suitability mapping for crops that are found in coffee growing areas and systems • Climate suitability maps at the sub-national, more local level

Table 3. Demand for missing climate change information and tools

With regard to format of climate change information, recommendations from the companies indicate a general preference for brief, **concise and simplified analyses** that can be easily digested within minutes. Beyond that, leverage of non-written mediums such as infographics, videos, and other digital technology to communicate rich visual detail in small information packages needs to become a more commonly used, mainstreamed communication tool.

Some companies also have recommendations to **better target information to specific audiences based on their level of involvement at origin, or better coordination between platforms to streamline access**. Some also find that in-person exchange and open channels for personal communication are still the most effective way to share information and develop collaborative solutions. See Table 4 below for specific recommendations shared by the companies.

Preferred format for climate change information	
Do's	**Don'ts**
Bite-sized information that is as easily accessible as possible	White papers or case studies can be too long and poorly organized
Infographics, short videos or short reports heavy on the pictures	High production standards for videos and infographics prevent them from being mainstreamed as a communication tool
Graphs showing trends and other visuals are able to relay a lot of information concisely	Detailed, text-heavy analyses risk being overlooked entirely
Use digital technology that can make it easier to relay down to the producer level	Viewing the companies as final recipients of information (particularly technology-related) raises a barrier to dissemination by requiring the extra effort for each direct service provider company to individually process the information into a format that can reach farmers
Identify key points for engagement depending on company type. *Direct service providers* and *collaborators* with farmer programs should be more heavily involved, while *catalysts* may only need to be kept in the loop	Indiscriminate broadcasting of information to all industry actors risk overwhelming those for whom the information has no relevance
Adapt information exchange channel to the audience. With producers, the easiest ways are the best ways (e.g. WhatsApp)	Formal dissemination channels are not always suited throughout the full supply chain
All information needs to be in practical terms and must provide immediate benefit	Recommendations to producers that are not going to pay off right away or are high risk will not be taken up
Coordinate different sources of information to be able to provide a 'so-what' summary that enables audience to make decisions without excessive additional research	Pure documentation and information storage results in information overload, preventing information from being properly utilized
Knowledge hub or learning platform programs are linked together. Where one can go when developing an approach for a specific origin, specifically around where to get information, who should be involved, who are the local experts and stakeholders to contact for information about specific issues	Disparate sources of information decrease efficiency with which smaller sustainability teams can design informed programs
Affiliate with and work in collaboration with existing platforms and backbone organizations	Lack of collaboration or even over-estimation of competitive nature of information prevents effective sharing of information and the resulting synergies
Physical events with peers or at least an open channel of communication to organizations that are knowledgeable on these topics and to whom they can go to access information on an as-needed basis. Ongoing support, relationships and in-person interaction is important.	Reliance on purely formalized channels would prevent the sparking of information exchanges that happen in physical meetings or over longer-term relationships
Freely accessible data, the business offering can then be in the service of interpreting data and helping to strategize around it	Prohibitively expensive data creates barriers to informed decision making, but also to partnerships and collaboration by increasing competition for data

Table 4: Preferred format for climate change information

Drivers for Decision-making

The private sector has a range of different priorities for engaging in climate smart agriculture activities and strategies. Corporate priorities are generally reflected in the company's processes, influencers and decision-making processes and range from securing a sustainable supply to minding brand reputation. Priorities are also determined by the company's ability to take a short-term or long-term view of sustainability efforts. Those working closer to the ground as *direct service providers* are often more focused on a full sustainability/productivity strategy rather than one specific to climate. Those that are further up in the chain, and especially those with less stockholder pressure, are able to take a slightly longer-term view, enabling them to focus more on climate resilience and mitigation. In all, many of the companies lamented the short-term cycle of funding and need for quick results that neglect to take into account the time needed to truly build resilience.

