# Strengthening Climate Risk Management in Fair Trade value chains

Action areas and potential approaches for Fair Trade actors and German development cooperation

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| | |
|---|---|
| ACCRA | Adaptation to climate change in the agricultural sector of southern Africa |
| AGRICA | Climate risk analyses for identifying and weighing adaptation planning in sub-Saharan Africa |
| ATPI | Alter Trade Philippines Inc. |
| BMZ | Federal Ministry for Economic Cooperation and Development (Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung) |
| CDRFI | Climate and Disaster Risk Finance and Insurance |
| CRA | Climate Risk Assessment |
| CRAMSE | Climate Risk Assessment Method Search Engine |
| CRM | Climate Risk Management |
| CRP | Climate Risk Profiles |
| CSA | Climate smart agriculture |
| DC | (German) Development Cooperation |
| DRM | Disaster Risk Management |
| EDUCE | EDUCE Sociedad Cooperativa de R. L. |
| FFH | Forum Fairer Handel e.V. (Fair Trade Forum) |
| FT | Fairtrade |
| GCF | Green Climate Fund |
| GEPA | Society for the Promotion of Partnership with the Third World, Ltd. (Gesellschaft zur Förderung der Partnerschaft mit der Dritten Welt mbH), now: GEPA – The Fair Trade Company |
| GHG | Greenhouse Gas |
| GIC | Green Innovation Centers |
| GIDRM | Global Initiative on Disaster Risk Management |
| GIIF | Global Index Insurance Facility |
| GIZ | German Corporation for International Cooperation GmbH |
| ICI | International Climate Initiative |
| INA | Sustainable Agriculture Supply Chain Initiative |
| KCU | Kagera Cooperative Union |
| KfW | Kreditanstalt für Wiederaufbau |
| MAP | Multi-actor partnership |
| OFC | Organic Flavour Company |
| PIK | Potsdam Institute for Climate Impact Research |
| PrAda | Adapting agriculture to climate change project |
| SMEs | Small and medium-sized enterprises |
| SV NAREN | Sector Project Sustainable Agriculture |
| TPI | Tea Promoters India |
| WASCA | Water Security and Climate Adaptation in Rural India |
| WE4F | Water and Energy for Food |
| WFTO | World Fair Trade Organisation |

## Executive Summary

Adverse weather and climate variability are impacting the agriculture production in all regions of the world. The effects are felt especially hard by small-scale agricultural producers. Currently around 2.9 million small-scale producers and workers in over 75 countries participate in Fair Trade schemes. This study analyses climate risks based on typical value chains by GEPA – The Fair Trade Company, focusing on the agricultural sector.

The aim of the study is to contribute to the development of ideas on how the risk management and resilience of Fair Trade value chains and their actors can be improved against the negative effects of climate change and weather extremes. Specifically, the study identifies climate risks for Fair Trade value chain actors, adaptation measures already being implemented, and additional support needs (see chapter 3). Based on these climate risks and support needs, the study outlines main action areas, potential support approaches, and lists examples of existing policies, instruments, and initiatives supported through German development cooperation (see chapter 4). Finally, the study presents ideas on how the resilience of Fair Trade value chains could be strengthened (see chapter 5).

The study's results show that all producer organisations and producers that participated in the survey report experiencing extreme weather events and/or changes in weather patterns during the last ten years. Production is the part of the value chain perceived as being most affected by extreme weather events or changing weather patterns. 97 % of survey participants stated that their production costs have increased. The availability of water and the health of employees are the processing factors most sensitive to climate related impacts. Transport infrastructure, including roads, bridges and sea harbours, are also cited as being at risk of weather-related events.

Awareness about the need to adapt to climate risks is very high in producer countries, with adaptation measures most often being practiced in the areas of crop, soil and water management. Most adaptation measures are not embedded in a broader or systematic risk management approach. Around 75 % of the survey participants state that there is no risk management at the cooperative level. While income diversification is widely applied as a financial risk management approach, only around 10 % of fair-trade producers or producer organisations use insurance as an adaptation measure. Overall, awareness about financial risk management and risk transfer options seems to be low among the interviewed fair-trade actors. Weather information is used only by about one-third of the producers.

Financing and training for the implementation of (climate) risk management measures are the top-priority support needs by survey participants. For two-thirds (66 %) of participants, financial support for the implementation of risk management measures is key. One-third (34 %) would welcome trainings on climate risk management and adaptation to climate change and one-quarter (25 %) would like support for awareness raising about the impacts of climate change among producers.

Furthermore, survey participants list factors related to the Fair Trade model, which can decrease vulnerability to climate risks. These factors include stable and fair prices, Fairtrade premiums, environmentally sustainable farming practices, direct financial support and long-term relationships between importers and producers. Factors that may increase vulnerability are also highlighted and include the high Fairtrade production standards, which may be impossible to meet when adverse conditions affect crop quality.

Production losses and higher production costs usually lead to secondary effects along the value chains, including for Fair Trade actors in the importing countries. Impacts include reduced quality, quantity and increased heterogeneity of agricultural products, insufficient or delayed products that violate the terms of purchase agreements, unfulfilled orders leading to loss of income, loss of market share and shelf space for the importers, contractual penalties imposed by retailers and loss of customers stemming from the loss of shelf space.

While the Fair Trade importers interviewed for this study rarely address climate change adaptation systematically, the analysis reveals that importers already employ several measures intended to reduce climate risks, which particularly support producers. Measures include the provision of grants to producer organisations to protect production and/or processing against impacts of weather and climate extremes, pre-financing for a product to facilitate liquidity for producers, offsetting production losses with price mark-ups, changing processing and blending practices to substitute lower quality or delayed lots, contracting higher volumes of produce from several partners to absorb production fluctuations or diversifying trading partners and countries. While most of the adaptation measures reduce the vulnerability of producers, they can increase the vulnerability of the trade organisations, e.g. if price mark-ups cannot be passed on to end customers.

Based on the analysis of the main risks and support needs, five general action areas were identified as particularly relevant for reducing climate risks for Fair Trade actors in producing, as well as in importing countries (see chapter 4). Many of these areas overlap since the underlying risks either affect or can be addressed by both actors. While this implies that climate resilience of Fair Trade value chains is to a certain extent a shared responsibility, the priorities and action areas differ between these actors. Certain adaptation needs, like adapting public infrastructure to the effects of climate change, would require additional support by the public sector and others. Overall, adaptation action is still insufficient. To strengthen climate risk management in Fair Trade value chains, Fair Trade actors and German development cooperation should consider further action on the following key recommendations:

1. Provide training and learning opportunities on climate risks and adaptation options by expanding the offering of existing initiatives and platforms for Fair Trade actors.
2. Strengthen the implementation of climate risk management for Fair Trade producers. Priority should be given to applying climate risk management approaches at cooperative and farm-level, enhancing access to producer-oriented climate change information and climate services, conducting climate risk assessments at farm-level, promoting climate-resilient agricultural production at the farm-level (with a strong focus on water management), and reducing climate risks in processing.
3. Improve access to finance for climate risk management activities and to financial risk management approaches, including insurance, for Fair Trade actors in producing and importing countries, particularly for small producer organisations.
4. Explore options to strengthen the efforts of Fair Trade importers to provide support and/or to finance to producers. This could include facilitating and improving access to financial support for producers or cooperatives to avoid or address impacts on the quantity or quality of a product.
5. Strengthen the provision and access to climate risk information for Fair Trade value chains and actors. Beyond the classic climate service approaches for farmers, enhanced access to information should include the development of climate risk assessments and profiles for whole value chains, trade portfolios or selected commodities.
6. Develop new risk sharing and management options for, and together with, actors along Fair Trade value chains. These options should adequately reflect the costs of adapting to the impacts of climate change in product prices. Another risk sharing and management approach for Fair Trade actors could be, for example, to integrate adaptation into Fair Trade standards.

# 1. Introduction

Around 2.9 million small-scale producers and workers in over 75 countries benefit from Fair Trade trade.[1] Experience has shown that weather extremes and climatic changes pose high risks to Fair Trade value chains, with weather, climate and water hazards accounting for more than 70 percent of global economic losses between 1970–2019.[2]

Adverse weather and climate variability affect the production particularly of small-scale agricultural producers, which, in turn, impact the entire value chain. As this study illustrates, specific components of the value chain, including processing, storage, and public infrastructure, may be directly impacted. Various actors along the Fair Trade value chain are responsible for reducing climate risk impacts, making risk reduction a shared responsibility if the benefits for all Fair Trade value chain actors are to be secured.

The notion of promoting shared responsibility for risk reduction is entrenched in the Fair Trade business model. Fair Trade has systematically integrated social and environmental standards into its business practices to promote sustainable development. Social and environmental resilience are also seen by Fair Trade actors as a key pillar for adapting to climate change.

However, the frequency and intensity of climate-related, extreme events, along with climate variability, has put Fair Trade actors under pressure. It is, therefore, urgent to improve climate risk management in Fair Trade value chains to secure past development success and future livelihoods.

This study aims to contribute to the development of ideas on how the risk management and resilience of Fair Trade value chains and their actors can be improved against the negative effects of climate change and weather extremes. Specifically, the goals of the study are to:

1. Identify risks for typical Fair Trade value chain actors that arise due to weather extremes and climate variability, as well as to identify adaptation measures that are already being implemented and the support that is needed (see chapter 3);
2. Identify the main action areas and potential support approaches, as well as examples of existing policies, instruments and initiatives from (German) development cooperation (DC) and Fair Trade practices (see chapter
3. Summarize recommendations and ideas on how Fair Trade actors and German development cooperation can strengthen the resilience of Fair Trade value chains against the impacts of weather-related extremes and climate change (see chapter 5).

The analysis has been conducted based on information gathered through an online survey and through expert interviews, and includes a detailed analysis of three typical value chains from GEPA – The Fair Trade Company in the areas of tea, coffee and honey. Chapter 2 describes in more depth the approach of the study.

1 Forum Fairer Handel e.V. (2021): Aktuelle Entwicklungen im Fairen Handel.
2 WMO (2021): Weather-related disasters increase over past 50 years, causing more damage but fewer deaths.

# 2. Goals and approach of the analysis

## 2.1 Goals of the analysis

In order to identify potential starting points for improving *risk management* along Fair Trade value chains, a first step of the study was to highlight some of the major weather and climate change impact-related risks (in short: *climate risks*) and challenges, as perceived by central actors along selected Fair Trade value chains. Climate risks result from a dynamic interaction of weather- and climate-related *hazards* (e.g. floods, storms, droughts) with the *exposure* and *vulnerability* of a value-chain to these hazards. The exposure of a value chain or elements of it (e.g. the distance of a factory to a river determines its exposure to flooding) and its vulnerability (e.g. the factory's susceptibility to harm, lack of capacity to cope and adapt of farmers and workers) can potentially be reduced by value chain actors through the implementation of adaptation measures. The analysis, therefore, also looked at the adaptation measures taken so far by value chain actors in response to certain risks, as well as their needs for further support.

Effective risk management requires putting in place plans, actions or policies that reduce the likelihood and/or the consequences of these risks. In addition to the identification of climate risks, adaptation measures already practiced by individual value chain actors and their support needs, the analysis, in a second step, identified main action areas as well as potential core activities (support approaches) which are relevant for reducing climate risks in producing and importing countries. Finally, the analysis looked into examples of existing policies or support mechanisms Fair Trade by German Development Cooperation which address the suggested main action areas and core activities. Finally, the study presents recommendations and ideas on how the resilience of Fair Trade value chains could be strengthened The aim is to spur a discussion about potential ways to improve risk management in Fair Trade value chains.

The following two sections provide further information about typical agricultural Fair Trade value chains considered in this analysis, including their characteristics and key actors (section 2.2). The final section of this chapter briefly explains the methodological approach of the analysis (section 2.3).

## 2.2 Analysing typical agricultural Fair Trade value chains

The analysis of climate risks for Fair Trade actors was based on the analysis of typical Fair Trade value chains of GEPA – the Fair Trade Company in 2019 focussing on the agricultural sector.[3] Figure 1 depicts the typical steps along a GEPA agricultural value chain, starting at the production site and finishing with the end user. The steps include:

1. Production
2. Storage
3. Processing
4. Packaging
5. Transport (incl. export/import harbour)
6. Processing and packaging
7. Trading
8. Distribution and
9. Retailing

GEPA products, including raw materials (like coffee and cocoa) and products that have been processed in the countries of origin and are ready-to-sell (such as tea or honey, are usually shipped to Germany, typically to Hamburg or Bremen. GEPA also imports bulk honey and tea, which are packaged in Germany. In the case of raw materials, service providers in Germany usually take over the final processing and packaging. In the case of ready-to sell products, these are typically delivered from the harbour to the GEPA head-office[4] in Wuppertal. Some products remain at GEPA's headquarters for sale, some are transported to regional Fair Trade Centres[5] or directly to retailers (e.g. World Shops, bio and health-food shops or conventional retailers). Transportation throughout Germany usually takes place by truck.

3 The term "fair-trade actors" refers to the relevant actors along the value chain: producers, civil society, importers, service providers and retailers. The actors/groups referred to in the study are listed in Annex 2.

4 The same location includes GEPA head office, storage facilities for products and a sales center; products arrive at the storage facilities.

5 The purpose of the regional fair-trade centers is to represent GEPA in different parts of Germany and to offer clients (retailers) the chance of viewing the products before purchase, which was indicated as especially relevant in the case of handicrafts.

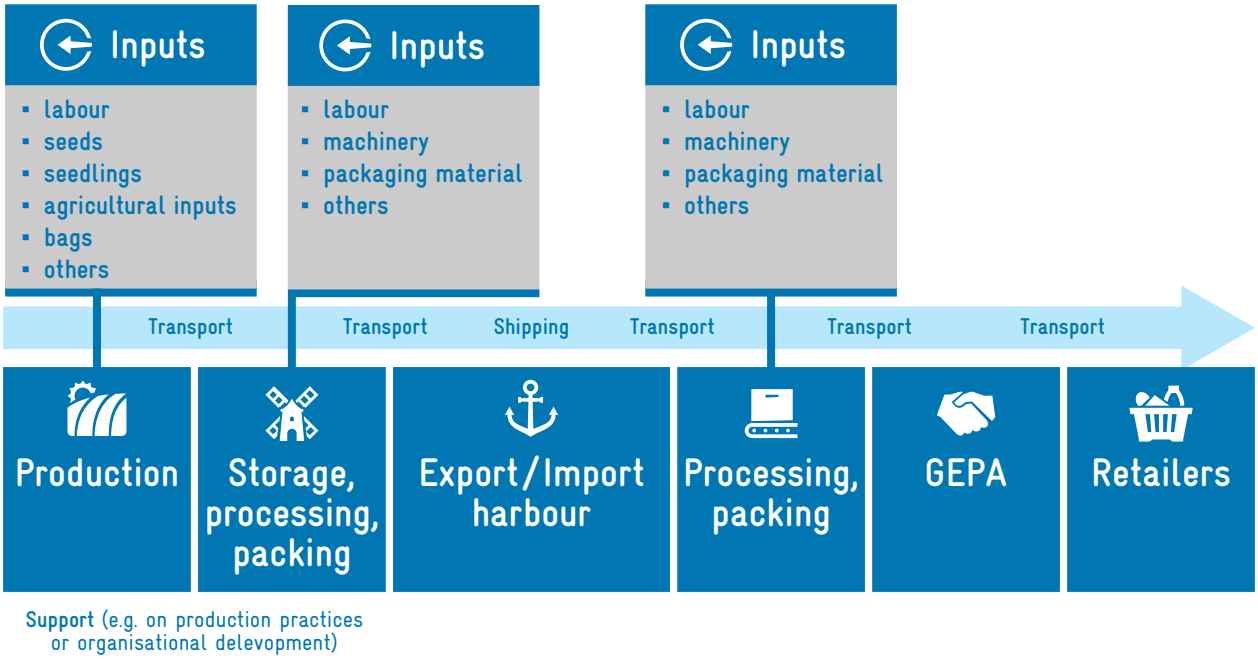


Figure 1: Typical GEPA Fair Trade value chain

The value chains may also receive additional inputs or supporting services from private, civil society or governmental actors. Value chains, therefore, provide income and employment for a broad range of actors, such as service providers, including extension service providers, producers of seeds and agricultural inputs, producer organisations, civil society actors, trade agents, and many others. The interaction among actors along a value chain depend on the local, national, and sector-specific context.

