Brewing Resilience: Shielding Coffee Farmers Against Climate Risk

An innovative industry-led initiative specifically designed to protect smallholder coffee farmers from climate disasters by creating tailored financial solutions that enhance their resilience

Disclaimer

The draft document aims to start meaningful discussions across the industry about a proposed program that aims to protect smallholder coffee farmers from climate disasters.

Please note that this document is still in draft form and should not be cited.

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Executive Summary

Coffee production is highly vulnerable to climate fluctuations that affect flowering, cherry development, and harvesting. Drought, excessive rainfall, and high temperatures can significantly reduce both yields and quality, threatening farmers' incomes and livelihoods. Climate change does not only affect smallholder coffee growers but also impacts the entire coffee supply chain. A climatic event can disrupt growing conditions, leading to inconsistent coffee supplies and resulting in volatility in market prices, which affects the entire supply chain.

As climate variability exceeds the capacity of smallholder coffee farmers—who often lack the resources to manage these risks—there is an urgent need for tailored financial risk transfer solutions to enhance their resilience. Current voluntary sustainability standards, such as Rainforest Alliance and Fair-Trade certifications, do not adequately protect rural livelihoods after disasters, particularly for coffee farmers facing climate change and extreme weather.

This new industry-led initiative proposes the Coffee Climate Protection Certificate, aimed at securing the livelihoods of vulnerable coffee farmers by providing tailored financial solutions. More importantly, the initiative seeks to offer financial protection to farmers, enabling them to reinvest in their farms and ensuring that traders and roasters receive a reliable and adequate supply of premium coffee. Furthermore, the Coffee Climate Protection Certificate program aligns well with other initiatives, such as corporate social responsibility (CSR) programs and foundations, which promote social responsibility and sustainable business practices. The Coffee Climate Protection Certificate is designed to be flexible. Depending on the needs of the coffee industry, the program

can function either as a standalone initiative or as an addition to existing standards, such as the Rainforest Alliance. This approach could help make it more cost-effective.

The initiative proposes integrating coffee climate protection certificate program with the existing sustainable coffee purchase initiatives to shield coffee farms from climate disasters. The costs associated with climate insurance—including premiums and implementation expenses—are passed on to consumers purchasing coffee from climate-insured farms, similar to certified coffee programs. Examples suggests that a price differential of USD 13.2 per metric ton would be sufficient to cover the costs and premiums for insurance. Given the sustainable coffee program, which attracts an average price differential of USD 80 per metric ton, a price differential of USD 13.2 per metric ton or even higher is easily attainable.

By encouraging investment in climate-resilient practices and providing financial support after an extreme climate event, this certificate could play a crucial role in fostering resilience within the coffee industry and ensuring its sustainability in the face of climate change. It is also vital to promote knowledge sharing and capacity building among stakeholders regarding insurance mechanisms to maximise benefits for the industry both in the short and long term.

Background

Coffee production is highly vulnerable to climate fluctuations, affecting stages such as flowering, cherry development, and harvesting. While drought directly impacts coffee yield, excessive rainfall and high temperatures can lead to lower yields and poor quality, diminishing the market value of coffee and threatening farmers' incomes and livelihoods.

As climate variability surpasses the capacity to manage its economic impacts through various risk management solutions—particularly for poor household coffee farmers, who often lack the preparedness and financial means to cope with these climate risks—there is a pressing need for tailored risk management solutions, particularly those focused on financial risk transfer. Implementing these solutions is essential to enhance the resilience of vulnerable coffee farmers.

There are several initiatives, such as Rainforest Alliance certification, 4C (Common Code for the Coffee Community) and Fair-Trade certification, that focus on industry sustainability and primarily aim to reduce environmental footprints. Furthermore, it is important to note that none of the existing initiatives adequately address the need to protect rural livelihoods in the aftermath of disasters. This is particularly concerning for coffee farmers, who face significant challenges stemming from the dual threats of climate change and extreme weather events.

This is the first industry-led initiative designed specifically to protect smallholder coffee farmers from climate disasters by developing tailored financial solutions that aim to increase their resilience.