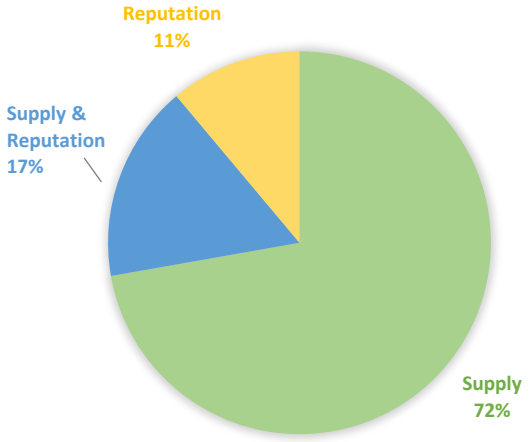


Figure 14 Primary reason for CSA Investment

"Short term price fluctuations are due to the trade - stocks, speculations, etc. Long term price trends are affected a lot by climate change."-Strauss Coffee BV

Overall, there was an almost universal focus on **security of supply** in the interviews as the rationale for investment. This is in contrast to the CSA Learning community interviews done in grains, cocoa and other crops, where we often saw more of a mix between reputation and supply. In general, we have found the coffee industry to be further ahead and more organized than some other smallholder sectors such as cocoa, in their conversations around and approaches to climate change resilience. It is possible this is simply due to the nature of the crop and the higher sensitivity to rising temperatures of Arabica coffee.

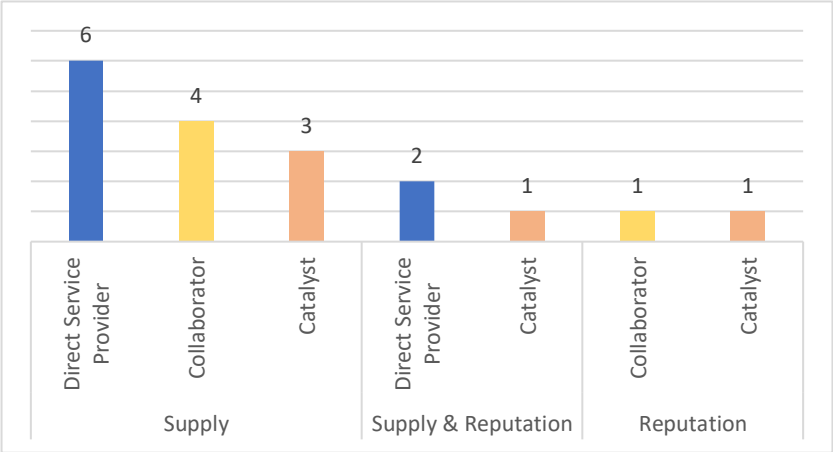


Figure 15 Corporate Priorities by type of company

"You don't get to keep your supply chain because you built it 20 years ago. Climate smart agriculture, farmer financing, modern agronomy, and technology… these are all part of what it takes to stay in business." -Sucafina

Several companies mentioned that they had already seen supply affected, and companies only varied greatly in the perceived risk to their own company (bigger companies able to change sourcing origins and those further from smallholders who depend on contracted suppliers were generally less concerned for their immediate bottom line and more concerned about supply 20-30 years in the future).

Where companies were interested in visibility and reputation, this was sometimes in relation to other companies in the value chain, not necessarily just to end-consumers. Several companies noted that a key driver for them is calls by their clients to implement their climate smart agriculture activities (for instance *direct service providers* being contracted by *collaborators*). As such, their reputation in being able to implement such activities effectively was very important. Companies that are driven to action by supply concerns will often see their good work as an opportunity for promotion, even if it is not the primary driver.

"If we want to grow our business and increase market share, we are relying on empowered farmers who are running viable farms. For this we invest a lot into our supply chain through our agronomist network and we need to also make sure that we are earning credibility for that." - Nestlé

However, there was little reported demand for climate smart activities from the consumer. And, in fact, a few companies expressed a desire that their customers be more knowledgeable about the risk (even engaging in education programs through social media and packaging inserts) to support and justify climate resilience activities.