Key characteristics of Fair Trade value chains are full transparency and traceability back to the point of sale. In most of the cases, Fair Trade partners try to keep value chains short. Usually, GEPA directly sources the raw materials or processed and packed products from the producer organisations without involving intermediaries, thereby following one of the key principles of Fair Trade. Knowledge about a product's origin and who handles it at each point along the value chain ensures transparency and helps the Fair Trade importers to ensure that all producers are treated according to their Fair Trade principles and standards. Additional features of Fair Trade value chains are that they predominantly target small-scale producers or associations and include products that travel long distances between production, processing and export. Production sites often are located in remote, difficult to access areas.

While Fair Trade agricultural value chains follow common steps and share many of the same characteristics, they also differ in various aspects, for example, with respect to:

1. Production needs: the production needs of crops usually differ based on the crop type. For example, honey, tea and coffee require differing infrastructure and machinery. Soil and climatic conditions also factor into production needs. The crop type is one exemplary factor that determines differences in production needs.
2. Organisational structures and governance: the organisation and governance of production processes and producer organisations may differ. Small-scale producers and associations are predominate in GEPA value chains; however, companies with employees also participate in Fair Trade value chains.
3. Transport distances: the geographical location and characteristics normally differ along transportation routes, as well as the distance between production plots, processing sites, storage, access to harbours and shipping.

The outlined steps and actors along Fair Trade value chains may be affected in different ways by climate risks. Accordingly, these steps and actors might require specific interventions or support.

### Fair Trade standards and principles

- German Fair Trade actors are organized in the Fair Trade Forum (Forum Fairer Handel e.V.), an association with 8 members, including **GEPA** – The Fair Trade Company, **EL PUENTE**, **WeltPartner**, **BanaFair e.V**. und **GLOBO** – Fair Trade Partner; **Naturland** – Verband für ökologischen Landbau e.V.; **Weltladen-Dachverband** e.V.; **Fair-Band** – Bundesverband für fairen Import und Vertrieb e.V).
- Fair Trade certification labels include Fair for Life, Naturland Fair, Fairtrade and SPP, all of which are acknowledged by the Fair Trade Forum
- International Fair Trade criteria are based on common standards. The World Fair Trade Organisation (WFTO) serves as a global institution /community of Fair Trade actors and verifies the Fair Trade practices of enterprises.
- The **WFTO Guarantee System** include **10 Principles of Fair Trade**: (1) Opportunities for Disadvantaged producers, (2) Transparency and Accountability, (3) Fair Trade Practices, (4) Fair Payment, (5) No Child Labour, no Forced Labour, (6) No Discrimination, Gender Equity, Freedom of Association, (7) Good Working Conditions, (8) Capacity Building, (9) Promote Fair Trade, (10) Protecting the Climate and Planet.
- The "Fairtrade Standards" include the standards of Fairtrade International. Fairtrade certification is carried out by FLOCERT.
- GEPA has developed the sign "fair+" as part of its communication strategy, describing their role as Fair Trade Pioneer in Germany. "fair+" represents activities, which go beyond product certification. It is not a label, nor a certification.
- A **fair minimum price** is intended to serve as a guarantee (e.g., in the event of a drop in prices on the stock exchange) that covers production costs and living expenses (and to enable a decent life). **Premiums** (incl. premiums for social activities of the community and of the producers) are also part of the Fairtrade pricing system to decrease vulnerability of producers.

Furthermore, value chains may suffer from direct and indirect effects. Direct (or primary) effects include, for example, the degradation of transport routes resulting from flooding, or unseasonal rains negatively impacting drying processes. Direct effects may bring about indirect (secondary, or cascading) effects. Indirect effects include, for example, reduced capabilities of importers to comply with contract conditions arising from production shortfalls, or reduced consumer demand due to higher product prices, which may be caused by various factors, such as production losses, higher transportation, or production costs.[6] Direct and indirect effects are, therefore, interlinked, as extreme weather events may lead to shortages or losses resulting in non-compliance with contract conditions.

The characteristics of agricultural Fair Trade value chains may be more or less advantageous in terms of addressing climate risk vulnerability in comparison to conventional value chains in the agricultural sector. A typical Fair Trade approach of **keeping value chains short** can, for example, reduce the value chains vulnerability, as long-lasting and close business partnerships between the producer organisations and the Fair Trade importer can lead to a strong mutual support network and trust. However, these long-term business partnerships, and given that Fair Trade relies on certified products, also implies that Fair Trade importers cannot, or would not like to, quickly switch to other global suppliers.

## 2.3 Methodological approach of analysis

The analysis has drawn on desk research, information derived from a qualitative, in-depth analysis of three typical agricultural value chains (see Annex 1), an online survey among Fair Trade actors in the global south and 36 expert interviews. (see Annex 2). It has been complemented by a mapping of existing support programmes and initiatives targeting value chain actors, with a particular focus on, but not limited to, the Fair Trade sector.

Among the 36 interviews, two were held with the Federal Ministry for Economic Development and Cooperation (BMZ), 13 interviews took place with GIZ technical experts in the field of agriculture, climate change adaptation, Fair Trade and private sector development, and 21 interviews were carried out with Fair Trade and non-Fair Trade actors, who are involved in different steps of the value chain, ranging from production to points of sale (see Annex 2).

The online survey targeted producers and producer organisations and was conducted by GIZ and GEPA staff between June and July 2019. In total, 24 producer organisations, including 9 cooperatives or cooperative unions, 5 producers and 3 additional actors belonging to the categories of traders, exporters and promotion bodies participated in the analysis.

6 One of the principles of fair trade is the fair minimum price, which is intended to serve as a guarantee for a floor price (e.g. in the event of a drop in prices on the stock exchange), and aims to cover production costs and living expenses (and to enable a decent life).

The majority of producer organisations interviewed have up to 500 and some have between 500 to 1000 farmers as members. Most survey participants produce agricultural products (for a comparison, see figure 2)[7] and are located in mountainous regions (see figure 3). Non-agricultural products include, for example, handicrafts.

The largest group of survey participants (almost 60 %) is based in Latin America, where most of the GEPA product partners are located. 25 % of responses came from Asia, 10 % from Africa, and the rest from Europe. The survey was based on a standardized questionnaire aimed at assessing climate risks. Questions covered the following topics:

1. The experienced impacts of weather extremes and changing weather patterns
2. The relevance of impacts for different parts of the value chain
3. Adaptation measures that are already being used and further support needs; and
4. The relevance of the Fair Trade model for business operations, including the vulnerability of business operations arising from the Fair Trade scheme

A qualitative assessment of three typical value chains was chosen to represent the larger product groups of GEPA, as well as three main producer continents: Latin America, Africa, Asia. The three value chains that were subject to in-depth analysed were: tea from the family-owned tea company Tea Promoters India (TPI) in India, coffee from Kagera Cooperative Union (KCU) Limited in Tanzania, (an umbrella organisation in Kenya), and honey from the export organisation EDUCE in Mexico. The respective value chains of these producers are described in more detail in Annex 1.

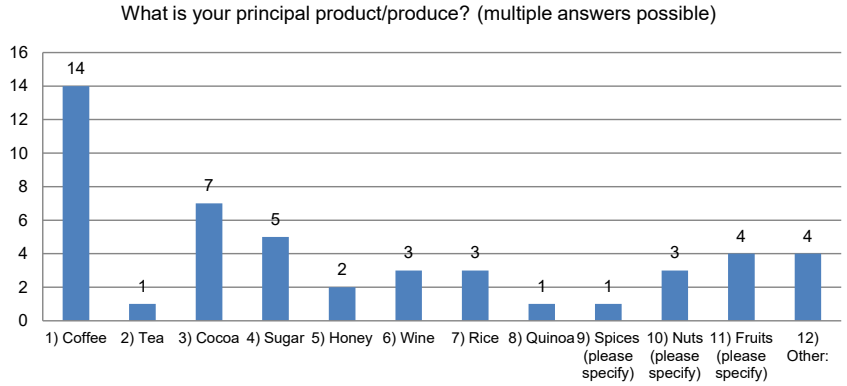


Figure 2: Principal products of survey participants.

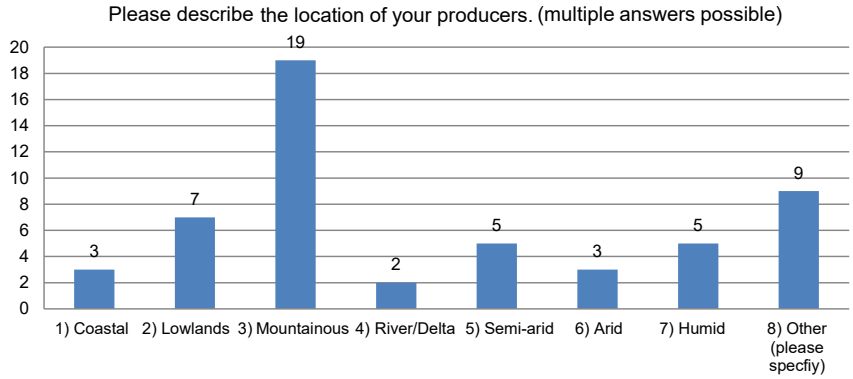


Figure 3: Location of producers.

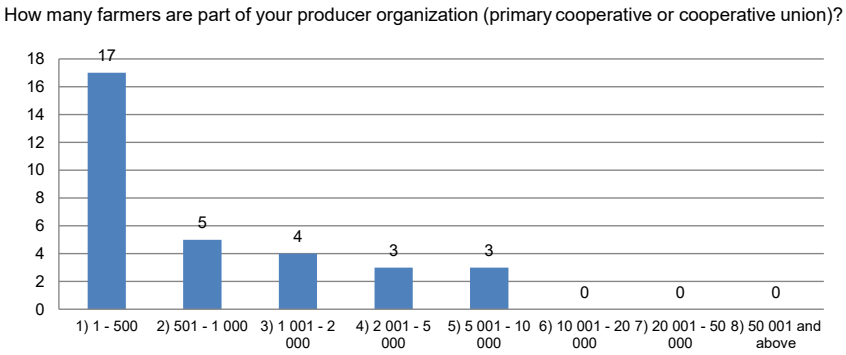


Figure 4: Quantity of farmers being part of a producer organisation (primary cooperative or cooperative union).

7 Specifications of spices, nuts and fruits were: curcuma, ginger, garlic, pimiento, ishpink, cinnamon; coconuts; citrus, dried apples, dried cherries, dried persimmon, raisins, bananas.

# 3. Climate risks, adaptation measures and support needs of value chain actors

Climate risks can arise along different steps of the Fair Trade value chain, affect various actors and can lead to direct or indirect effects. The climate risks, adaptation measures already being implemented and the additional support needs identified by the analysis are described below for producing (section 3.1) and importing countries (section 3.2).

## 3.1 Climate risks, adaptation measures and support needs in producing countries

### 3.1.1 Climate risks

GEPA trading partners in Africa, Asia and Latin America experience increased difficulties with their agricultural harvests due to adverse weather or climate-related changes. Whereas the tea producers in India and the coffee producers in Tanzania face changing precipitation patterns that have resulted in irregular rainy seasons and dry spells, the honey producers in Mexico are impacted by changes in temperature and humidity that affect flower growth and bee activity. The online survey of Fair Trade actors from around the world confirms these experiences.

**All producer organisations or producers that participated in the survey report experiencing extreme weather events and/or changes in weather patterns** during the last ten years. These changes include both extreme weather events, such as flood events, storms, cyclones and hurricanes, and drought, as well as slow onset processes such as a rise in temperatures or changes in seasonality, sea-level rise or water scarcity. In Hunza, Pakistan, changes also included a moving glacier. Rising temperatures and drought were perceived as particularly problematic, followed by changes in the rainy season and heavy rains.

**These weather events and changes also affect the value chains**. Over 90 % of all survey participants, as well as tea, coffee and honey producers, TPI, KCU and EDUCE, respectively, indicated that their value chains are being affected by these climate-related changes today and that they expect them to continue to be affected in the future. As shown in figure 5, adverse effects are expected for all steps of the value chain, first and foremost impacting production, and to a lesser extent affecting consumer behaviour and demand, transport, and processing**.**

**Production is the part of the value chain, which is perceived as being most affected by extreme weather events or changing weather patterns** (see figure 5). This perception can be linked to the fact that the business model of most respondents is based on agricultural products (for comparison, see figure 2). 94 % of the survey participants indicated that they have experienced production losses due to changing weather patterns or extreme weather events in the last five years. For almost 90 % of the producers, the production losses range between 10 % to 50 %, two participants even indicated 60 % or 70 %, respectively. Tea producer TPI in India reported experiencing production losses of around 20 % over the past five years across all production regions.

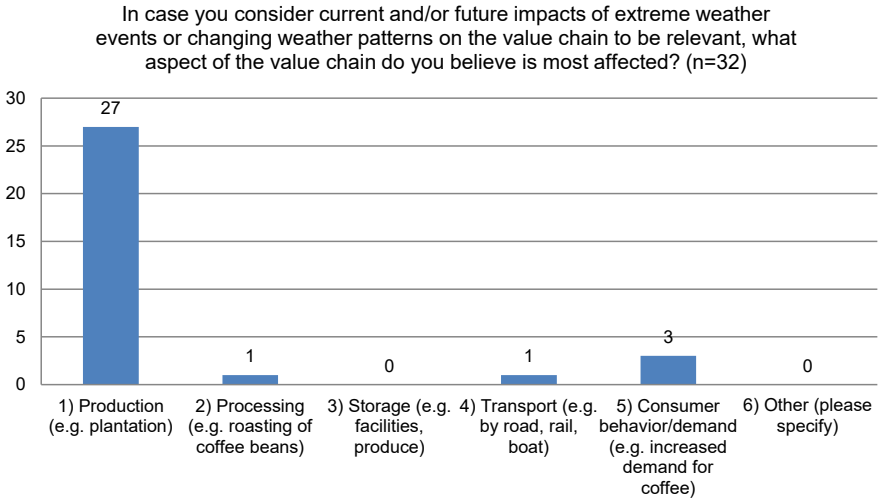


Figure 5: Most affected aspects of value chain by climate-related changes.