At the core of this initiative is the Coffee Climate Protection Certificate, which aims to safeguard the livelihoods of millions of vulnerable coffee farmers facing the threats of climate change and extreme weather events. This approach aligns with and builds upon the certified premium coffee framework. It not only enhances the quality perception of coffee produced by smallholders but also incorporates an insurance premium designed to protect these farmers from the increasing risks associated with climate change.

Under this approach, the costs associated with climate insurance—such as the insurance premium and implementation expenses (including administration, operations, payout distribution, and margins)—are passed on to consumers who purchase coffee sourced from climate-insured farms, similar to certified or specialty coffee programs.

Effective climate risk management is crucial for maintaining the stability of farmers' incomes and securing their livelihoods. A key strategy for empowering farmers is protecting their farms from climate-related disasters. When farmers have the necessary support and resources to safeguard their crops from adverse weather conditions—such as droughts or heavy storms—they can confidently reinvest in their coffee farms. This not only strengthens the farmers' resilience but also enhances the resilience of the entire supply chain that relies on sustainable coffee production. Ultimately, this contributes to the long-term sustainability of the coffee industry.

Industry Motivation and Drives

The motivations and drivers for various industry actors regarding the coffee climate protection certificate approach is illustrated in Figure 1. The key drivers to adopt the coffee climate protection certificate is that farmers get financial protection, traders get sufficient coffee volumes and quality

from loyal farmers to process and market to the roasters, in-turn roasters get a consistent and reliable supply of good quality coffee to their consumers.

The coffee supply chain is a complex and interconnected network that involves various stakeholders, including farmers, traders, roasters, and retailers. Among these participants, farmers are arguably the most critical.

Climate change poses significant challenges not only for smallholder coffee growers but also for the entire coffee supply chain. A climatic event can disrupt growing conditions, leading to inconsistent coffee supplies and, consequently, volatility in market prices. The effects of these weather events extend beyond individual farms, impacting processing times, the quality of coffee beans, and overall market stability. A decline in coffee production can trigger price spikes that affect both consumers and producers.

Moreover, the consequences of climate-related disruptions can have long-lasting effects, making it difficult for businesses to recover and creating economic insecurity for farmers. These farmers may struggle to invest in necessary resources or adapt to changing conditions. Therefore, it is vital to develop new financial mechanisms that allow coffee farmers to recover swiftly after climatic events, ensuring smooth supply chain operations.

The Coffee Climate Protection Certificate is designed to provide financial support to stakeholders during adverse weather events. This initiative aims to mitigate weather-related risks through financial instruments, such as crop insurance, which can help protect the livelihoods of smallholder farmers and stabilize supply chains. By encouraging investment in climate-resilient practices and providing financial support during crises, this certificate could play a crucial role in fostering resilience within the coffee industry and ensuring its sustainability in the face of climate change.