"There is not a good understanding among some customers of how climate change relates to them. We need to be able to explain what the baseline issues are and communicate it in a way that they can relate to." –S&D

Those companies that did cite end-consumer brand reputation often described this need more in terms of wanting to know that they are buying from an "ethical and good" company, rather than being engaged with the specific projects and activities related to global challenges such as climate change.

"It depends on the market. In [our] market, consumers are not strongly interested in social responsibility or certified coffee. What's very important is that they trust [us] as a responsible company" - Lavazza

Regardless of the reasons stated for sustainability investments, several companies were quick to point to the fact that no matter the passion they have for climate change resilience and sustainability, they are for-profit entities and always have a bottom line. It is important for the research, NGO and government sectors to remember that all decisions hinge on profit to a certain extent (depending on the company, the flexibility of their sustainability unit, flexibility in their ability to switch origins, and their ability to look long-term vs. short-term) and should be approached with that in mind.

"We never look one-sidedly at a project. We try to apply a triple bottom line approach, so it has to tick a few different boxes. We're not an NGO so [any project] has to deliver commercially, and also have social impact and have impact on the environment as well." – Union Hand Roasted Coffee

Influencers

In addition to being driven by security of supply or reputational demands, companies are influenced either by bottom-up or top-down processes. Those whose climate activities stem from the ground up look to their producers and/or their clients in determining what types of climate smart activities to implement and where they are needed. This group is overwhelmingly made up of *direct service providers*. Those whose climate activities stem from the top-down, look to corporate strategy, either in terms of best supporting their stated business model or aligning with company values. *Collaborators* and *catalysts* were more likely to fall into this category.

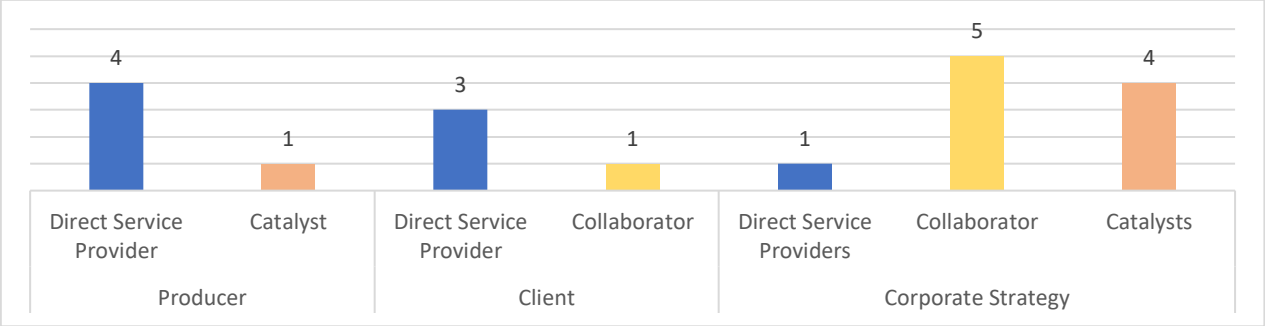


Figure 16 Influencers driving climate smart agriculture activities

Producer Loyalty Driven Decision-making

For those with direct trading relationships as a business model or who are less flexible in their ability to change suppliers and origins, decisions are largely driven by the challenges faced by producers on the ground. Four *direct service providers* and one *catalyst* (who is unique in that they work particularly closely with their supply chain on the ground) state that climate smart activities are heavily influenced by the needs of their famers. Companies whose business model is

to have long-term trading contracts with producers rely heavily on the producers' ability to remain productive for a long period of time. Other, smaller companies, note that because of their size and lack geographic reach, they are less flexible in their ability to source from other areas, unlike larger producers who rely on being able to switch origin as a risk mitigation technique. These companies that are less able to shop around are more likely to prioritize climate change resilience efforts in direct response to producers as they feel supply risk much more acutely. This is applicable as well for any company that controls assets, such as coffee plantations, as owned assets are exceptionally hard to move or divest from, they are investments and are cared for to a greater degree.