**Changing weather patterns or extremes have also affected production costs.** 97 % of survey participants state that their production costs have increased in relation to changing weather patterns or extreme weather events in the last five years, in several cases more than 50 % and in one case even more than 70 % (see figure 6). Increasing production costs were also confirmed by the three interviewed GEPA partner organisations TPI, KCU and EDUCE. According to KCU, production costs increased as the need for chemical applications increased due to incidents of pests and diseases (e.g., stem borers, black ants, leaf rust, Coffee Berry Disease).

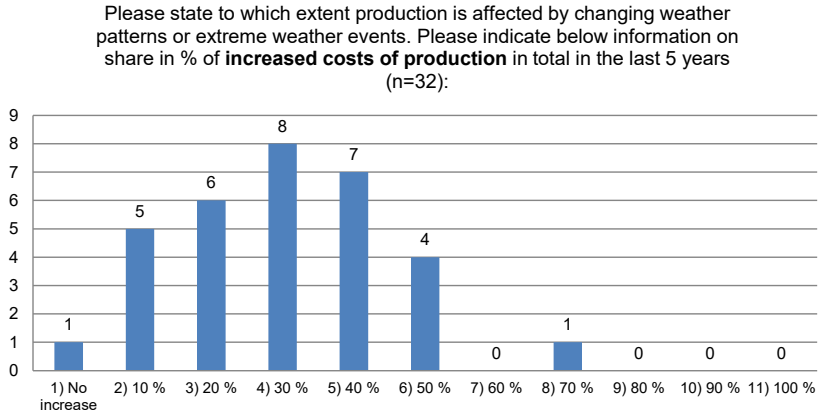


Figure 6: Increased production cost by extreme weather events from 2014–2019.

Approximately two-thirds of the reported production losses and four-fifths of the reported increased production costs were attributable to multiple weather-related events, rather than a single event.

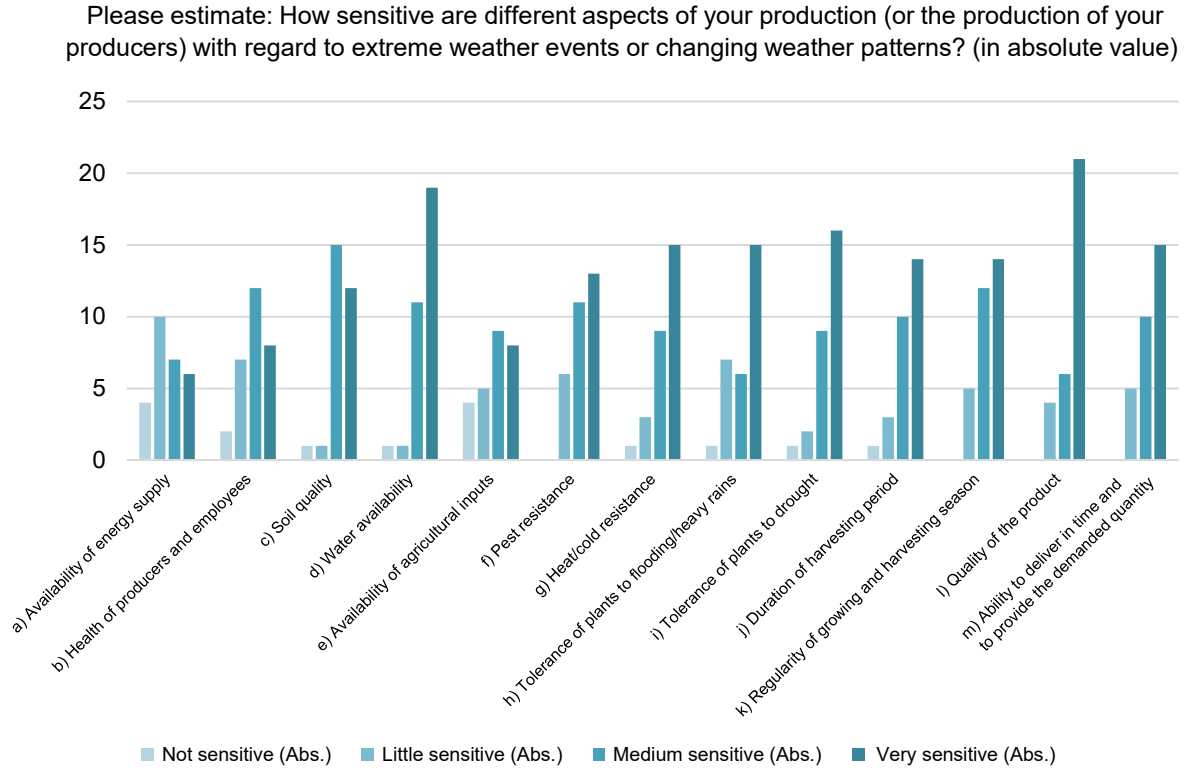


Figure 7: Sensitivity of production aspects to extreme weather events.

**Survey participants report that several climate-relevant factors affect their production simultaneously** (see figure 7). A majority of respondents report that water availability and product quality are particularly susceptible to extreme weather events or changing weather patterns. Other susceptible production aspects include the duration of the harvesting period, heat or cold resistance of the produce, tolerance of plants to flooding, heavy rains and droughts, and the ability to deliver on time. Many also rank pest resistance, the regularity of growing and harvesting season and soil quality as very important climate sensitive factors. When comparing the different production factors that are perceived to be very sensitive to weather events or changing patterns, the availability of energy supply, the health of producers and employees, as well as the availability of agricultural inputs were prioritized less often.

## How climate risks affect coffee, tea and honey production

The tea, coffee and honey value chains of Tea Promoters India (TPI), Kagera Cooperative Union (KCU) and EDUCE illustrate how their climate risks differ.

**Tea producer TPI in India**

- is mainly affected by stronger monsoon rains, as well as changes in precipitation patterns, resulting in excessive heavy rains outside monsoon season. The direct impacts are **soil erosion and landslides** on the slopes where the tea is traditionally grown on. This affects both the tea production itself as well as the supporting infrastructure.
- TPI estimates that it has lost around 20 % of its production over the past five years across all the production regions. In 2018, parts of a tea plantation in Kerala region were flooded, leading to the loss of tea plants, as well as the processing unit. Besides these changes in precipitation, the longer and drier winters also pose a threat to tea production in all six different regions. Tea bushes dry up, which decreases the quality and quantity of the tea production. "**Changes in weather patterns** such as irregular, delayed or sudden rainfall, hailstorms, drought, severely affect the quality of tea produced. Low quality tea leads to decreased demand for tea in the consumer market." (TPI, India).

**Coffee producer KCU in Tanzania**

- is facing similar changes within its environment and weather. With seasons becoming less distinct, the coffee crop cycle has been disrupted. A perceived **decrease in precipitation** seems to be the main contributor to production losses. When rain is needed during the flowering period of the coffee bushes, it is missing, resulting in no or less flowering. Less rain during the fruits' maturing period impedes fruit development, thereby **decreasing crop quality and quantity**. Changes in rainfall patterns also pose difficulties for coffee drying. During and after the harvest it may still rain, making it difficult to sun-dry the coffee on patios. Rains during drying may lead to decreased coffee quality and potentially quantity. Furthermore, the rains prolong the drying process, translating into delayed coffee lots for the buyer.
- Higher temperatures, as well as prolonged droughts also increase the risk of pests and diseases. To avoid an infestation with stem borers, black ants, leaf rust or even coffee berry disease, the producers increasingly need to use pesticides, which increase production costs and threaten the ability of producers to use organic labels.

**The honey production of EDUCE in Mexico**

- is impacted by small **changes in the microclimate, which** threaten both the flowers and bees. Temperatures changes, humidity and precipitation have led to **changes in the floral cycles and flower phenology**. They also have created favourable conditions for the mite *Varroa destructor,* which feeds on the bee brood and, therefore, affects the feedstock of the bees, resulting in negative effects on the health of beehives and sometimes even in the elimination of the hives.
- The honey producer, EDUCE, hardly needs any inputs for production. The indigenous Mayan producers mostly build their wooden beehives themselves and do not use any chemicals against pests or diseases.

Box 2: How climate risks affect coffee, tea and honey production

**The direct effects on production losses and higher production costs usually lead to secondary effects along the value chains**. They translate, for example, into income losses, which puts pressure on farmers and producer organisations. According to the interview partners in producer organisations, as well as Fair Trade importers, these impacts may lead to increased food insecurity, less participation by children in school, and even migration.

**Climate risks affecting production can also lead to secondary effects on demand.** With regard to product demand, positive as well as negative effects have been reported. Whereas 19 respondents state that the demand for their product has not changed due to extreme weather events or changing weather patterns, four responded that demand has increased and nine reported that it has fallen. The main reasons given for an increase in demand is lower production and, therefore, lower availability of the product on the market. A raisin producer reported that better quality led to an increase in demand.

Lower production rates and decreases in quality are seen as the main reasons for lower demand. Producers noted a decrease in demand due to product supply shortages on the market. They report that customers shift to other suppliers if supply is too low and an order cannot be fulfilled.

Tea quality is being affected by drought, along with changes in precipitation patterns, including an increased incidence of hailstorms. A general shift in potential cultivation zones, river overflow in production areas and increasing incidences of pest and disease have decreased both production rates and quality.

The direct climate-related effects on the quality of a product have also led to secondary effects, e.g. higher costs for agricultural inputs, including the use of chemical inputs. The use of chemicals to control pests and diseases can, in turn, further decrease demand. Most Fair Trade actors adhere to organic standards and do not permit the use of any chemicals.

In comparison to impacts on production, processing is seen to be less sensitive to climate risks. Among the processing factors where most producers experience sensitivity is regarding the availability of water, the health of employees (or producers) as well as energy supply. The telecommunication infrastructure, agricultural inputs and infrastructure are seen as secondary risks.

**Even though it was not ranked as a top priority among producers, the survey illustrates that road transport presents a climate risk for Fair Trade value chains**. 40 % of the online survey participants indicate that there is only one route and one transport provider available. Roads are the primary means of transport for Fair Trade actors between production and processing sites or between processing sites. In the event of road closures due to weather or climate-related events, products must be stored, with a risk of spoiling and increasing costs for storage and additional handling. Transport by air between the production and processing site was reported as only being used once.

The primary means of transportation[8] to markets and to customers in the analysed Fair Trade value chains is shipping (25), followed by roads (15), air cargo[9] (6), shipping on rivers (4) and via railway services (2). Looking at the assessments of the overall exposure of transport infrastructure, roads and bridges, but also sea harbours are seen to be most at risk by weather-related events. Only relatively few judged that riverine harbours, airports, and railroads would be affected.

8 Multiple answers possible
9 Products with a very short shelf life and samples (before the actual order is placed) are shipped by air cargo.

### 3.1.2 Adaptation measures practiced

**Awareness about the need to adapt to climate risks is very high**. TPI India, KCU in Kenya, EDUCE in Mexico, as well as most survey participants think it is relevant to adapt production, processing or transportation means to weather-related extremes or changes and already have adaptation measures in place. Only a few think that it is not relevant, with four not having implemented any measures so far. While most producer organisations implement adaptation measures, these are not embedded in a broader or systematic risk management system. Around 75 % of the survey participants state that there is no risk management at the cooperative level.

**The practiced adaptation measures comprise a range of activities (see figure 8), with a particular focus on crop (75 %), soil and water management** (66 % respectively). These are followed by alternative sources of income (50 %), land management practices (36 %) and the use of weather information (3 %). Less than 10 % of the producers or producer organisations report using financial and insurance instruments (see also below).

In **crop management**, most participants (60 %) shift to more resistant varieties, implement an integrated pest and disease management (50 %) or make use of intercropping/agroforestry (40 %). Several use crop rotations or shift to other crops. Additional implemented adaptation measures are:

- Digging a water pond in the rice field (as trial action) to collect rainwater for seedling production (the rice fields of producers are rain fed areas)
- Applying shade management between crops, intercropping and agroforestry (coffee)
- Slashing and mulching (coffee)
- Adapting pruning dates, monitoring harvest indices.

Commonly applied **soil management** practices include using green manure (75 %) and mulching the soil to capture soil moisture (63 %). Minimal or zero tillage, direct sowing, contour ploughing, enrichment planting, as well as fencing or the sowing of live barriers to encourage natural regeneration or to counteract soil erosion are some of the other soil management practices used. Other activities to adapt soil management include organic farming, incorporation of organic matter or the use of organic fertilisers.

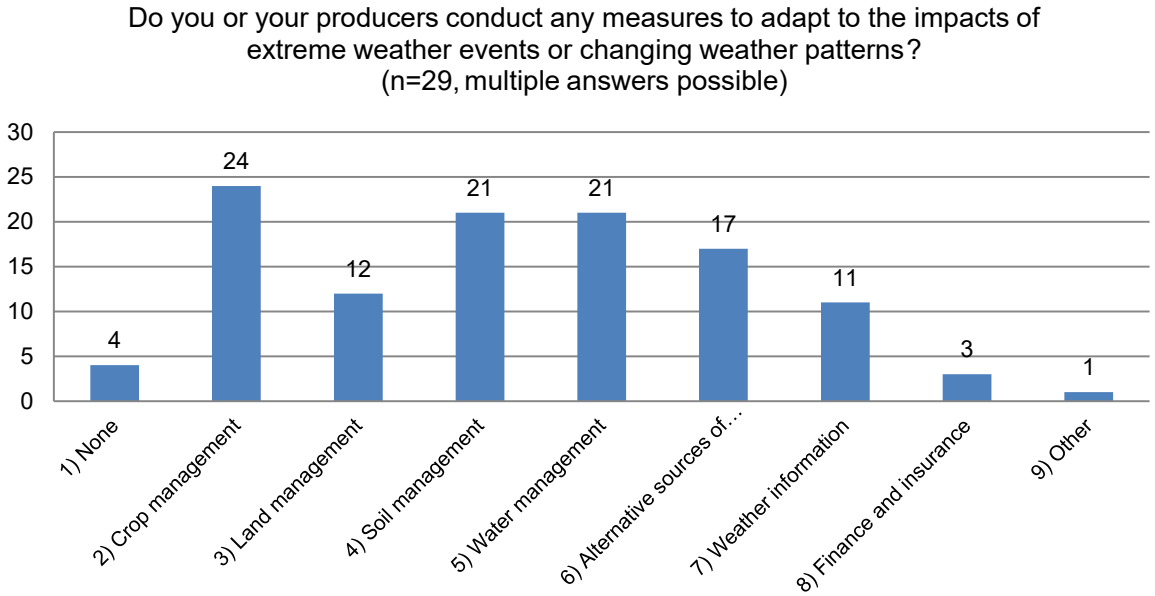


Figure 8: Concrete adaptation measures practiced.

As many climate risks relate to **water availability**, water management plays a pivotal role in adapting value chains to climate change. Practiced adaptation measures often include improved water harvesting and retention systems such as pools, dams, pits, retaining ridges, micro catchment or harvesting. Also, surface irrigation systems or drip irrigation are applied in tandem to improving the efficiency in consumption. In the area of general land management, reforestation and afforestation is the most practiced approach followed by land terracing and contour farming, and watershed management.