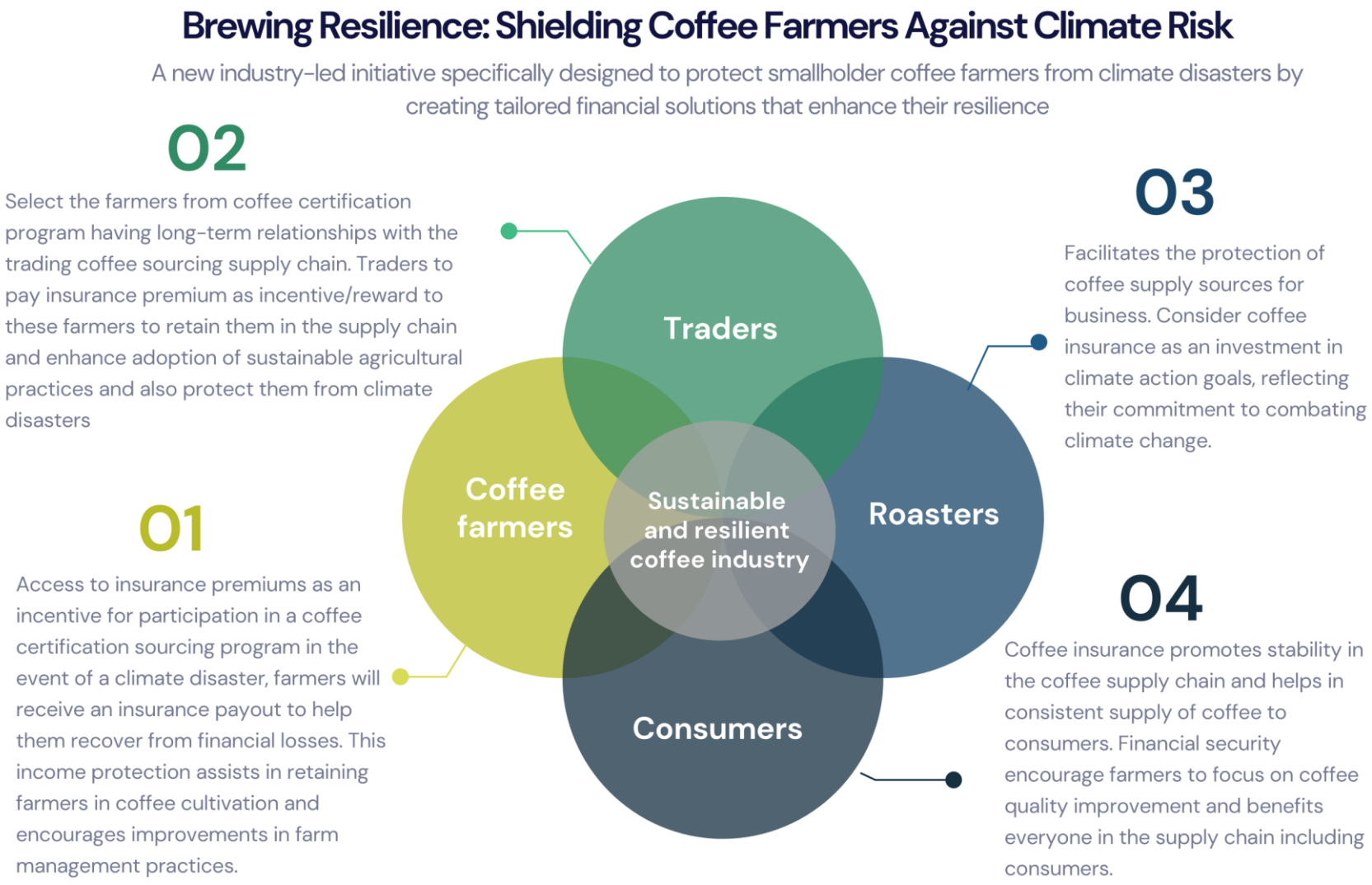

Figure 1: Motivations and drivers for various industry actors regarding the coffee climate protection certificate approach.

Operational Mechanism of Coffee Climate Protection Certificate Program

The Coffee Climate Protection Certificate program is designed to provide financial support for farmers, ensuring they can remain productive after disasters. This support also ensures that traders receive adequate volumes and quality of coffee to process and sell to roasters. As a result, roasters are able to maintain a consistent supply of high-quality coffee for their customers. The operational mechanism of the Coffee Climate Protection Certificate program is illustrated in Figure 2.

The operational mechanism of the coffee climate protection certificate program is based on the key stakeholders in the supply chain – from bush to cup – that are farmers, traders, and roasters. Farmers cultivate and sell coffee to traders, who then process the raw coffee before supplying it to roasters. Finally, roasters manufacture the finished coffee products for consumers. Importantly, the program will require full product traceability to connect the coffee with the premium and the payout.