Client Driven Decision-making

For those that supply coffee to other companies either for roasting or sale, climate smart agricultural investment is driven largely by their clients. This group is made up of three *direct service providers* (two of which are the only direct service providers which name corporate priorities as both reputation and supply) and one *collaborator* (who cites corporate strategy as well as clients). Each of the companies that falls into this category are in a position to respond to clients' needs as they are implementing for clients, and focus first (but not exclusively) where clients ask them to focus.

Corporate Strategy Decision-making

Those that are further from the smallholder are more likely to cite corporate strategy and leaders as major influencers for climate smart agriculture activities. Five *collaborators*, four *catalysts* and one *direct service provider*, fall into this category. There are two main categories of companies that look to corporate strategy: 1) those companies that are farther away from the smallholders in the chain and make decisions based on their business model and overarching strategy, and 2) those that for a variety of reasons align activities with a defined set of corporate values that prioritizes sustainability or climate smart agriculture.

Those that cite corporate strategy as a driver, looking to support their business model, are generally those that rely on stand-alone departments and budgets to implement programs or run initiatives. They rely on executives or sustainability department staff to look at the bigger picture, more likely gaining insights from broader climate information and tools that can help them to ascertain risk across their supply chain, to implement strategies that will help to support the business model.

Those that align activities with their given corporate values fall into two special categories (although other individual companies also fit this mold): family companies and specialty companies.

Three of the companies that are family owned or who still have a controlling stake of the company cited being a **family company as a driver of their climate smart activities**. Those working at these companies felt a longer-term perspective than their competitors. This may be because the general reputation is more important to family-run companies or because there is more stability/flexibility in a family run company that has to worry less about shareholders. These companies also mentioned that when family members feel passionate about a certain issue or feel responsible for doing their part, the company follows their lead.

"It's a simple answer. We are exploiting the assets we have as a family company. Some of the family members are very interested in this issue – together they have developed this approach. Once it is clear is a priority, it is very easy to move forward and make decisions." -Lavazza

Certain **specialty companies feel a particular responsibility** to support farmers' resilience and larger initiatives to adapt to climate change because they were founded on values of responsibility to smallholders and sustainability and/or depend on specific origins to provide a specific flavor profile and quality to their customers. These specialty companies range in attributing their action to different degrees to supply or reputation. Many end-consumers are loyal to these companies both for their unique and quality taste as well as their values. Small specialty companies attribute their actions almost completely to security of supply and not to reputation. And, in fact, because many of these companies fall into the category of companies which are less able or willing to switch origins due to the unique flavor they offer, they are more at supply risk than others. As mentioned above, while larger or non-specialty companies can mitigate risk by blending or switching supply, smaller companies are often unable to do so while upholding their business model.

"Climate change has affected supply already with La Roya across Latin America, and we're very conscious about this challenge. This is seen as a constant risk to our partners, but it has also demonstrated the strength of our relationships -- seen by our roaster networks willingness to work through the issues and not simply switching from one coop to another, but a strong desire to continue relationships with current partners)." –Coop Coffees

It is worthwhile to note here that there are cases in which these influencers can change, shifting the priorities of the company as a whole and its climate smart agriculture activities. For instance, in the case where a company is acquired, sustainability departments may be restructured and/or priorities shifted, as we see is part of the history of several of the companies interviewed. More information on mergers can be found in Table 1.

Sustainability Team Positioning

Sustainability team positioning within a company can provide insight into the relative influence of those working on sustainability or climate resilience. Those that are making decisions around climate smart agriculture that are integrated into the procurement or sourcing generally have more influence in day-to-day activities and may have more stable budgets attached to operations rather than a separate sustainability budget. Integration in the procurement/sourcing team also indicates the extent to which sustainability is a central part of the business (either because it is a part of everyday business or because it is a key element of the corporate sourcing and/or branding strategy.

"We don't have two strategies. Sustainability is built into the business strategy, and in our case it is based on the values and heritage as a family-owned company. In the long run, I think that's how most companies will run it as sustainability thinking is crucial to long-term success." -Paulig

There is a greater level of uptake of climate smart programs and focus on sustainability when the sustainability team is embedded with the sourcing team than those where it is separate. It is important to note here that sustainability teams can be separate within the management structure and in title but still be very integrated with sourcing teams with the same effect. Those that are not integrated often have less on-the-ground knowledge and less influence on day-to-day decision-making.