**Practices to diversify income are applied by 50 % of Fair Trade actors (producers, producer organisations, cooperatives and cooperative unions, and traders, exporters and the promoting body) in order to manage financial risks**. Activities are taken inside and outside the agro-pastoral sector, including the diversification of crops, banana planting projects on grounds also used for coffee, setting up apiaries for honey production or raising duck and fish in rice fields. Composting of coffee and sugar cane waste and selling it at a subsidised price to the producer is another diversification practice.

While income diversification is widely applied as a financial risk management approach, **only around 10 % of Fair Trade producers or producer organisations apply insurance as an adaptation measure, so far**. This comprises crop insurance, access to credits for climate smart technologies and the supply of insurance. Overall, awareness on the financial risk management and transfer options seemed to be low among the interviewed Fair Trade actors.

**Use of weather information is applied by only around one-third of the producers to manage climate risks.** This includes the use of weather and climate information systems, forecasts, early warning systems or agrometeorology stations.

### How GEPA's tea, coffee and honey producing partners adapt to climate-related changes – examples from India, Tanzania and Mexico

- **Tea Promoters India is primarily making use of soil management practices.** They plant four to five different varieties of soil binders, such as weeping love grass, and apply mulch to the soil to capture more moisture. Furthermore, they periodically participate in the Indian Tea Research Institute's trainings on tea varieties and production practices. By doing so, the tea producer aims at reducing the negative impacts of heavy rains and stronger monsoons. Furthermore, TPI has insurance for its crops.
- **Even though KCU struggles with irregular rainfall and water scarcity during the flowering and fruit development periods, as well as a reduction in natural spring water, the predominant adaptation measures are crop management approaches.** The coffee producers have been replacing old plants with drought-tolerant and disease-resistant coffee varieties from the Tanzanian Coffee Research Institute. KCU complements the introduction of more resilient plants with the use of pesticides and fertilisers to increase production and quality of the coffee beans. At the same time, farming techniques such as planting shade trees, erosion control and mulching are applied, and conversion to organic agriculture has become an important step for the Cooperatives. Furthermore, KCU aims to reduce the use of firewood within production areas by supplying members of the cooperative union with subsidised energy-saving stoves, a project supported by GEPA and El Puente.
- **Crop management is also the main adaptation strategy of EDUCE in Mexico.** The producers engage in the reforestation of melliferous flora and move beehives to areas where the flower blooming is occurring. This approach, however, poses the risk of entering regions with genetically modified organisms that could endanger the health of the bees and that is not allowed under EDUCE as the cooperative promotes organic beekeeping. Outside the flowering season, the farmers provide food for bees to maintain a stable population. Regarding finance, the farmers and the cooperative are less well prepared. They have little savings to use in case of emergencies in production and processing. However, they do have freight insurance, which means the producers' product is insured against transportation risk.
- Annex 3 provides an overview of perceived hazards, impacts on production and responses by TPI, KCU and EDUCE.

Box 3: How GEPA's tea, coffee and honey producing partners adapt to climate-related changes – examples from India, Tanzania and Mexico

### 3.1.3 Adaptation benefits - effects of the Fair Trade model for producers

Fair Trade producers that implement adaptation measures have observed positive impacts of these measures. According to the survey results, positive outcomes include overall higher resilience of farmers to weather variations, such as droughts, greater soil fertility, better water efficiency, a reduction of forest deterioration and negative effects of environmental destruction as well as raised awareness and greater willingness to learn new ways of producing. Some respondents report decreased costs, increases in production and yields, which has resulted in more income.

TPI has observed improved soil quality and fertility in their tea plantations due to newly introduced organic farming practices. The number of plants, insects and wildlife is perceived to have increased thanks to the reforestation programs in all tea plantations while operational costs have decreased. An additional effect of these adaptation strategies seems to be the enhanced well-being of the local communities TPI works with.

A cooperative union from Uganda producing coffee has seen a rise in coffee yields from 0.7 to 2 kilograms per coffee tree by farmers who have introduced adaptation measures.

Adaptation measures that were perceived to be effective include, mixing different strategies, ecosystem-based approaches (e.g., using organic matter for soil fertilisation, agroforestry), changing to more resistant crops, and using more effective production methods.

**Effects of the Fair Trade system on vulnerability**
Being a Fair Trade producer can be helpful in dealing with climate risks, according to survey participants. More than 85 % of the producer and producer organisations state that their profit has increased since they have been engaging in Fair Trade. However, Fair Trade actors have mixed views about the extent to which producing fair or being part of the Fair Trade system affects their vulnerability to climate risks. Whereas 12 stated that it does not affect their vulnerability, 10 responded that the Fair Trade model decreases their vulnerability and 6 thought that it increases their vulnerability.[10]

**The listed factors that may decrease vulnerability include[11]:**

- Stable prices (based on the Fairtrade minimum price)[12]
- Fairtrade premiums (incl. premiums for the communities' and producer's social activities)
- Conservation of economic, social and natural resources decreases vulnerability
- Fair Trade customers are dedicated and committed to motivating producers to improve livelihoods in their communities and to continue to comply with Fair Trade regulations
- Raised awareness through training of farmers and community members on climate change
- Encouragement of producers to plant trees and promotion/support for farmers to plant trees
- Environmentally sustainable practices as daily production practices of smallholder farmers

Also EDUCE, TPI and KCU have noticed several improvements since becoming Fair Trade actors and perceive the trade model as beneficial. Important assets for reducing general vulnerability are the strong and long-lasting relationships between importers and producers, stable and fair prices, and trainings of producers, which include guidance about sustainable practices. Improvements in community life and social aspects, as well as improved working conditions are seen as important results.

**Additionally, some Fair Trade importers will buy products of lower quality without imposing contractual penalties**.[13] KCU, for example reported difficulties in coffee drying due to changes in rainfall patterns, leading to decreased coffee quality and potentially quantity, resulting in delayed lots for the buyers. Where possible (i.e. where the flavour was compatible and supply available), GEPA substituted delayed lots with coffee from other origins in blends. Single origin coffees, however, cannot be substituted.

Also, **direct financial support** in response to impacts due to weather extremes has helped producers to reduce negative impacts. When the TPI plantations were destroyed by a flash flood, GEPA assisted TPI in buying new saplings and in rebuilding a village that was destroyed. Access to this support was simplified, with short proposal-writing and reporting procedures. TPI stressed that financial support for urgently needed activities was facilitated specifically by Fair Trade importers and stressed the benefits of strong trade partnerships.[14] GEPA benefited as well. All contracted tea from TPI was made available to GEPA while, according to TPI, other contracts could not be fully fulfilled.

10 4 survey participants indicated "I don't know", (n=32)
11 The listed factors are based on the survey (Q56: "Please specify how and why your vulnerability is affected.")
12 When prices for products traded on the stock exchange are below the fair-trade minimum price (set for wide range of products as covering costs and aiming to ensure a livable existence), the fair-trade minimum price is paid, plus a premium, plus organic surcharge (if applicable) and when stock exchange prices are above the fair-trade minimum price, the higher prices are paid.
13 According to fair-trade standards and principles, penalties or discounts are not allowed, and the fair minimum price applies
14 "*GEPA understands us and we come to a common agenda, so the relationship is helpful.*" (Gautam Mohan, TPI)

**Besides the positive factors associated with being part of the Fair Trade system, producers also highlighted general factors and experiences that can increase vulnerability, including that of Fair Trade producers.** One factor is the high production standards of the Fair Trade system, which may not be possible to meet when of adverse conditions affect crop quality. If high production standards lead to less crops being produced, vulnerability might be further exacerbated.

Other factors which were seen to increase the vulnerability of producers or producer organisations, include the risk that climate-related impacts could inhibit the fulfilment of contracts, and finally that producers may decide to change their products in favour of others that might be more profitable in the short term or to simply stop producing and migrate to the city.

Measures that decrease the vulnerability of producers can, however, increase the vulnerability of the trade organisation (see section 3.2.2).

### 3.1.4 Support received and support needs

Most respondents (75 %) mentioned that they do not benefit from governmental programs or development cooperation support to adapt to extreme weather events or changing weather patterns. Only a minority of respondents are members of a local, regional or national network or association that provides support in coping with climate risks. As previously mentioned, TPI occasionally participates in the Indian Tea Research Institute's trainings on tea varieties and production practices. KCU collaborates with the national Coffee Research Institute on drought-tolerant and disease-resistant varieties. EDUCE has not received any support from any organisation so far.

The support offered in almost all cases stems from civil society organisations (e.g. by Christian AID, Earth Net Foundation, Agroideas y Pinia or Lutheran World Relief). Support was in part related to climate protection (e.g. carbon foot printing). Out of all 32 survey participants and the three interviewed producer organisations, only one indicated having received public development assistance.[15]

**Support needs**
Finance and training for the implementation of (climate) risk management measures are the priority support needs for survey participants. For two-thirds (66 %) of the survey participants, financial support for the implementation of risk management measures is key. One-third (34 %) would welcome trainings on climate risk management and adaptation to climate change and one-quarter (25 %) would like support for awareness raising about the impacts of climate change among producers. Awareness raising about the impacts of climate change on society, and improvement of infrastructure, such as transport, water, energy or communication were cited by approximately one-fifth of respondents as priorities (both 21 %). Support needs for political advocacy work ranks lower (13 %). Other support-needs topics are to receive help with:

- The preparation of long-term contracts for production planning,
- Accessing Fair Trade markets with organic products, and
- Boosting resilience of new plantations to climate impacts

Producers are often not familiar with climate change terminology and receive little information around climate change and its impacts. According to the interviews with the three GEPA producing partner organisations and an interview with a civil society actor in Latin America, capacities (staff time, financial resources, technical expertise) to formulate project rationales and proposals to request support are rather limited. However, producer organisations do have heightened awareness of changes to local micro-climates and the resulting impacts on production cycles and crops.

KCU in Tanzania would like to scale up its climate risk management initiatives. The switch to organic farming practices, which is motivated by the Fair Trade producers, is very important to the Tanzanian coffee cooperative. Another top priority is to expand the use of more efficient cooking stoves in order to reduce the use of firewood with its smoke emissions and thus mitigate greenhouse gas emissions, and a third priority is to replace the traditional coffee plants with more resilient varieties. The Tanzanian Coffee Research Institute is already supporting KCU with the provision of more resistant plant varieties.

EDUCE in Mexico has not received any support so far, due in part to the small size of the honey sector. EDUCE staff articulated the need for training and research, new bees and equipment for storage, natural pesticides to keep away moths and awareness-raising for consumers to understand the threats of climate change to the producers.

15 The received public development assistance was provided by the Belgian development cooperation agency Belgian Technical Cooperation (BTC).

## 3.2 Climate risks, adaptation measures and support needs in importing countries

### 3.2.1 Climate risks

The myriad of climate risks for producers and actors in producing countries seldomly remain in isolation. As the analysis shows, the risks get passed on along the value chain and also affect actors in importing countries, even if to a much lesser degree.

Fair Trade actors in importing countries include Fair Trade civil society organisations, Fair Trade service providers (e.g. coffee roasting, chocolate manufacturing)[16], Fair Trade importers, conventional value chain actors that may have some Fair Trade lines within their predominantly conventional product lines, and Fair Trade retailers.

Fair Trade civil society organisations, and Fair Trade service providers have so far not been facing any direct climate risks. Fair Trade service providers such as coffee roasters, tea packers or chocolate manufacturers, are mostly aware of climate change impacts at the production level. Those that source products themselves, count with detailed knowledge and experience. Those that do not source products themselves and do not create the finished product, (i.e. where a Fair Trade importer supplies the product for processing) knowledge about climate change challenges in producing countries is limited. All service providers, which were contacted for expert interviews or email surveys, have not yet experienced negative impacts due to climate change within their roles as service providers to GEPA.

Fair Trade importers predominantly face secondary or indirect climate risks. Given the short value-chains, these stem almost exclusively from adverse effects of climate-related impacts in producing countries. As outlined in the previous section, loss of production is the major risk.

**The following list outlines risks for Fair Trade actors in importing countries that are carried forward from the producing countries and were identified by participants in this study**:

- The quality of the agricultural product is low or heterogeneous
- The contracted amounts are not available, are insufficient or are delayed
- Insufficient supply resulting from reduced quality and quantity of products, as well as unfulfilled orders, leads to loss of income and market share
- Contractual penalties may be implemented by retailers if contracted lots are not delivered, and
- Loss of customers and sales market due to loss of shelf-space (no sales opportunity in the supermarket)

Whereas conventional importers usually balance these risks by switching suppliers, Fair Trade importers are bound by long-term partnerships, as well as certified production standards as part of their business philosophy. Building up new trade partners is time-consuming and would require market growth. Furthermore, the offering of Fair Trade producers is limited, new products require certifications, which in turn need time, resources and financing.

### 3.2.2 Adaptation measures practiced

As illustrated by some of the examples outlined above, the three interviewed Fair Trade importers, GEPA – The Fair Trade Company, El Puente and Weltpartner e.G. already employ several measures to reduce climate risks. However, according to interview partners, climate change adaptation has, thus far, scarcely been addressed systematically. The clustered examples below provide an overview of adaptation measures, which have already been practiced by the interviewed Fair Trade importers.

1. **provide grants to producer organisations to protect production and/or processing against impacts of weather and climate extremes and/or to compensate loss and damages**
   - In 2018, one Fair Trade importer provided funds to build a greenhouse for tea saplings to replant areas damaged by flooding from heavy monsoon rains. These measures could not compensate all production losses and, therefore, TPI could not fulfil all contracts with importers.
   - The **financing** of adaptation measures is acknowledged by some importers as part of their support function (see, for example, the Indian case study on tea production and sapling production).
   - Financial support is being provided by importers for reforestation. GEPA supports a reforestation project with sugar partner Alter Trade Philippines Inc. (ATPI).
   - Fair Trade civil society support producers with technical advice, assistance for project implementation and/or provide support to access funds.

2. **provide pre-financing for a product to facilitate liquidity for producers**
   - Another measure that Fair Trade importers are offering to producers is to pay for a product based on its anticipated harvest and the raw material/product supply within the production cycle. By taking on the risk, importers are supporting producers e.g. to bridge liquidity bottlenecks in the event of climate-induced production losses and recover their investment in the next harvest season. Providing pre-financing is a mandatory requirement for Fair Trade importers.



16 Providers who exclusively distribute fair-trade products are rare. Most providers process fair-trade products as well as conventional products.

3. **balance production losses with price mark-ups**
   - One Fair Trade importer balanced production losses in terms of quantity and/or quality in producing countries by compensating producers through price mark-ups. However, while price mark-ups can be passed on to dedicated Fair Trade retail stores (One World Shops), it is more difficult in the case of conventional retailers and would have to be absorbed by the importer.

4. **change processing and blending practices to substitute lower quality or delayed lots**
   - The supplied product has been used, where possible and in some cases quality decreases were made up for, by processing and blending (e.g. coffee) rather than returning the whole lot and causing financial losses on the producer side. However, single origin coffees cannot be substituted as the below example demonstrates.
   - One Fair Trade importer had a specific Panamanian coffee in its portfolio, but due to coffee leaf rust, the producer organisation stopped producing coffee despite financial support by the importer. As a consequence, the product was no longer available to the importer and had to be removed from the portfolio. Only in some cases was it possible to offer a Colombian coffee alternative.