Based on the mechanism:

- Farmers register for coffee climate insurance with coffee traders (see side of Figure 2). They sell climate-insured coffee to the traders, who, in turn, sell the coffee to the roasters. If a payout is triggered due to an extreme climate event, farmers receive the insurance payout from the trader.
- Farmers must remain dedication to the program to ensure not only financial protection against unforeseen events but also a sustainable supply of certified coffee. To achieve this, it is proposed that the premiums from coffee sales in year T fund the insurance premiums for voluntary farmers in year T+1.
- Traders buy an insurance policy for registered farmers from the insurance company. Traders enter into an agreement with roasters to sell climate-insured coffee at a premium price above the market rate - similar to the sustainable coffee program. If payout triggers, traders distribute the sum insured to coffee farmers (also see example in Table 1 and Table 2).
- Roasters buy agreed climate-insured coffee from traders, which pay for the insurance premium, and sell to consumers willing to pay a small premium price (example in Table 1 and Table 2).
- Consumers buy climate-insured coffee products (green beans or coffee at retail shops) and are willing to pay premium prices with the intention of helping primary coffee producers after climatic disasters (left side of Figure 2).

More importantly, the industry can explore innovative trading practices and procurement policies. Implementing financial risk management can have a significant positive impact on income and livelihood security. Additionally, protecting farms from climate-related disasters is an effective way to empower farmers to reinvest in their coffee operations.

Roasters and trading companies could consider investing in insurance premium costs through corporate social responsibility (CSR) initiatives or foundations. This CSR goals aligns nicely with the goals of the Coffee Climate Protection Certificate program, which aims to promote social responsibility and sustainable business practices.