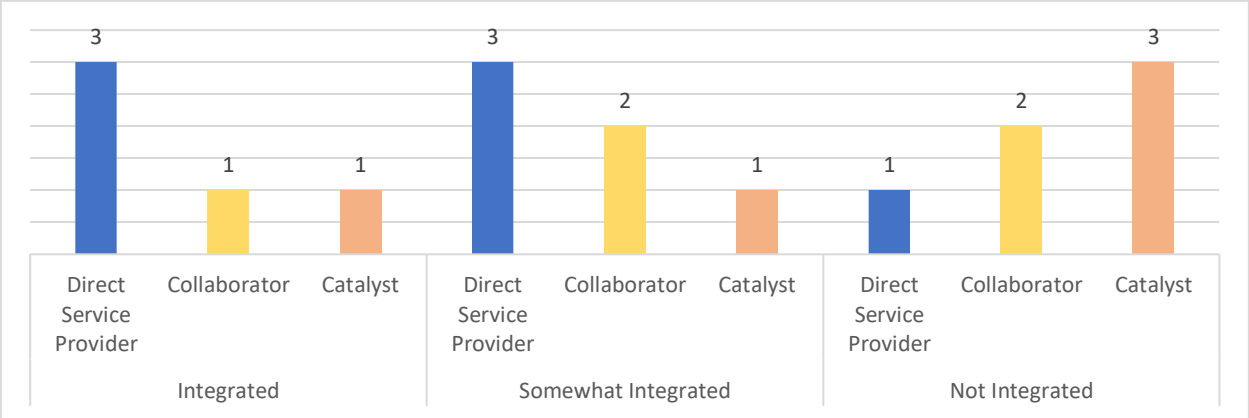


Figure 17 Integration of Sustainability Team/Procurement/sourcing

There is a link with very well integrated sustainability teams and their role as *direct service providers* or *collaborators*. For these roles, decisions are driven largely by which producers are in the most need of support and/or which buying clients are calling for climate resilience activities in a bottom-up fashion. For those who are focused further up the chain (i.e. *collaborators* and *catalysts*) decisions are often (but not always) more informed by corporate strategy in a top-down fashion.

Sustainability leads in embedded teams appreciate the advantage this gives them in terms of understanding the organizational capacity of their business within each origin and the on-the-ground knowledge needed to prioritize certain activities or areas over others. Companies that are well integrated and working closer to the ground already have detailed information about their supply chain and if supplying direct farm services, detailed information on origin. More than overview information, they are more likely to have very specific data requests with regard to climactic risk and targeted responses in specific growing areas.

Varying views within companies

A methodological challenge of interview-based studies is the diversity of views within any organization, and companies are no exception. The relative weight and importance of any topic depends partly on who you interview and their position within the company. Global staff will typically focus at high level – their overall sourcing portfolio and will focus on their strategic outlook, reputation and competitive advantage.

Interviews at the national or sub-national level deliver different responses, the closer to the origin you get more short-term focus and need for specific, practical information for farmers.
Those that work more closely at origin are more inclined to look at security of supply since they are often responsible for building relationships with farmers and securing supply each season.

Staff working more closely with farmers are more likely to see adaptation as the next challenge to securing a sustainable supply, incorporating practices into current programs aimed at building farmer resilience, and improving productivity or quality.

Major Takeaways + Implications for ARC Consortium

All of the companies interviewed have sustainability programs and are touching on (or thinking about) climate smart agriculture in one form or another. The key to successfully approaching companies and successfully tailoring tools and resources to their needs is to understand the role of climate smart agriculture within their business model and sustainability strategy, their motivations for investing in climate smart agriculture and the types of tools and resources that would most benefit them. We heard from 18 coffee companies (traders and roasters) about their current programs, initiatives, and roadblocks; demand and use of climate change information; and drivers for decision-making to provide an overview of private sector commitments, approaches, and needs regarding climate smart agriculture.