5. **contract higher volumes of produce from several partners to absorb production fluctuations**
   - Due to fluctuations in harvests and changes in product quality, more produce than necessary may be contracted from several trading partners. This practice helps to ensure that the importers can cover their demand.

6. **diversify trading partners and countries**
   - One Fair Trade importer is spreading risks by expanding its portfolio of countries and regions where it sources products, thereby attempting to mitigate against potential production losses. This approach is only suitable as a risk management strategy if the importer is interested in enlarging its portfolio, since trading partners/countries are usually aiming for long-term partnerships.

The examples of adaptation measures taken illustrate that Fair Trade importer buffer risks for producers. While these measures reduce the vulnerability of producers, they can increase the vulnerability of the trade organisation as importers carry the financial risk, including the risks of contractual penalties by their customers.

### 3.2.3 Adaptation benefits – effects of the Fair Trade model for importers

Some adaptation measures undertaken by Fair Trade importers not only protect themselves from climate risks/shocks, but also benefit the producers (for comparison, see section 3.1.3). Some measures that have been applied, e.g. to buffer production losses, have led to negative effects for importers. For example:

In order to avoid shortages in honey supply, GEPA in 2018 bought more honey than it needed to protect itself against supply shortages. In the following year, the market price for honey decreased, but since GEPA had ordered large quantities at higher prices and had to sell them at lower market prices, it led to losses for GEPA. Contracting higher volumes than actual expected demand is a common practice among trade actors. While this can buffer against production impacts (for comparison, see section 3.1.2), it may increase the vulnerability of Fair Trade importers.

Buffering climate risks of producers by using own resources, while at the same time facing potential contractual penalties by the customer in case of non-compliance put the importer under financial pressure.

### 3.2.4 Support received and support needs

Fair Trade importers can play an important role in addressing climate risks along their value chains, but they have received little support so far.

**The following support needs and entry points have been expressed by Fair Trade importers:**

- **Provide access to financial resources** for activities that increase climate resilience in Fair Trade value chains, including for producers as well as importers. This can also include the provision of finance for dedicated staff working on climate risks in value chains, which most Fair Trade companies cannot afford, particularly after the Covid-19 crisis.
- **Develop best practices and guidance on how to implement risk management systems and specific adaptation measures in Fair Trade value chains**, including information about their advantages and disadvantages, their costs, lessons learnt.
- **Establish value chain partnerships to generate joint funding proposals to enhance climate resilience. Examples of partners are** Fair Trade civil society organisations, Fair Trade service providers, Fair Trade importers and Fair Trade retailers).
- **Raise awareness about climate risks and the benefits of adaptation to climate change among Fair Trade actors**; promote cooperation and exchange among them.
- **Address climate risks and the benefits of adapting to climate change in marketing materials**, e.g. raise awareness on the need to climate-proof Fair Trade value chains vis-à-vis conventional and Fair Trade retailers, as well as end consumers. While awareness on the carbon footprint of products has risen in the past years, awareness about the risks due to climate change impacts has only indirectly been addressed by marketing concepts so far.

# 4. Main action areas and examples of support approaches from German development cooperation (DC)

The German development cooperation portfolio already has experience with approaches and tools for climate risk management to address the risks mentioned in chapter 3. While these can be potential starting points in support of Fair Trade actors, they have not been tailored to the Fair Trade system and its value chains and/or the particular situation of small-scale producers. They, therefore, almost all need to be further developed and adapted.

In the following two sections and based on the main risks and support needs outlined in the previous chapter, the study identifies priority action areas which are relevant for reducing climate-risks as well as examples of existing support approaches **both Fair Trade actors in producing countries (section 4.1), and actors in importing countries (section 4.2)**. The examples draw on existing policies, instruments and initiatives from German development cooperation.[17]

## 4.1 Action areas and examples of support approaches for Fair Trade actors in producing countries

Chapter 3 has shown that weather- or climate-related events to date have primarily affected producers. Negative effects and climate risks were most notable in terms of reduced quantity and quality of the respective products, increased production costs and impacts on transportation. Water availability was the main challenge for production and processing. General awareness about the potential impacts of climate change is high and most producer country actors have started to implement adaptation measures.

Nevertheless, increased awareness raising about climate risks was still mentioned as a need by producers and producer organisations, as this was perceived to be insufficient. In addition, very few producers apply systematic risk management approaches. In this respect, **access to finance and training for the implementation of risk management measures and adaptation to climate change were mentioned as priority support needs by survey participants**. Furthermore, and related to the demand for training, support for strengthening awareness about the impacts of climate change among producers (and/or identifying needs for building greater resilience in instances where awareness is already high), as well as improving public infrastructure such as for transport, water or energy supply, as well as communications infrastructure were mentioned as priorities.

**With a view to these main risks and support needs, five action areas are particularly relevant for reducing climate risks for Fair Trade producers or producer organisations:**

1. Strengthen training and learning opportunities on climate risks and adaptation options for producers;
2. Introduce – or where applicable strengthen – systematic climate risk management for producers and producer organisations in order to ensure the quantity, as well as quality of the produce, and to maintain constructive business relations that are able to bridge times of reduced production output. Priority should be given to climate risk management approaches at cooperative and farm-level, access to producer-oriented climate change information and climate services, climate risk assessments at farm-level and climate-resilient agricultural production at the farm-level (particularly including water management).

By comparison with impacts on production, processing was seen to be less sensitive to climate risks. Nevertheless, since processing is an important step in the value chain, and since it can be affected by climate risks as shown in chapter 3,

- reducing climate risks in processing is another important area to be considered as part of a systematic risk management approach for producers, producer organisations or respective business partners that conduct processing.[18]

17 The goal of this section is to highlight examples only. It is not the intention to provide a comprehensive overview. The study does not provide an exhaustive list of the (GIZ) examples mentioned.

18 Processing can be conducted completely or partially by the producers or producer organization, but also by specialized actors other than the producers. In order to simplify the presentation of potential solution pathways, processing is subsumed under 'systematic climate risk management for producers and producer organisations.

3. Improve access to *finance and financial risk management approaches for producers,*[19] including insurance;
4. Improve the climate resilience of public infrastructure, especially for transport, water and energy supply;
5. Strengthen producer organisations and Fair Trade value chains with overarching approaches.

Table 1 provides an overview of the main action areas, potential support approaches Fair Trade and provides practical examples from German development cooperation. While each of the practical examples has been paired with one of the priority support needs, some of them also address several risks or challenges at the same time and could therefore offer ideas and valuable lessons for other priority areas, as well. The suggested activities and examples will be briefly outlined further in the subsequent section.

19 Financial risk management approaches are conceptually part of a 'systematic climate risk management approach'. In this analysis it is listed separately to highlight it as a priority need for producers and producer organisations.

| Main action areas/support needs | Potential support approaches | Examples of existing support approaches/ activities within German DC |
|---|---|---|
| 1. Strengthen training and learning opportunities on climate risks and adaptation options for producers | 1.1 Adapt existing learning materials<br>1.2 Facilitate learning and exchange | Adaptation to climate change in the agricultural sector of southern Africa (ACCRA) (project completed)<br>Initiative for Sustainable Agricultural Supply Chains (INA)<br>Global Coffee Platform<br>develoPPP.de program (Initiative for coffee & climate). |
| 2. Introduce systematic climate risk management approaches for producers and producer organisations | 2.1 Introduce and implement systematic climate risk management approaches, incl. at cooperative and farm-level | Climate Risk Management (CRM) framework and Climate<br>Promotion of a Diversified and Sustainable Livestock Production (ProCadenas Paraguay) on risk assessment and management in livestock value chains in Paraguay (project completed). |
| | 2.2 Improve access to producer-oriented climate change information and climate services | Climate Risk Analyses and Profiles (PIK project AGRICA/GIZ)<br>ThinkHazard! Tool<br>Adapting agriculture to climate change project (PrAda) on climate services<br>Promoting climate risk insurance and climate risk information in the agricultural sector on climate risk information (CRIIZ) – Zambia |
| | 2.3 Introduce climate change risk assessments at farm-level | Climate Expert tools<br>6-step climate risk assessment (CRA) methodology |
| | 2.4 Support climate-resilient agricultural production at the farm level, including water management | Green Innovation Centres for the Agriculture and Food Sector (GIC) |
| | 2.5 Reduce climate risks in processing | Promotion of a Diversified and Sustainable Livestock Production (ProCadenas Paraguay)<br>Water and Energy for Food (WE4F) at production and processing level |
| 3. Improve access to finance and financial risk management approaches for producers | 3.1 Improve access to finance for climate risk management activities | Global Project Promotion of agricultural finance for agri-based enterprises in rural areas<br>Fairtrade Access Fund (FAF)<br>Covid-19 Fair Trade Emergency Initiative / Fairtrade Producer Relief Fund<br>Coffee Innovation Fund |
| | 3.2 Improve access to financial risk management approaches, including insurance | InsuResilience Global Partnership (and Global Index Insurance Facility (GIIF))<br>Access to Insurance Initiative (a2ii)<br>Disaster Risk Finance and Insurance (CDRFI) instruments<br>Promoting climate risk insurance and climate risk information in the agricultural sector (CRIIZ) – Zambia / Indexed microinsurance for smallholder farmers in Zambia<br>Parametric Weather Protection in Tanzania<br>Adapting agriculture to climate change project (PrAda) on climate risk insurance<br>Promotion of a Diversified and Sustainable Livestock Production (ProCadenas Paraguay) |
| 4. Improve climate resilience of public infrastructure | 4.1 Public support for improving infrastructure including for transport, water or energy supply | Project Promotion of agricultural finance for agri-based enterprises in rural areas<br>Project Sustainability and Value Added in Agricultural Supply Chains<br>Sector Programme for "Promoting sustainable agricultural supply chains and standards"<br>Green Innovation Centres for the Agriculture and Food Sector (GIC) on holistic innovation approaches<br>Climate Services for Infrastructure Investments (CSI) and PIEVC Program |
| 5. Strengthen producer organisations and Fair-trade value chains with overarching approaches | | Fairtrade's Producer Network<br>Colombia Coffee Growers Federation<br>Global Project Promotion of agricultural finance for agri-based enterprises in rural areas<br>"Promoting sustainable agricultural supply chains and standards"<br>Sustainable Agricultural Supply Chains Initiative (INA) |

Table 1: Overview of main action areas and support needs in producing countries and examples of existing German DC support approaches

### 4.1.1 Action area 1: Strengthen training and learning opportunities on climate risks and adaptation options for producers

**Core activity 1.1:** Adapt existing learning materials.

Training manuals, guidelines and web portals can strengthen awareness about the impacts of climate change among producers and on society. Support elements, which could be adapted and applied for Fair Trade actors, can be found in existing manuals, instructions, trainings, and guidebooks, and include:

- Portals such as Global Coffee Platform for information exchange among smallholder coffee farming families and/or producer organisations;
- The Initiative for Sustainable Agricultural Supply Chains (INA)[20] as an information platform for producers, private sector, civil society, and politics with expertise on the agricultural commodities natural rubber, soy, palm oil, banana, coffee, cocoa, orange juice, cotton;
- The training manual of the Climate Proofing Tool. The climate proofing tool is a tool that focuses on climate change adaptation in agriculture in southern Africa and on knowledge co-generation. The tool can be combined with a training package comprised of different technical/topical modules related to climate change in value chains.[21] German DC together with the private sector has furthermore developed training manuals to support smallholder farmers in increasing their climate change resilience and adaptation capacity. Examples are:
- The training manual to Adapt to Climate Change for Kenyan Tea Farmers[22]
- The training manual on Climate Change Adaptation and Mitigation in the Kenyan Coffee Sector[23]
- The coffee&climate intiative with a toolbox on adaptation in coffee production and a sourcebook in several languages.

The above initiatives, trainings and tools can also serve as an information source and guidance for Fair Trade producer/producer organisations about climate change adaptation. The Sustainable Agriculture Supply Chain Initiative (INA), a service provider and implementation platform, could be developed further to support Fair Trade producers and strengthen local alliances with its cross-commodity approach.

**Potential Support Approach 1.2: Facilitate learning and exchange**

Providing learning and exchange opportunities for value chain actors on climate change related topics and exchange of respective knowledge and experience is important for transferring knowledge into action and should be considered as an additional support approach for Fair Trade actors.

### 4.1.2 Action area 2: Introduce systematic climate risk management approaches for producers and producer organisations

**Potential Support Approach 2.1: Introduce and implement systematic climate risk management approaches, including at cooperative and farm-level**

Climate risk management for producers is key to identifying in a holistic and systematic way the risks that can arise for producers of a certain product in a certain context. According to the survey, 75 % of participants indicate that there is no risk management at the cooperative union or producer level.

The following frameworks, methodologies and examples could be used to inform the development of climate risk management approaches:

- Climate Risk Management (CRM) approaches, such as the CRM framework, help to analyse and assess climate risks, to identify measures and instruments for CRM and to implement decisions. The framework consists of climate change adaptation and disaster risk reduction lines of research. A potential support approach might be to conduct trainings for Fair Trade actors on CRM.
- The Climate Risk Assessment Method Search Engine (CRAMSE) aims to support practitioners in identifying risk assessment methods that best fit their specific purposes. Its database encompasses more than 120 climate risk assessment methods.[24]
- The project ProCadenas (*Promotion of a Diversified and Sustainable Livestock Production*) in Paraguay employs a holistic approach to managing climate risks through improving awareness, building capacities among value chain actors and experts, and increasing access to risk management tools.

**Potential Support Approach 2.2: Improve access to producer-oriented climate change information and climate services**

Information about the effects of climate change are a precondition and an essential part for climate risk management in order for producers to identify the most suitable adaptation measures. Access to such information for producers remains a challenge, as the survey has indicated, and climate literacy is often low.

Improving access to climate change information that can inform decision making of Fair Trade producers is, therefore, key. This could include information on the effects of climate change on a region, a sector, a product or it could even be value-chain specific, including for example information about how public infrastructure will be affected.

20 The INA is an association interacting with commodity-specific multi-stakeholder partnerships, implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

21 Provided by the Centre for Coordination of Agricultural Research and Development for Southern Africa (CCARDESA)

22 Developed by the Ethical Tea Partnership and GIZ

23 By ECOM Agroindustrial Corporation Limited, 4C Association, Tchibo GmbH, the World Bank and GIZ

24 A range of filters, including economic sectors covered, climate-related hazards considered, geographical coverage of the analysis, the inclusion of non-economic losses and damages and further can be applied.