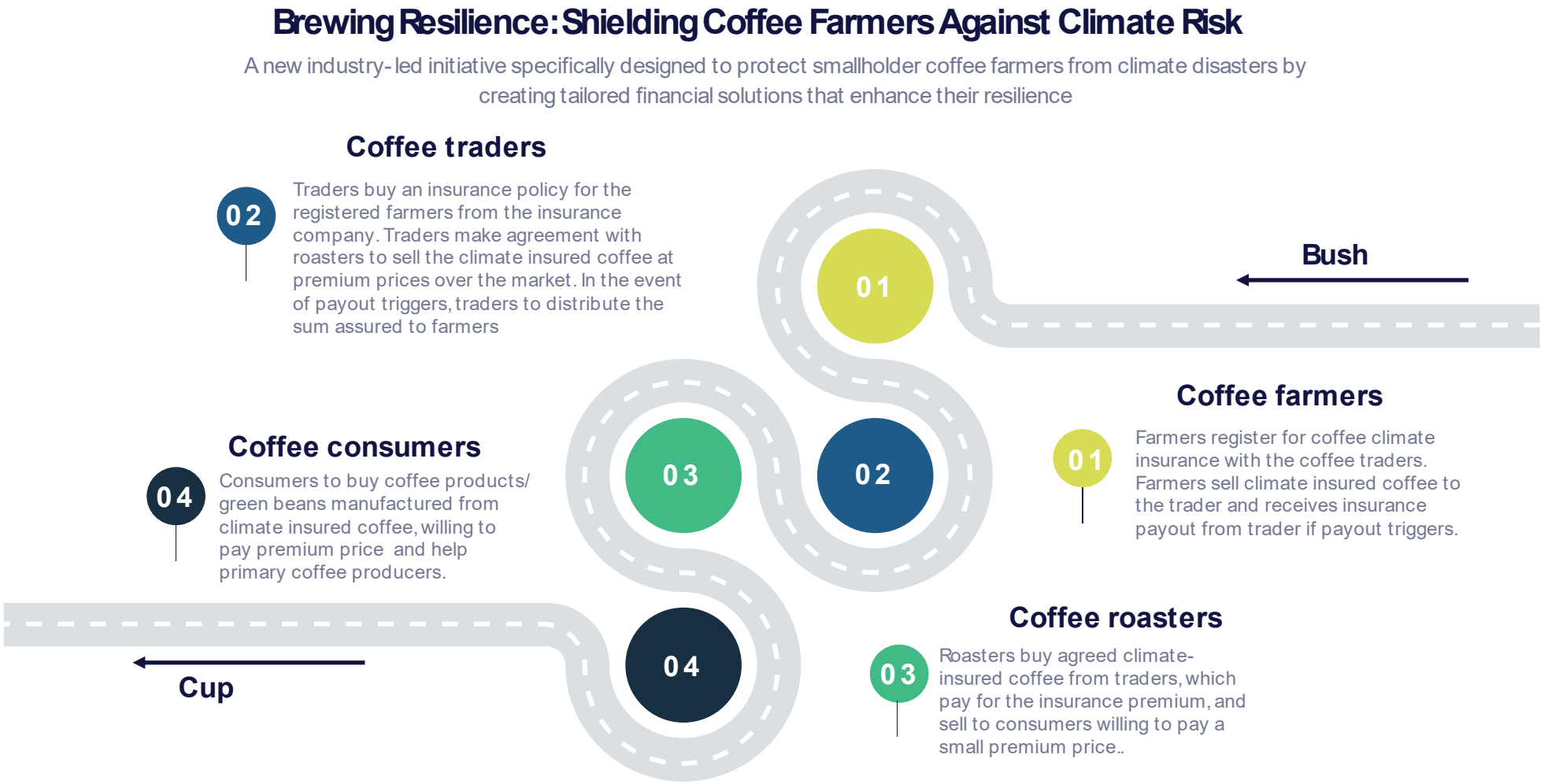

Figure 2: Flowchart describing the roles of various industry actors in coffee climate protection certificate program.

Potential Market Value of the Program.

Given the sustainable coffee purchase volumes from various initiatives and the collective reporting by the Global Coffee Platform (GCP), there is significant potential to implement a coffee climate protection certificate program. This could help achieve financial stability within the coffee supply chain.

The GCP is formed by major roasting companies, and its members aim to increase sustainable coffee purchases through collective efforts that support farmers' prosperity while moving the sector toward more sustainable sourcing practices. In 2023, sustainable coffee purchases reached 1.39 million metric tons (MT), which represents 74% of their total purchases (Figure 3).