In our conversations, we found more alignment among companies who played similar roles chain (direct service providers, collaborators or catalysts) or in some cases who were of similar size, than based on their position in the supply chain as a trader or roaster. Below are the key findings to help shape tools and resources to the needs of the private sector.

1. Confusion over what is "climate smart" especially for those working close to the farm level

There is an ongoing challenge in language that a number of core 'sustainability' investments are focused on holistic services that in some cases can also be considered 'climate smart,' however are not classified as a 'climate program'. Working close to the farm level for many companies means addressing the most urgent problems first, (such as helping farmers to run their production as a business), which do not always include longer-term challenges associated with climate change. Often their long-term thinking concerns making coffee production an attractive option to secure a next generation of coffee producers.

There remains some confusion on exactly what climate smart agriculture is and how it relates to other current programs and strategies such as adoption of good agricultural practices, renovation or rehabilitation and financing mechanisms, etc. This confusion was evident in both the global interviews and the Uganda national findings. The consortium would do well to clearly define and explain CSA to those they are approaching with tools/resources.

2. Depending on the company role as *direct service provider*, *collaborator* or *catalyst*, they have access to and use for different types of climate information.

More direct service providers have use for ground level information such as site-specific GAPs, local knowledge (hydrogeology, shade tree species), local weather, cost-benefit analysis and production-level emissions data. In contrast, collaborators who work primarily via consortiums and partnerships with traders, and catalysts are interested in, but do not always have a practical use for detailed producer-level information and also rely on or would like to see climate maps, site-specific GAPs and case studies on successful, cost effective solutions and approaches that can inform a broader strategy.

3. Size matters

Almost all the medium to large companies (traders as well as roasters) have participated in multi-stakeholder initiatives. The small companies tend to stick to their known partners, mainly farmers and suppliers, and look for further support or alliances (mainly regarding research) on specific

topics they cannot cover internally but are typically not able to fund these activities. This points to the need to deliver climate information in different ways through various platforms to ensure the whole range of actors can act on climate change.

4. Information needs to be easily accessible and usable

For information to be used it needs to be the right information in the hands of the right people. Most sustainability investment decision-makers have little time for lengthy information searches or to sit down and read a longer paper that in the end may not be useful for them. Central platforms for resources/tools that are well-labelled and easy (and free) to access, that are also easy to digest and use would help uptake.

Sector organizations (intended to coordinate and inform sector-wide initiatives such as the GCP and SCA) and web searches were the only sources referenced by all three types of companies. This indicates an important role for sector organizations to serve as a dissemination channel for climate change information, as well as their ability to appeal to a wide variety of companies' information needs.

5. High demand for information/tools that are specific to the area in which a company is working

For tools and resources to be most helpful they must be relevant to local conditions, contexts and/or customs. Specific information about climate effects in a particular sourcing area and corresponding tools for adaption/resilience/mitigation are seen as very useful.

6. There are some common specific requests for tools & resources across the companies interviewed

- Improved diagnostics
- Information related to measuring and managing risks
- Information relates to specific, practical technologies
- Climate suitability maps, both large scale and tailored to specific geographies to understand the dynamics of climate change in relation to coffee supply

7. Better collaboration and longer-term investments are needed

Many of those interviewed expressed worry for the long-term sustainability of coffee due to climate change and called for a better solution to the problem than the shorter-term focus. Those in sustainability positions see the need for pooling resources for greater impact and work together on longer-term solutions to affect change. However, this does not usually align well with business models and funding cycles. At the same time collaboration needs to be made more efficient according to the interviewees. Stakeholder management takes up a lot of resources, that could rather be directed towards achieving impact at production level.

8. But, profitability comes first

Companies first and foremost are for-profit entities. They may see the need for longer-term solutions, but have to work within budgets and ensure they are meeting short-term financial goals as well as securing a future supply of coffee. Robust economic analysis that can tie current and projected climate changes to economic impact will enable companies to connect the needs for climate adaptation and resilience to their bottom lines.