Examples of German DC, which could be tailored further to the needs of Fair Trade producers include:

- The project "AGRICA – *Climate risk analyses for identifying and weighing adaptation strategies in sub-Saharan Af*rica", which conducts comprehensive climate risk analyses for the agricultural sector in the Sahel region and sub-Saharan African countries. The risk analyses look into existing and future climate risks with a high spatial resolution under different emissions scenarios. The analyses are based on evolving trends for temperature and precipitation, future water availability and the country's suitability to grow crops. Projections go up to the year 2090, offering opportunities not only to look into short-term trends (2030), but also to take medium (2050) and long-term (2090) climate change impacts into account. On this basis, suitable adaptation strategies for the local context are proposed and verified by a cost-benefit analysis (see chapter 4.2. for further information on the suitability of the AGRICA project).[25]
- The ThinkHazard! tool was designed to provide information about hazards for a given location that should be considered in project design and implementation to promote disaster and climate resilience. It highlights the likelihood of different natural hazards affecting project areas, provides guidance on how to reduce the impact of these hazards, and where to find more information. The hazard levels provided are based on published hazard data, provided by a range of private, academic and public organizations. It addresses hazards beyond weather extremes; however, it does not include information on hazards that might arise because of climate change.
- The economic modelling approach for adaptation and development planning offers macroeconomic models for climate resilience (Project Climate-Resilient Economic Development, CRED). The approach enables capacity building in terms of human capacity (providing methods and instruments for self-sufficient enhancing of adaptation strategies) and of technical capacity (improving datasets and developing macro-economic modelling).[26]

**Potential Support Approach 2.3: Introduce climate change risk assessments at farm-level**

Climate Risk assessments serve as the foundation for successful climate risk management at farm-level. As outlined before, a plethora of methodologies exist, which are. compiled in the Climate Risk Assessment and Method Search Engine, CRAMSE. Some of the more tailored approaches for business actors include:

- The Climate Expert tool. The tool supports small- and medium-sized enterprises (SMEs) in assessing the risks and opportunities related to climate change with a four-step approach: (1) analysing climate change impacts, (2) assessing climate risks and opportunities, (3) identifying adaptation measures and (4) developing an adaptation strategy of SMEs. The tool has already been applied by companies in several countries, such as Kenya, Morocco, Bangladesh, Costa Rica, Nicaragua, and Rwanda. In 2021 the approach was implemented in Kyrgyz Republic, India, Uzbekistan and Tajikistan. A rollout in West Africa and Serbia will follow. Since the implementation of adaptation strategies is often challenging due to financial barriers, the climate expert tool has been expanded to include a module with information about financing opportunities. The financing module considers the local climate finance landscape and helps SMEs to meet the requirements of credit providers in order to implement adaptation measures.
- An advantage of this approach is the systematic support and capacity building targeting local business support organizations, which can then go on to provide adaptation and climate risk services to producers in the country, as part of their service offering.
- The 6-step climate risk assessment (CRA) methodology assesses the impacts of climate risks on people, assets, value chains, (critical) infrastructure, settlements and ecosystems and aims to identify suitable climate risk management options. The methodology has been tested in Tanzania with respect to integrated water resources management and drought risk, and in India to identify risks from slow onset processes and extreme weather events on coastal and mountain hotspot areas, with a focus on rural livelihoods and critical infrastructures.

The specific support approach for Fair Trade value chains is not yet part of the Climate Expert tool. Although the tool's approach is designed for SMEs, it might be able to provide support to farmers and/or cooperatives when the tool is adapted to producer needs. A newly developed module on adaptation finance, as well as an adapted tool for agricultural smallholders are planned.

Beyond information about mid- and long-term climatic changes, providing access to climate or agrometeorological services by providing e.g. weather forecasts or early warnings on hazards can reduce impacts during the production stage.

Examples of such services are:

- The Climate Risk Insurance and Information in Zambia (CRIIZ) project aims to expand smallholder's access to climate risk information and offers capacity training to various stakeholders involved in disseminating climate risk information (for comparison, see chapter 4.1.3.).
- The adapting agriculture to climate change project (PrAda) offers improved access to climate services for smallholders and enables actors in the value chain to have better access to agrometeorological and agricultural advisory services.

25 Implemented by the Potsdam Institute for Climate Impact Research (PIK) for the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ); further publications: AGRICA Project / Climate Risk Analysis / Climate Risk Profiles – Adaptation Community

26 CRED brings national modelling authorities in developing countries together with adaptation and economic experts in Germany, in order to create long-term economic models to assess the macroeconomic impacts of climate change and adaptation measures: giz2023-en-cred-project-review.pdf

**Potential Support Approach 2.4: Support climate-resilient agricultural production at the farm level, including water management**

German DC already supports various approaches and activities, which aim at enhancing climate-resilient agricultural production. Ecosystem-based approaches, such as agroecology (see Box 4) are applied to adapt agricultural production systems to climate change. Since most Fair Trade organisations apply organic standards, trainings on agroecological practices might be suitable to strengthen climate-resilient production practices among Fair Trade producers, as well.

Examples that aim to increase the climate resilience of production of smallholder farmers and/or the value chains addressed in this study, and which could also be relevant for Fair Trade producer or producer organisations include the following activities:

- Dissemination of knowledge regarding adjusted crop management (new drought and flood tolerant varieties, greater crop diversity, contour planting, effective water storage and irrigation, trees for soil stabilization and wind breaking, etc.).
- Training for extension officers to advise farmers on climate-smart practices.
- Capacity building for climate-proofing agricultural value chains (including storage practices, processing, seed procurement etc.)
- Improvement of water management
- Fostering innovation among Fair Trade producers

Many of these activities are promoted by the Green Innovation Centres for the Agriculture and Food Sector (GIC). They aim to stimulate innovations along agricultural value chains to increase income and productivity of smallholder farmers and regional food supply in partner regions.[27] In many cases, they focus on new channels for cooperation, such as setting up producer associations, specialised enterprises or interest groups. So far, BMZ has founded 15 Green Innovation Centres in 14 African countries and one in India. Financial literacy and facilitating access to loans for smallholders are part of the approach.

**Potential Support Approach 2.5: Reduce climate risks in processing**

In this study, producers highlighted the climate risks during processing related to water availability, the health of employees and energy supply. Other impacts, such as on farm processing facilities or disruptions of transportation routes could also impact processing. Examples of support approaches that address climate risks related to processing can be identified in the ProCadenas project and Water and Energy for Food initiative:

- In the scope of the Promotion of a Diversified and Sustainable Livestock Production (ProCadenas) project in Paraguay, (for comparison, see section 4.1.2), risk assessments of non-traditional livestock value chains (dairy, beekeeping, aquaculture, goat/sheep) were conducted, including an assessment of the specific risks facing processing. The results are publicly available to all actors along the value chain, including producers and processing companies, via the website of the Paraguayan Ministry for Agriculture and Livestock. The project also offers trainings for producer organisations to assess their own risks and elaborate appropriate risk management strategies (e.g. use of insurance), strengthen collaborative channels between the public and private sector, and facilitate greater integration of farmers within national and international markets.

**Agroecology – a transformative approach to enhance resilience**

- Agroecology is a holistic concept and provides guidance on transitioning to a more sustainable agricultural and food sector. The term can be understood as a (1) scientific discipline, (2) a set of farming practices and (3) a social movement.
- In line with the planetary boundaries and the model of ecological ceilings, agroecology serves as a suitable transformation pathway for redesigning and reorienting food systems and making them more resilient in the long term.

**How does agroecology work at farm-level?**

- Agroecological practices include location-specific methods (improving biological and ecological processes in production), promotion of positive synergies between plants, animals, soil, water and the agri-food system; diversification (as mixed cropping and intercropping, agroforestry, use of locally adapted seeds, biological pest control, green manure, among others).
- Agroecology has a lot in common with organic farming – in contrast to agroecology, organic farming focuses on the agricultural aspects of agri-food systems and is regulated by clearly defined standards. Organic agriculture serves as an agroecological approach in German development cooperation.

Box 4: Agroecology as a transformative approach to enhance resilience

27 The GIC are part of the special initiative One world - No hunger aiming to support global food security and rural development that increases the resilience to climate change and crises.

- The decentralized approach of the Water and Energy for Food (WE4F) initiative supports smallholder farmers and small and medium enterprises to increase food production along the value chain through a more sustainable and efficient usage of water and/or energy. The initiative may provide new technology within the water-agriculture-food nexus for Fair Trade farmers.

### 4.1.3 Action area 3: Improving access to finance and financial risk management approaches for producers

**Potential Support Approach 3.1: Improve access to finance for climate risk management activities**

65 % of the survey participants highlight access to financial resources as their core need to address climate change challenges. Particularly small-scale agriculture, with its low production volume, tends to generate insufficient economic returns for investments in climate risk management measures. Smallholders may benefit from personal capacity building and knowledge transfer about how and where to access such resources. Funding needs are for measures such as tree planting, slope stabilization through terracing or the application of improved irrigation techniques and of alternative seeds.

German DC has supported access to funds for various actors in partner countries as part of its portfolio. Existing support schemes include:

- The Project Promotion of Agricultural Finance for Agri-based Enterprises in Rural Areas focusing on promoting agricultural and needs-oriented financial services. It aims at increasing financial literacy particularly in rural areas and on connecting farmers with financial services, mostly micro-finance institutions.[28] It cooperates with several African countries,[29] which are also relevant for Fair Trade products.
- The Green Innovation Centres for the Agriculture and Food Sector (GIC) offer support packages with the goal of improving the "finance literacy" of farmers and farmers' organisations so they can more easily get access to loans for the envisaged innovations.
- The Fairtrade Access Fund, i.a. sponsored by Fairtrade International and KfW, offers lending products for agricultural exporters, who work primarily with smallholder farms and have a strong commitment to sustainable development. It supports access to financing (especially long-term capital) and to sustainable markets, both locally and abroad. It also invests and provides technical assistance to projects that support climate change adaptation and mitigation;
- The COVID-19 Fair Trade Emergency Initiative[30] responded to the socioeconomic effects of the pandemic for Fair Trade actors. The COVID-19 Fair Trade emergency initiative aims at reducing the vulnerability of smallholder farmers by promoting direct and rapid response measures (such as financial support, provision of information and training, securing market access), as well as providing measures to ensure their business continuity and the resilience of women producers and producer organizations;
- The Coffee Innovation Fund provides financial support and access to a network in the coffee sector for companies and cooperatives promoting sustainability.[31]

The support approaches of the funds listed above, and of the emergency initiative can be accessed by Fair Trade producers. These approaches already support improved access to funding. So far, the project Promotion of Agricultural Finance for Agri-based Enterprises in Rural Areas has no special focus on Fair Trade producers.

**Potential Support Approach 3.2: Improve access to financial risk management approaches, including insurance**

Implementing climate risk management and adaptation measures can lead to higher production costs for farmers. However, in the absence of investments in risk management and adaptation measures, the climate related losses in production, reduced prices (and, therefore, income) arising from lower quality products and increases in production costs, pose a more severe economic risk. Climate-related losses might include spoilt yields (caused by drought, floods or heat waves) and destroyed farms (caused by soil erosion through heavy rains and/or slope erosion). German DC supports approaches for enhancing resilience through Climate and Disaster Risk Finance and Insurance (CDRFI) schemes to reduce the financial burden of these losses. Support includes macro-level approaches, such as sovereign risk transfer schemes, as well as micro-insurances at smallholder level, which are of particular relevance for Fair Trade producers. Agrobusinesses and producer organisations could also transfer production risk with the help of insurance schemes. Examples of the respective approaches are:

- The InsuResilience Global Partnership for Climate and Disaster Risk Finance and Insurance Solutions was launched by Germany and partners at the 2017 UN Climate Conference in Bonn. The Partnership aims at strengthening the resilience of developing countries and protecting the lives and livelihoods of poor and vulnerable people against the impacts of disasters. As an umbrella programme, it supports several projects related to climate risk insurance across the globe.[32] In order to make a contribution to dealing with

28 See, for example, a short video of the Strategic Alliance "Farmers as Entrepreneurs: Improving the Livelihoods of Smallholders in Uganda"
29 Benin, Burkina Faso, Cameroon, Côte d'Ivoire, Malawi, Mali, Nigeria, Togo, Zambia
30 On behalf of the BMZ, in cooperation with Fairtrade (Germany and International), Forum Fairer Handel e.V. and Deutsche Welthungerhilfe e. V.
31 Financed by BMZ and implemented by INA of GIZ, with projects funded in Ethiopia, Myanmar, Indonesia, Vietnam, Kenya, Rwanda and Uganda so far.
32 Since its start, more than 110 members have joined the Partnership. In 2020, 22 implementing programmes contributed to the

extreme weather events, the group of particularly vulnerable developing countries (Vulnerable 20 / V20, currently 58 countries) and the G7 under the German Presidency launched the Global Shield against Climate Risks (GS) at the COP27 in November 2022. The GS aims to provide vulnerable people and countries with financial protection against the impacts of extreme weather events. It builds on the successes and structures of the InsuResilience Global Partnership (IGP), which has been working on Climate and Disaster Risk Finance and Insurance (CDRFI) solutions with its now more than 120 members since 2017.[33]

- Climate and Disaster Risk Finance and Insurance (CDRFI) refers to pre-arranged financial arrangements and instruments aimed at strengthening financial resilience and providing financial protection for climate and disaster risks. The full potential of these instruments can only be harnessed if they are used in tandem with risk reduction measures – by transferring residual risks that cannot be reduced cost-effectively. CDRFI instruments are, therefore, not intended to be stand-alone approaches. The InsuResilience Global Partnership advocates for CDRFI solutions that are bundled with other elements within comprehensive climate and disaster risk management (CDRM) to enable more resilient, long-term development. Examples of such risk transfer solutions for residual risks are those offered to Tanzanian and Zambian smallholder farmers (see links in table 1).
- The project Climate Risk Insurance and Information in Zambia (CRIIZ) aims to expand smallholders' access to insurance (and climate risk information) to allow them to better manage inherent risks in agricultural production. The CRIIZ project offers capacity training to various stakeholders involved in providing insurance (and disseminating climate risk information).[34] Implementation partners include agricultural companies like contract farming operators and seed companies, microfinance institutions, insurers and climate service providers. On the supply side, capacity building of local insurers supports product innovations. On the demand side, smallholders' understanding of insurance is strengthened and access provided by building capacities of aggregators responsible for awareness, enrolment and distribution of payouts. Despite focusing on micro-level insurance for smallholders, GIZ also advises aggregators on portfolio coverage to manage their risks at the company-level more directly.
- The BMZ supported the creation of the Access to Insurance Initiative (a2ii) in 2009. The a2ii provides capacity building, learning, and advice on access to insurance for policymakers, regulators, and supervisors. The initiative is a partnership between development agencies, donors, and the International Association of Insurance Supervisors (IAIS). A2ii generates and disseminates knowledge about best practices with the aim of promoting conducive regulatory environments, which enable expanding insurance to the vulnerable.
- The project adaptation of agriculture value chains to climate change (PrAda) supports the introduction of climate risk insurance in Madagascar. It creates an enabling framework, increases the capacity of national stakeholders and raises awareness about insurance against climate risks among smallholders.
- The holistic risk management approach of ProCadenas in Paraguay promotes access to financial instruments, including insurance and specialized credit lines for production (value chain finance). For the beekeeping value chain, a hybrid insurance concept has been developed, consisting of two components: a public insurance scheme covering climate risks, and a local mutual insurance scheme covering risk of theft of honey and beehives.
- The private sector partnership between Nespresso and Blue Marble Insurance provides weather index insurance for smallholder coffee farmers in Columbia (Café Seguro). The project aims to expand insurance access to smallholders. *"It utilizes Nespresso's established linkages with cooperatives and their understanding of regional terrain to create a responsive index."* The insurance features a sliding payout model that has progressively larger payouts based on the degree of weather inclemency – building trust with farmers as payouts are not all or nothing. Interestingly, in the first-year, premiums were paid for by cooperatives using Fair Trade funds (generated from the sale of Fair Trade goods).[35] In the second and third year, the government subsidized premiums. This model expands insurance access to value chains and its utilization of existing cooperative structures and Fair Trade funds increase its potential for sustainability.