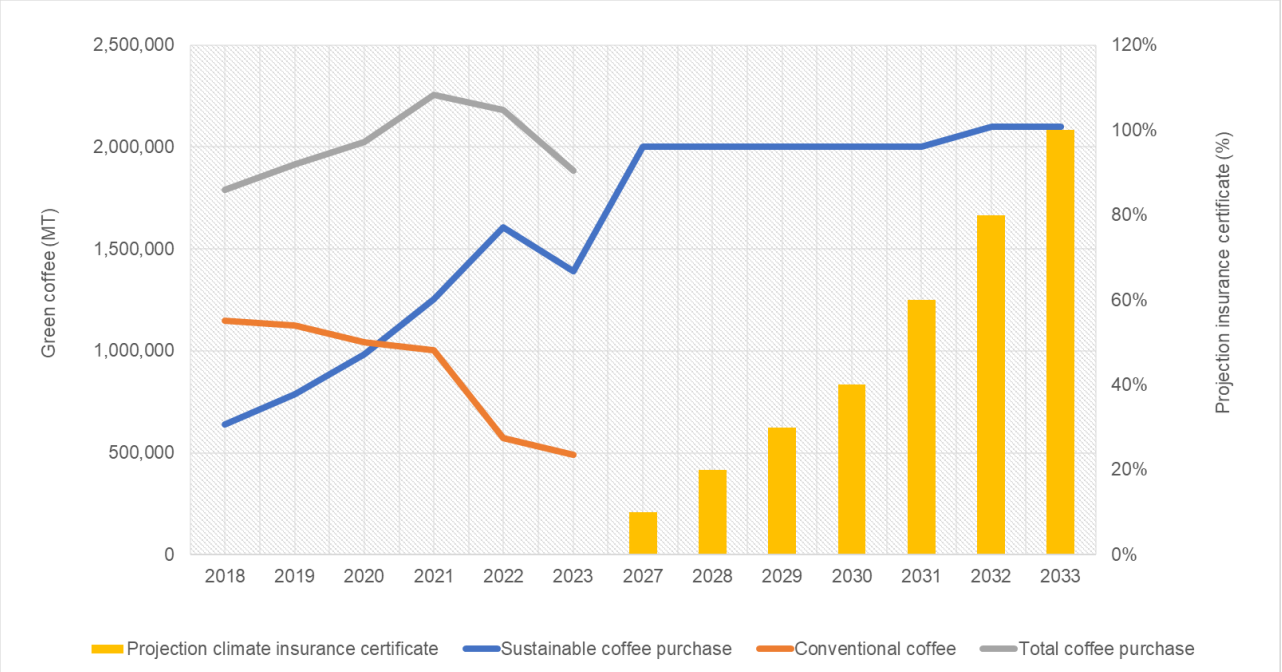

Figure 3: Sustainable coffee purchases by nine GCP members (Source: GCP Sustainable coffee purchase report 2023) and projection of coffee climate protection certificate adoption to sustainably sourced coffee (Source: Authors).

The GCP Report 2023 outlines the collective industry goal of achieving 100% sustainable sourcing of coffee among GCP members. The organisation’s mission is to promote the prosperity of coffee farmers, enhance social well-being, and support the conservation of nature.

In line with this trend, it is reasonable to expect that the adoption of the coffee climate protection certificate program will also follow an incremental trend. It is projected that during the first four years, the industry can aim to cover insurance certificates for approximately 10% (200,000 Metric ton (MT)) of farmers engaged in sustainable coffee sourcing, increasing incrementally each year. In the following years, from years 5 to 7, the coverage is anticipated to grow by 20% each year (Figure 3).

Cost and premium structure of coffee climate protection certificate program: Example of robusta and rrabica coffee in Vietnam

Case study example 1

Coffee growers encounter several climate-related challenges that significantly affect their yields, income, and livelihoods. One of the most urgent issues is extreme rainfall, which can delay harvesting and the drying process. This ultimately leads to lower yields and decreased bean quality. Unfortunately, growers often lack effective risk management strategies to address the risks associated with extreme rainfall, leaving them vulnerable to unpredictable weather patterns. Crop insurance can help growers with timely financial support when they need it most.

In this example, we will illustrate how coffee insurance certificates, particularly their cost structure, can help growers protect themselves from climate-related disasters, such as extreme rainfall. For simplicity, let's assume that the insurance coverage for extreme rainfall costs approximately USD 50 per policy, with a payout of USD 600 per policy. Additionally, we will consider a small group of 2,000 farmers eligible for this coverage. Furthermore, we will assume an average yield of 4 MT per hectare (Robusta) and 2 MT per hectare (Arabica) and estimate the premium per tonne for clarity.

Following framework presented in Figure 2, we made the following assumptions

- Similar to the sustainable coffee program, the climate insurance certificate will lead to price differentials, meaning a premium on coffee prices compared to the market rate that covers the cost of insurance.
- Farmers will register for coffee climate insurance with traders and sell climate-insured coffee to them. This enables traders to guarantee a sustainable coffee supply for effective planning.
- The coffee trader implements this insurance certificate program. Traders will include climate insurance differentials per metric ton of coffee sourced from the insurance program when selling to roasters.
- Roasters will then include the additional cost of these climate insurance differentials in their coffee products, targeting end consumers who are willing to pay for this added value.
- In the event of a payout trigger due to an extremely wet season, the trader distributes the full amount of the insured sum to all coffee farmers, the policy holders.

Table 1 provides the premium/cost to provide protection to coffee farmers from the extreme wet season. Based on the suggested premium and cost structure, a price differential of USD 13.2 per MT robusta and USD 26.25 per MT arabica coffee would be sufficient to cover the insurance premium. Based on the sustainable coffee program, which attracts an average USD 80 price differential per MT, a price differential of USD 13.2 per MT robusta and USD 26.25 per MT arabica or even higher is easily achievable.