Annex 1 – Interview Guide

Corporate Typology Interview Guidelines

Due to the differences in knowledge and experience of the interviewees these guidelines may be adapted slightly in the course of data collection.

Internal Interview purpose: *To learn about climate risk perceptions and climate resilience strategies being used by different types of companies in supply chains based on smallholder coffee farmers.*

Date	
Begin	
End	
Interviewer	
Company	
Name and official job title of interviewee	
Remarks on interview situation	
Further comments / main points	

Introduction:

- Introduce yourself and the context of the interview
- Explain how information of the interview is being recorded: taking notes / audio record…
- Affirm confidentiality – no information will be shared publicly, with company or individual's name, without permission
- Ask for any open questions on the interview and point out that it will take approx. 60min.

Note: Question does not need to be asked if company was part of the CI SCC Sustainability Study. Instead ask the question in red (where applicable). Everything in blue is guidance for the interviewer and not to be shared with the interviewee.

Opening statement: We will focus on climate change and what that means for your company – especially in regards to supply. You may have heard about Climate Smart Agriculture. In our case, this means, that coffee production practices consider changes in the local climate and / or food security and / or greenhouse gas emissions. If we speak about climate resilience, this is what we refer to.

1. Experience and plans

Purpose: *Understand how the company interacts with its smallholder farmers and how they approach equipping their smallholder farmers with the tools and resources they need to build climate resilience.*

- Do you work on climate change? If so: Where in the chain do you focus climate change activities and why? If not: Why not?
- What kinds of activities / smallholder climate resilience initiatives have already been

started?

  - **Probe:** With regard to your (Sustainability Program], what role does innovation play in your strategy development? Do you believe that your organization, relative to other companies has a strong focus on innovative approaches to smallholder climate resilience?

- How do you address the topic and what action is carried out by you / by other chain actors / by service providers? Are you working with partners? If so, why are these the preferred partners? We see from the Conservation International survey that you list partners as [Name Partners]. Why are these your preferred partners? (indicates preferences and priorities for specific roles within multi-faceted interventions)
- Within your supply chain, how much responsibility falls into your hands to equip the smallholder producers in your supply chain with the tools and resources they need to face climate change? Depending on answer: Who makes decisions about climate change interactions and investments? (indicates distance to smallholders)
- Do you believe your organization has an effective plan, relative to other companies, for supply chain sustainability in terms of climate resilience? If so: what makes it effective / more effective than others? (indicates whether a business perceives themselves as relatively early or late adopters)
- What have been some of the roadblocks to your involvement in issues of smallholder climate resilience? Have you tried activities / approaches in the past that worked well / didn't work? What were lessons learnt? (identifies possible incongruences between corporate priorities and active initiatives)
- Do you have any plans for future activities – if so, pls describe? Would you like to do more / different activities? If so: do you have all mechanisms, tools etc. in place or is there anything else you may need?

2. Demand and use of climate change information

Purpose: *Where do companies obtain climate resilience information and how do they use it? How could we make information like this easier to obtain and use? (primarily useful for informing outputs of our work as opposed to defining the corporate typology)*

- What type of production-related information and analysis do you need to access?
  - How often / frequent do you need to access such data?
  - Where do you go to access this information (if no answer: "for instance, coffee & climate")?
- How do you use this information in the work that you do?
- What information or resources are missing, or what topics would you want to learn more about?
- In what format would you prefer to consume this information?