InsuResilience Vision 2025 with 218 projects in 101 countries. The secretariat is hosted by GIZ.

33 Global Shield against Climate Risks | BMZ

34 GIZ on behalf of BMZ has been supporting measures to protect smallholder farmers against the effects of dry spells / droughts and heavy rain through climate risk insurance since 2017 (Global Project InsuResilience, develoPPP.de project with Louis Dreyfus Company Zambia, Climate Risk Insurance and Information in Zambia (CRIIZ) project and Climate policy support Programme).

35 Crop Insurance For Coffee Smallholders | Nespresso

### 4.1.4 Action area 4: Improve climate resilience of public infrastructure

**Potential Support Approach 4.1: Public support for improving infrastructure such as for transport, water or energy supply or communication facilities**

Even if not perceived as a priority risk by producers or producer organisations, the survey has shown that direct impacts on public infrastructure, such as transportation routes, can have significant negative impacts (40 % of survey participants rely on one transportation route and provider). Similar effects for producers can also arise from adverse impacts on communication facilities or public water and energy supplies. A resilient public infrastructure is, therefore, also relevant for Fair Trade producers and has benefits for the production, processing and transportation of products.

An example of an approach that supports public investment and decision-making is:

- The Climate Services for Infrastructure Investments (CSI) project which advises government agencies and decision-makers in partner countries on the integration of climate services (targeted climate information and risk assessments) into investment planning. The Public Infrastructure Engineering Vulnerability Committee (PIEVC) Protocol is a practical approach for assessing the vulnerability of infrastructure to the potential impacts of climate change.[36]

### 4.1.5 Action area 5: Strengthen producer organisations and Fair Trade value chains with overarching approaches

Several of the before highlighted support needs and support approaches could be supported by strengthening Fair Trade producer organisations or networks, such as the Fairtrade's Producer Network, a network of more than 1,700 producer organisations (solely Fairtrade certified producers) worldwide. As outlined in chapter 3, some producer organisations such as Tea Promoters India (TPI) already have that role. They share knowledge on new and more resilient management practices and crop varieties and even provide improved seedlings. The Tanzanian Kagera Cooperative Union (KCU) Limited propagates soil management techniques such as mulching for capturing moisture and binding soil. The organisation collaborates with the national Coffee Research Institute on drought tolerant and disease-resistant varieties.

There are other producer organisations without a clear focus on Fair Trade that, however, have potential to work with Fair Trade networks. Examples are:

- The Colombia Coffee Growers Federation, which supports their members in economic and social development with consideration of the environment. The Colombia Coffee Growers Federation is linked to the public National Coffee Fund, which supports, among other things, services and research.
- German DC collaborates with farmer organisations to strengthen economic, social and environmentally compatible development of rural areas, while paying attention to small-scale farming structures. An example is the Global Programme on Strengthening Farmers' Organizations for Sustainable Agricultural Development as part of the special initiative One World – No Hunger. The project aims to develop and strengthen farmer organisations that provide better conditions and relevant services for their members. It is also active on sustainable and ecologic farm practices, including related labelling schemes.

Furthermore, there are several initiatives in German DC, which promote the sustainable management of value chains in a holistic way, and which could integrate climate risk management or related aspects into their operations. Next to the Green Innovation Centres (GICs) (see Potential Support Approach 2.4 in chapter 4.1.2) and the Global Project Promotion of Agricultural Finance for Agri-based Enterprises in Rural Areas, the Sector Programme for Promoting A Sustainable Agricultural Supply Chains and Standards and the Sustainable Agricultural Supply Chains Initiative (INA) support entire supply chains, for example related to the production of coffee, cocoa, banana, cotton and rubber. This partly includes Fair Trade value chains.

36 With the assistance of Canadian experts, the GIZ project "Enhancing Climate Services for Infrastructure Investments (CSI)" has applied the PIEVC Protocol in Brazil, Costa Rica, Vietnam and the Nile Basin. Ownership and control of the PIEVC Program has been transferred to a partnership consisting of the Institute for Catastrophic Loss Reduction (ICLR), the Climate Risk Institute (CRI) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.;

## 4.2 Action areas and examples of support approaches for Fair Trade actors in importing countries

As analysed in chapter 3, risks arising for Fair Trade actors in producing, as well as in consuming countries, are closely related to the conditions and mechanisms of cooperation along the value chain. The specific risks for Fair Trade importers are linked to their position between producers and consumers in connection with their assumed mandate for support towards producers and awareness raising towards consumers. The responsibilities along the Fair Trade value chain are shaped in a way that the importers and Fair Trade organisations feel pressure from both producers and consumers.

Chapter 3 has shown that there are three main risk categories for Fair Trade actors in importing countries,[37] in this case Germany. The first encompasses direct risks that result from climate-related impacts on producers. These include the

- availability of contracted amounts of supply which may not be available, may be insufficient or may be delayed; or
- the quality of the agricultural product, which may be poor or heterogeneous.

Secondly, there are risks from cascading effects resulting from the climate-related impacts on producers. These include:

- loss of income, market share and shelf-space in supermarkets due to insufficient supply in terms of quantity and quality as well as due to non-fulfilment of contracts with retailers;
- contractual penalties from retailers if contracted lots are not delivered; and
- loss of customers due to loss of shelf space in supermarkets.

Importers have already started to take measures aimed at both reducing direct impacts on production as well as secondary effects for importing actors, as the examples in section 3.2.2 illustrate. These examples are however not necessarily common and standardised response measures, which are being applied by all Fair Trade importers or for all products. Some of the adaptation examples have been tailored in response to specific situations and longer-term experience is still lacking.

In that respect, more activities are needed that consolidate ongoing efforts with respect to both risk categories. Furthermore, most of the adaptation measures taken so far are targeted at mitigating the direct impacts on production. Potential adaptation measures that could be taken in case a contract is unfulfilled, contract-related penalties or activities that address the communication challenge with customers have so far not been, or hardly been, considered. Whereas German DC offers various approaches that aim to reduce the impacts of climate risks on production, these approaches do not so far address secondary risks.

Thirdly, a major risk that was highlighted as a support need by Fair Trade importing actors, and which relates to both the direct climate-related impacts on producers as well as the cascading effects, are the financial impacts on importers.

Finally, the interview partners indicated overall support needs, particularly related to the climate risk literacy of importing actors, and the further development of the Fair Trade standard.

**Based on the key risks and support needs, five action areas are particularly relevant for importers in order to address climate risks:**

1. Strengthen training on climate risks and adaptation options for importers
2. Reduce the impacts on the quantity or quality of products
3. Reduce the impacts of cascading risks in importing countries, inter alia by disclosing climate risks in the business portfolio; avoiding loss of income, market share and shelf-space due to non-fulfillment of contracts with retailers; by avoiding contractual penalties from retailers if contracted lots are not delivered, and by avoiding loss of customers due to loss of shelf-space
4. Improve access to finance and financial risk management approaches, including insurance
5. Integrate adaptation into Fair Trade standards

Table 2 provides an overview of the main action areas and support needs for the importing country actors, suggested core activities and examples of existing support approaches. The overviews shows that there are no existing support approaches for cascading risks yet.

37 Including fair-trade civil society organizations, fair-trade service providers (e.g. coffee roasting), fair-trade importers, conventional chain actors (e.g. roasters with some fair-trade lines within their predominantly conventional product lines) and fair-trade retailers.

| Main action areas/support needs | Potential support approaches | Examples existing support approaches/ activities |
|---|---|---|
| 1. Strengthen training on climate risks and adaptation options for importers | 1.1 Facilitate learning and exchange | Fair Trade Networks<br>PANORAMA as a cross-sectoral platform<br>Climate Risk Planning and Managing Tool for Development Programmes in the Agri-food Systems (CRISP) |
| 2. Reduce impacts on quantity/quality of products | 2.1 Support climate risk management of Fair Trade producers | See table 1 |
| 3. Reduce impacts of cascading risks in importing countries | 3.1 Disclose climate risks in business portfolio | n.a./ Climate Risk Profiles (CRP) for cooperating countries |
| | 3.2 Avoid loss of income, market share and shelf-space due to non-fulfilment of contracts with retailers | n.a. |
| | 3.3 Avoid contractual penalties from retailers if contracted lots are not delivered | n.a. |
| | 3.4 Avoid loss of customers due to loss of shelf-space, e.g. by enhancing consumer awareness | website "#ichwillfair" (by INA)<br>Trainings and teaching materials (by INA) |
| 4. Access to finance and financial risk management approaches, incl. insurance for de-risking supply chain and products | 4.1 Improve access to funding for Fair Trade importers to support producers | Fairtrade Access Fund (FAF)<br>Small Grants Program of ICI<br>New funding initiatives (e.g. FT resilience fund)<br>InsuResilience Investment Fund<br>InsuResilience Solutions Fund<br>develoPPP.de program |
| | 4.2 Use of financial risk management approaches, incl. insurance | |
| 5. Integrate adaptation into Fair Trade standards in general | see left | Fairtrade Climate Standard by Fairtrade International |

Table 2: Overview of main action areas and support needs in importing countries and examples of existing support approaches.

### 4.2.1 Action area 1: Strengthen training on climate risks and adaptation options for importers

**Potential Support Approach 1.1: Facilitate learning and exchange**

The study has shown that actors in Fair Trade value chains have taken a variety of approaches to increasing climate resilience; however, it is not clear that these actors have fully taken advantage of the increasing body of knowledge about what works and what doesn't. German DC could help to enable a more systematic exchange on learning experiences.

- Fair Trade networks like the "Fairtrade's Producer Networks" and World Fair Trade Organization's (WFTO) networks provide adequate platforms for knowledge exchange on successful approaches amongst different partner countries and partner organisations. An example is the presentation of profiles of different producer organisations, which offer specific solutions to various challenges they face. Within this framework, best-practices and lessons learnt with respect to climate risk management along Fair Trade value chains could be shared.
- Another way to communicate experiences and innovations could be through cross-sectoral platforms, such as PANORAMA, which is supported through German DC. This partnership initiative documents and promotes best-practice examples and solutions across different topics of sustainable development with a view to enabling cross-sectoral learning and inspiration.
- The Climate Risk Planning & Managing Tool for Development Programmes in the Agriculture & Food Sector (CRISP) will be a working tool for agricultural and rural development planners and managers to identify climate risks and starting points for climate risk assessments and climate risk management.[38]
- The develoPPP.de program offers material about financial and technical support for businesses wishing to operate in developing countries.[39]

There is, therefore, no need to establish new platforms and mechanisms on knowledge exchange. Rather, existing ones could be strengthened to better reflect climate change adaptation experiences. The PANORAMA platform has incorporated climate change as part of its mandate. Much of the abundant, freely-accessible information is relevant for the smallholder sector and for Fair Trade products.

A joint initiative by German DC and existing Fair Trade or multi-sector networks could strengthen the exchange of success stories to increase climate resilience along Fair Trade value chains.

### 4.2.2 Action area 2: Reduce impacts on quantity and quality of products

**Potential Support Approach 2.1: Support climate risk management of Fair Trade producers**

*See chapter 3.2.2 as well as table 1 for examples of potential approaches that can support climate risk management of producers.*

### 4.2.3 Action area 3: Reduce impacts of cascading risks in importing countries

**Potential Support Approach 3.1**: Disclose climate risks of business portfolio

While there are approaches that support the assessment of climate risks at the farm-level such as the Climate Expert Tool (compare table 1), there are currently almost no applicable dedicated support approaches for analysing climate risks at a portfolio level.

With a view to the potential climate impacts in producing countries, there are selected risk analyses which offer information on climate impacts on the agricultural sector. On behalf of BMZ, the AGRICA project implemented by Potsdam Institute for Climate Impact Research (PIK) provides comprehensive climate risk analyses for selected partner countries in Sub-Saharan Africa, as well as compact climate risk profiles. For example, in Tanzania's climate risk profile, agriculture, infrastructure and water are listed among others as highly vulnerable sectors. Sector specific climate risk assessments indicate how yields may change under different climate change scenarios.[40]

**Potential Support Approaches 3.2 and 3.3:** Avoid loss of income, market share and shelf-space due to non-fulfilment of contracts with retailers (2.1), and avoid contractual penalties from retailers if contracted lots are not delivered

*For these two approaches, no examples are yet available to highlight best practices from German DC.*

38 The tool is in the planning and development phase and not yet available for applying.

39 Through develoPPP.de, BMZ offers financial and technical support for companies that want to do business or have already begun operating in developing and emerging-market countries. Under this program, the company has to take on at least half of the project costs, i.e. develoPPP.de offers matching funds for private investments.

40 The information can be supplemented by existing online data available (e.g. UNDP Climate Change Country Profiles).

**Potential Support Approach 2.4: Avoid loss of customers due to loss of shelf-space, e.g. by enhancing consumer awareness**

The survey in chapter 3 revealed that Fair Trade consumers have heightened awareness about GHG mitigation aspects of Fair Trade products (e.g. carbon footprint of products, packaging, transport etc.) but are mostly unaware of the impacts of climate change on producers, products and prices. Fair Trade civil society actors and retailers have an educational mandate according to the three main pillars of Fair Trade – trade, consumer education and political lobbying. German DC is already supporting that mandate. Climate change is a relatively new topic in this context. So far, it has not been taken up systematically by Fair Trade actors in their communication activities, and BMZ is not specifically requiring consumer education on climate change impacts by Fair Trade actors within their mandate. This knowledge transfer shortcoming is especially true regarding adaptation needs resulting from climate change. If customers were to understand the impacts of climate change on product quality and quantity, they might accept increased prices and variations in product quality.

Potential starting points to address this knowledge transfer shortcoming include:

- The website "#ichwillfair" (by INA) provides information for consumers on sustainable supply chains and Fair Trade organisations.
- Trainings and teaching materials for teachers, e.g. on sustainability in the cocoa sector provided by INA

The "#ichwillfair" website is a suitable starting point to create awareness on fair--trade systems for consumers in importing countries. Further trainings and teaching materials could be elaborated and conducted to expand the awareness. Climate change adaptation should be taken up as a standard topic for consumer education by Fair Trade actors (e.g. the Fair Trade Forum (Forum Fairer Handel e.V., FFH)) and initiatives (as already being done in the Fairtrade Fortnight, an annual campaign funded and organized by the Fairtrade Foundation focusing on the promotion of Fair Trade products). German DC could provide funding for these activities and / or link it with its own campaigning activities.

### 4.2.4 Action area 4: Provide access to finance and financial risk management approaches, including insurance for de-risking supply chain and products

**Potential Support Approach 4.1: Improved access to special funding for Fair Trade importers to support producers**

It is part of the partnership understanding and philosophy of Fair Trade importers to extend support to their producers, including supporting approaches for adapting to climate change and reducing climate risks. . They, in part, already provide funding for limited risk reduction measures (e.g. the construction of greenhouses for sapling propagation). Fair Trade importers have articulated needs to be able to provide funds for larger and more systematic adaptation measures. Dedicated support mechanisms for Fair Trade importers and organisations which in turn support their producers to reduce impacts on the quantity or quality of products could be explored further (see chapter 5, recommendation number 4).