Table 1: Cost and premium structure of insurance program for a small group of robusta and arabica coffee farmers in Vietnam

Particulars	Units	Rates	For a group of 2000 farmers Robusta	For a group of 2000 farmers **Arabica**
Number of insurance policies	No's		2,000	2,000
Administrative costs (implementing trader)	USD/policy	0.25	500	500
Operational cost (farmer registrations, sales, etc)	USD/policy	0.5	1,000	1,000
Insurance premium cost including re/insurance service cost (premium paid by trader)	USD/policy	50	100,000	100,000
Pay-out distribution cost during trigger years	USD/policy	0.50	1,000	1,000
Implementing margin for trader	USD/policy	0.25	500	500
Total cost of insurance policies	USD		105,000	105,000
Cost of insurance policy	USD/ Ha		52.50	52.50
Coffee yield	MT/Ha		4.0	2.0
Cost of insurance policy	USD/MT		13.2	26.25
Considering insurance cost as climate insurance coffee price premium over market price	USD/MT		13.2	26.25

Case study example 2

Using the same example as before, we can calculate the premium size for a trader who annually deals with approximately 16,000 MT of robusta and 8,000 MT of arabica green coffee with a roaster. We will again assume that both the roaster and the trader have agreed to incorporate the coffee climate protection certificate into their supply chain.

In the previous example, the cost of the coffee climate protection certificate is approximately $13.20 per MT robusta and $26.25 per MT arabica. We now estimate the total cost of coffee climate protection certificate coverage for the 16,000 MT robusta and 8,000 MT arabica coffee being traded (Table 2). Based on the estimate, using the premium and cost structure provided in Table 1, the total cost of trading 16,000 MT robusta and 8,000 MT arabica coffee or supporting small group of 2,000 farmers will be USD 210,000 for robusta and USD 210,000 for arabica coffee respectively.

Table 2: Cost and premium structure of coffee climate protection certificate program supporting a small group of robust and arabica coffee farmers in Vietnam.

Cost structure for large-scale insurance program	Robusta	Arabica
Cost of coffee climate insurance policy (USD/MT)	13.2	26.25
A traders coffee business with roaster (MT)	16,000	8,000
Total cost of coffee climate insurance (USD)	210,000	210,000
Average green coffee yield (MT/Ha)	4.0	2.0
Coffee area covered to source (Ha)	4,000	4,000
Average coffee farm area holding (Ha)	2.0	2.0
Number of farmers covered to source	2,000	2,000

Case study example 3

In this example, we calculate the extra cost to coffee consumers to support coffee farmers affected by climate disasters through the purchase of coffee climate protection certificates. Following the examples above, we assume that 1 kg of roasted coffee is equivalent to 1.19 kg of green beans, and the cost of a coffee climate protection certificate is $13.20 per MT robusta and $26.25 per MT arabica green beans. Table 3 provides result of supporting the extra cost or impact to consumer to support climate protection certificate.

To support the climate protection certificate program, consumers will need to pay an additional 1 cent or less per cup, which should be acceptable to consumers.

Table 3: Extra cost to coffee consumers to support robusta and arabica coffee farmers affected by climate disasters in Vietnam

Cost impact to consumers from insurance program	**Robusta**	**Arabica**
Additional cost of coffee climate protection certificate for green beans (USD/MT)	13.2	26.25
Roasted bean equivalent of 1 MT green beans (MT)	0.81	0.81
Assumption that 1kg roast beans can make about 100 cups of coffee (cups/ 1MT green bean)	81,000	81,000
Additional cost on each cup due to coffee climate protection certificate green beans (cents/cup)	< 1	< 1

Summary

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A few pilot insurance schemes have recently been proposed. This indicates that the coffee industry is becoming increasingly aware of climate risks and recognizing the importance of crop insurance. As a corollary to this, it would be more beneficial to explore the potential for a consumer payment approach. This could help consolidate our efforts into a larger industry initiative, such as the suggested coffee climate protection certificate.

By encouraging investment in climate-resilient practices and providing financial support after an extreme climate event, this certificate could play a crucial role in fostering resilience within the coffee industry and ensuring its sustainability in the face of climate change. It is also vital to promote knowledge sharing and capacity building among stakeholders regarding insurance mechanisms to maximise benefits for the industry both in the short and long term.