3. Processes and decision making

Purpose: *Understand the internal workings of the company's approach to climate change. Who are the key actors and how do they interact with the rest of the company?*

- Describe for us the decision-making and priority setting processes and key players within the company.
    - **Probe:** Where do the climate activities sit (e.g. separate department, part of sourcing, separate foundation...)? To whom do they report? (e.g. sourcing, finance, a foundation, directly to the board...)? (indicates how distribution of responsibility within the company might influence corporate priorities)
- How is your department involved in the decision-making process? (gives context on respondent's perspective)
- Who mainly works on sustainability aspects? Is that their only work package or do they have other tasks? Is anyone else (encouraged to) work/ing on the topic? Who are the sustainability champions outside of the that team? What are their concerns? (identifies any other key influencers)

4. Corporate priorities and resilience investment rationale

Section Purpose: *Understand if corporate climate priorities lean more toward a social reputational rationale or sustainable supply rationale and how smallholder climate resilience actions are motivated in the company.*

- What are the significant origins from which your business sources coffee]? (indicates presence of any origin-specific risks)
- How does your business think about supply chain sustainability in the face of climate change?
    - **Probe:** What are the biggest challenges or opportunities related to climate change that cause your company to think about supply chain sustainability? (indicates relative weight of focus on cost savings, regulatory compliance, brand reputation, or long-term security of supply)
- How would you describe the main motivations behind the senior management teams' interest in issues of supply chain / smallholder climate resilience?
    - **Probe:** How important to your organization is visibility in issues of supply chain/smallholder climate resilience? Do you consider your company to be a leader in the field? (indicates importance of social reputation)
        - Why?
    - **Probe:** How likely is it in the near to mid-term future that an inability to procure a sustainable supply of quality product at an affordable cost due to lack of climate resilience in your supply chain will disrupt your business model? (indicates importance of sustainable supply)
        - If likely, how disruptive will it be?

Annex 2 – Ugandan Case Study

Expanded methodology[13]:

A series of semi-structured, qualitative interviews were conducted in Uganda in the last quarter of 2016. The interviews aimed at capturing a sample cutting across the diversity that is represented in the coffee sector in Uganda. The interviews were with representatives from three local branches of big multinational trader, two medium-sized coffee companies, one farmer cooperative, two civil society linked to a trader and two NGOs/Institutes set up with private sector support. Each of them followed a formal interview guideline, yet this was not necessarily followed strictly to allow the respondent to speak freely and for possible extra information to be elicited. However, within each interview the questions in the guideline were all answered. At the start of the interview, a short description of the study was given, and they were asked to sign an informed consent form (both for the use of data in general, and to allow for the interview to be recorded). Only two interviews do not have audio recordings: one because it failed (was done through Skype) and the other because the respondent did not consent. During the interview, during the questions on access to knowledge, the respondents were shown a pamphlet which discussed the projected suitability changes of both Arabica and Robusta coffee by 2050 in Uganda. These maps were generated by CIAT, and are local contextual adaptations of the work and maps generated by Bunn et al. (2015). The respondent was then asked whether such information is useful to them and whether or not this was a good example of a format that is useful to them. The analysis of the data was done through a systematic analysis of the interview transcripts, audio recording, and notes from interviews where there was no audio. Comparison between the interviews was possible due to the key set of questions from the interview guidelines being asked to all of the respondents. The interviews are supplemented by observations and interactions with a wide range of coffee sector stakeholders, during workshops, coffee sector breakfast meetings, and informal and formal meetings.

Interview guideline:

Background:

1. What is your name?
2. Which company and/or foundation do you work for? Who do you work for?
3. What is your title/role within the company/foundation/etc.?
4. What are your responsibilities?

Main round of questions on the access, use and framing of climate change information.

5. How do you see the current practices in the coffee sector with regards to improving coffee production?
6. What are the main challenges faced in the coffee sector with regards to coffee production?
7. What are the main opportunities in the coffee sector with regards to coffee production?
8. What are the main opportunities in terms of trading coffee in the coffee sector?
9. How will the current practices affect the coffee production in the near future?
10. Where do you/does your company gain access to relevant knowledge? What type of knowledge are you looking for?
11. In what form is this information useful to you?
12. Are there gaps missing in the knowledge?

[13] For more information on the complete study, please contact Onno Giller at o.giller@cgiar.org

13. Who do you talk to about the issue of Climate Change and/or Sustainability? Is there a consensus?

Note: although these questions are rather open in terms of information, if they do not voluntarily mention climate change or sustainability information/knowledge in their questions, follow-up questions will ask if they have access/use/need such knowledge.