**Potential Support Approach 4.2: Use of financial risk management approaches, including insurance**

One option to reduce risks for importers could be to develop new insurance products that pool climate risks. The importer could be insured against climate-related supply chain disruptions to processing or trading, which result in the contracted product's quantity or quality not being delivered by the producer due to impacts of extreme weather events and climate change (e.g. flood damage of warehouses or crop damage and failure).

Within the framework of the Global Shield against Climate Risks (GS) and the InsuResilience Global Partnership, innovative insurance solutions could be developed that strengthen financial resilience against climate risks along the value chain. The development of such products is far from being trivial since several problems have to be solved, e.g. the relationship of producer and importer-based insurances, the trigger for payments (e.g. index- based system as mentioned in chapter 4.1), and the use of payout amounts. From the insurance perspective, such combined products could be interesting, since the importer spreads the climate risk across different regions and products.

The InsuResilience Solutions Fund aims to develop new climate risk related insurance products and may partly cover development costs of such insurance products, however, the majority of these costs would likely have to be borne by the Fair Trade importers or the global insurance industry.

Meso-insurance[41] offered to importers could address the risk of contract fines that arise when the quality or quantity of goods cannot be delivered to supermarkets. Moreover, this insurance could indirectly benefit smallholders by increasing the resilience of the value chain and ensuring continued business relations.

The develoPPP program promotes private-sector entrepreneurial activities that further development goals. Companies that pursue sustainable activities in developing and emerging economies and invest in local communities can receive funding and technical expertise. An insurance could be developed that directly benefits importer companies in securing their value chain and indirectly benefits smallholders in producer countries.

### 4.2.5 Action area 5: Integrate adaptation into Fair Trade standards

The existing international standards related to Fair Trade principles and standards, as well as Fairtrade standards (see Box 1), already reflect climate change aspects to a certain extent:

- The *Fairtrade Climate Standard*, for example, which was developed in collaboration with the Gold Standard, is an internationally recognized organisation with expertise in climate and development projects. The *Fairtrade Climate Standard* is considered to be an add-on to the Gold Standard certification of carbon emissions reductions and sustainable development benefits. It can be used independently of Fairtrade certification and must not relate to agricultural supply chains. Fairtrade Carbon Credit projects enable producers to contribute to climate change mitigation.

Since adaptation to climate change becomes increasingly essential for many producers, the general Fairtrade standards could be further strengthened to promote adaptation.

41 Meso level index insurance covers “risk aggregators” such as banks, microfinance institutions, agribusinesses or national export companies

# 5. Recommendations for strengthening climate risk management in Fair Trade value chains

The previous chapter illustrates that many of the priority action areas overlap since the underlying risks either affect or can be addressed by both actors in producing or importing countries. This illustrates that climate resilience of Fair Trade value chains is to a certain extent a shared responsibility, yet the priority action areas and options differ between these actors. Certain adaptation measures, like adapting public infrastructure to the effects of climate change in producing countries, requires action by the public sector and others.

While there are examples of existing support approaches in German development cooperation for the priority action areas, many of them needed to be developed further or expanded to Fair Trade actors, especially taking the needs and capacities of small-scale producer organisations into account. Particularly support approaches for avoiding cascading effects for importers are not available.

Overall, the implementation of adaptation action is still insufficient. To strengthen climate risk management in Fair Trade value chains, Fair Trade actors and German development cooperation should consider further action on the following key recommendations:

1. **Provide training and learning opportunities on climate risks and adaptation options by expanding the offering of existing initiatives and platforms for Fair Trade actors**

2. **Strengthen the implementation of systematic climate risk management for Fair Trade producers.** Particularly the following activities should be considered or strengthened:
   a. Apply climate risk management at cooperative and farm-level;
   b. Enhance access to producer-oriented climate change information and climate services;
   c. Conduct climate risk assessments at cooperative and farm-level;
   d. Promote climate-resilient agricultural production at the farm-level, particularly for water management
   e. Reduce climate risks in processing

The analysis has shown that several support approaches already exist, particularly for improving climate-resilient agricultural production. These could be extended to Fair Trade producers and cooperatives.

3. **Improve access to finance for climate risk management activities and to financial risk management approaches, including insurance, for Fair Trade actors in producing and importing countries**
   While this study has listed examples of existing projects and funds that promote or provide access to finance for smallholders or enterprises, a more comprehensive as well as detailed overview (e.g. website) with information on existing offers in this area should be made available to Fair Trade networks and actors.
   Furthermore, existing support gaps and additional support options should be identified. Direct insurance to smallholders, for example, can offset production risks and improve smallholders' risk management strategies. Meso-insurance, for example a portfolio cover, can improve the resilience of producer organizations/cooperatives and ensure their economic viability, which could indirectly benefit smallholders as they rely on aggregators to facilitate access to farming inputs or credit (see CRIIZ Zambia). In principle, existing insurance schemes are already applicable to Fair Trade producers, but could also be tailored to specific challenges faced by Fair Trade actors. Also, innovative risk sharing options could be explored. For example, a German federal funding instrument, such as Export Credit Guarantees, offer protection against payment defaults while promoting access to risk-prone markets and facilitating export finance.[42] Such an instrument could also be developed to offer 'import guarantees' to cover financial losses incurred by importers due to climate-induced losses and product damages.

4. **Explore support options for Fair Trade importers, which strengthen their role as support and/or finance providers for producers with a view to reducing the impacts on the quantity or quality of products**
   The analysis has shown that the interviewed Fair Trade organisations have already implemented adaptation measures to address negative effects on the quantity or quality of products. These include approaches with potentially negative effects on the producers like the diversification

42 See www.exportkreditgarantien.de/en and Allianz Trade, formerly Hermes Cover: Euler Hermes und Allianz Trade (allianz-trade.de)

of trading partners and countries, or with potentially negative effects on the importing actor, such as changing the blending practices to substitute lower quality or delayed lots.
Some of the applied approaches with potentially negative effects for the importing Fair Trade organisation that may strengthen the resilience of producers or cooperatives include: the provision of grants to producers or producer organisations to protect production and/or processing against the impacts of weather and climate extremes, and/or to compensate for loss and damages. Importers may also choose, at their own risk, to pre-finance a product in order to facilitate liquidity for producers or to balance production losses with price mark-ups. Exploring and developing support options for importing Fair Trade organisations, which strengthen their role as support or finance providers could also help facilitate and improve access to financial support for producers or cooperatives.

5. **Strengthen the provision and access to climate risk information for Fair Trade value chains and actors**
As part of a comprehensive risk management approach, the use of climate change information, as well as climate services by producers and importers should be strengthened. This could entail classic climate service approaches for farmers, or it could include the development of climate risk assessments and profiles for whole value chains, trade portfolio partners, and selected commodity goods.

6. **Develop new risk sharing and management options for, and together with, actors along Fair Trade value chains**
Value chain actors depend on each other's success in managing climate and business risks. The cost of adapting to the impacts of climate change are, so far, not yet adequately reflected in product prices or risk sharing and management approaches of Fair Trade actors. The Fair Trade standard already frames and guides the business relationship of actors within Fair Trade value chains, and it should be explored to what extent additional Fair Trade-standards that could strengthen the risk sharing and management approaches of climate-related impacts can be implemented. Furthermore, it should be considered to what extent and how the risk sharing and investment costs for adaptation can be expanded to include conventional retailers and end customers, thereby buffering against cascading impacts in importing countries, which arise from a reduced quantity or quality of products.

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## Further Information


Adaptation Community: AGRICA Project: Working with science for a better understanding of climate risks. Adaptation Community: Climate Risk Assessment Management.

Adaptation Community: Climate Risk Assessment Method Search Engine (CRAMSE)

AGRICA: Country Climate Risk Profiles.

African Fine Coffee Asociation: Kagera Co-operative Union (KCU)

BIHOPHAR Honey: Official Website

BMZ: Initiative one world – no hunger

Breitsamer: Official Website

Climate Expert: Introduction to the Climate Expert tools. Working materials for the business community.

Coffee roastery Meyer Horn: Official Website

develoPPP: Offical Website

develoPPP: Agricultural technology company provides know-how transfer

develoPPP: Tea, coffee, spices: Organic producer committed to sustainable supply chains

EDUCE Mexiko: Offical Website

Equal Exchange Cooperation: Official Website

Fairtrade Access Fund: Official Website

Fairtrade International: Aims of the Fairtrade Standards

Fairtrade International: COVID-19 FAIRTRADE EMERGENCY INITIATIVE

Fairtrade International: Producer networks and producer organizations

Famille Michaud: Foundation Lune de MielFederacion de Cafeteros: En calidad de encargado, Camilo Galvis asume la Dirección Ejecutiva del Comité de Cafeteros de Cesar-Guajira

Fortnight Festival (Fairtrade International): Official Website

GEPA: Insight into Europe's biggest Fair Trade Company

GEPA: Partner Tea Promoters India

GFDRR & Worldbank: ThinkHazard!

GIZ: Global Initiative on Disaster Risk Management (GIDRM) II

GIZ: Global Programme on Strengthening Farmers' Organisations for Sustainable Agricultural Development

GIZ: Programme for sustainable agricultural supply chains and standards

GIZ: Project - Adaptation of agricultural value chains to climate change

GIZ: Project – Green Innovation Centres for the agriculture and food sector

GIZ: Project – Promotion of Agricultural Finance for Agri-based Enterprises in Rural Areas

GIZ: Project - SADC Adaptation to Climate Change in Rural Areas in southern Africa (ACCRA)

GIZ: Sector project on sustainable economic development

GIZ: Sustainable Agriculture (NAREN) Sector Project

Global Coffee Platform: Official Website

Global Initiative on Disaster Risk Management: Official Website

Initiative for coffee&climate (c&c): Official Website

Initiative for coffee&climate (c&c): Toolbox

Initiative for Sustainable Agricultural Supply Chains (INA): Official Website

InsuResilience Global Partnership: Official Website

InsuResilience Global Partnership: Global Index Insurance Facility GIIF

InsuResilience Solution Fund: Official Website

InsuResilience: Global Parametrics & One Acre Fund Provide Weather Protection for Tanzanian Farmers

InsuResilience: The World Bank Group's Global Index Insurance Facility in Zambia

International Climate Initiative: IKI small grants

International ValueLinks Association e.V.: Official Website

JGS Group Honey: Official Website

Kagera - Fair Trade coffee from Tanzania: Video

Partnership Initiative PANORAMA – Solutions for a Healthy Planet: Official Website

Sarant Ltd. Honey: Official Website Tanganyika Instant Coffee Company Limited (TANICA LTD): Official Website

Tea Promoters India: Official Website

The Latin American and Caribbean Network of Fairtrade Small Producers and Workers (CLAC): Official Website

Trade aid: Official Website

UNDP: Climate Change Country Profiles

Walter Lang Honey: Offical Website

Werkstatt Bremen: Official Website

# Annexes



## Annex 1: Documentation of the 3 analysed cases (TPI, KCU, EDUCE)

### Summary of the TPI case study[43]

The family-owned tea company "Tea Promoters India" (TPI) works throughout all tea-producing regions in India. Tea production is centralised in the nine tea gardens in Darjeeling, Assam, Kerala and Dooars. Each tea garden has its own nursery to produce tea saplings (two out of them in a greenhouse setting), its own input production (i.e. organic matter/compost) and its own processing plant covering steps from wilting to curing, depending on the type of the tea (e.g. green, Assam, Oolong, Earl Grey). Workers and members of the producer organisation manually care for tea bushes and members of the producer organisation, which are grown on slopes. Tea can be harvested all year round, through a harvesting process which involves plucking the top two leaves and the bud.

The harvested tea from all nine tea gardens is pooled in Siliguri, India, and taken from there to TPI's own packaging plant in Kolkata. Here, the tea is packed in bulk, fanning bulk or already for final sale depending on its destination and further processing. From the packaging plant the tea continues to the harbour in Kolkata. All distances are covered by truck.

Main inputs used in India are:
- Coal to fire the tea (processing)
- Polyethene and metal for greenhouses
- Packaging material made from elephant dung, wood pulp and some cotton leftovers from a local textile factory
- Construction material (for offices and packaging plant)
- Fuel for transport

Up to the harbour in Kolkata, the value chain always looks the same, no matter the destination or packaging status of the tea:[44]

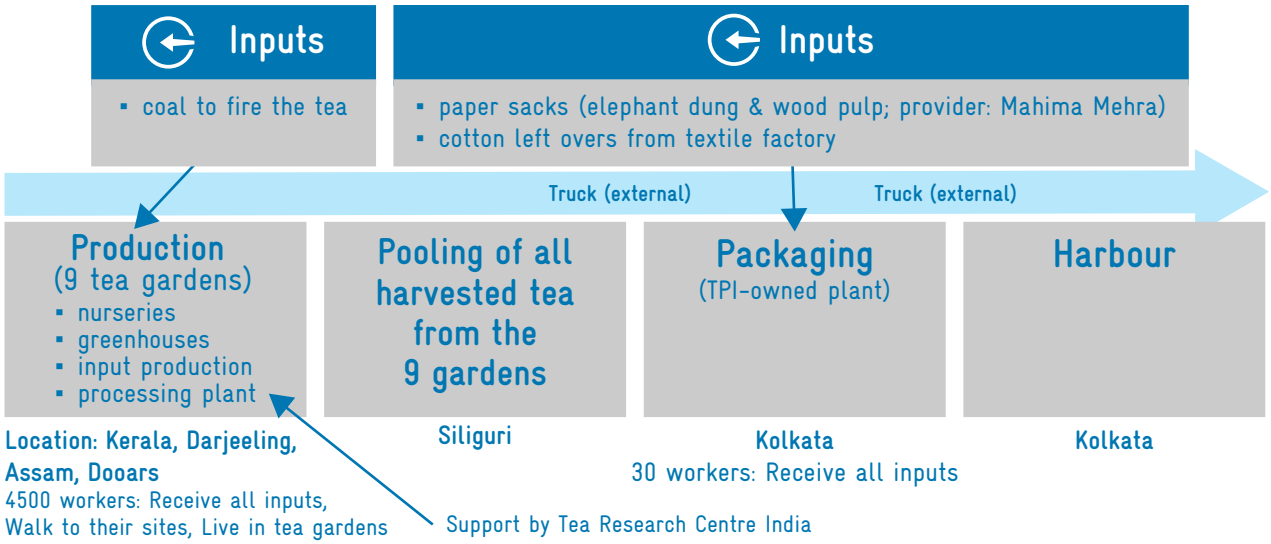


Figure 9: Value chain TPI up to export harbour.

43 Based on inputs by TPI, Martinshof, OFC, GEPA and all their websites
44 Inputs such as machinery for processing or fuel for transport not included

From there onwards, the tea belongs to GEPA (or other buyers respectively) and there are three different options for the tea to continue, depending on the type of tea (bulk, fanning bulk, packed tea).

Most of the tea (bulk tea as well as fanning bulk) is shipped to Bremen. From the harbour the tea is stored until further transport by the Berthold Vollers Group in Bremen or transported directly in sacks to the Bremen-based Martinshof, where it is packed into sellable units with all relevant specifications on pack. Martinshof receives packaging material from the Indian company Mahima Mehra, which is the same provider for packaging material as for TPI. From there the tea continues by truck to GEPA[45] in Wuppertal. Some of it stays there for sale, some of it is transported directly to retailers (e.g. World Shops or conventional retailers) and some of it is transported to the distribution centres[46], and then to retailers.

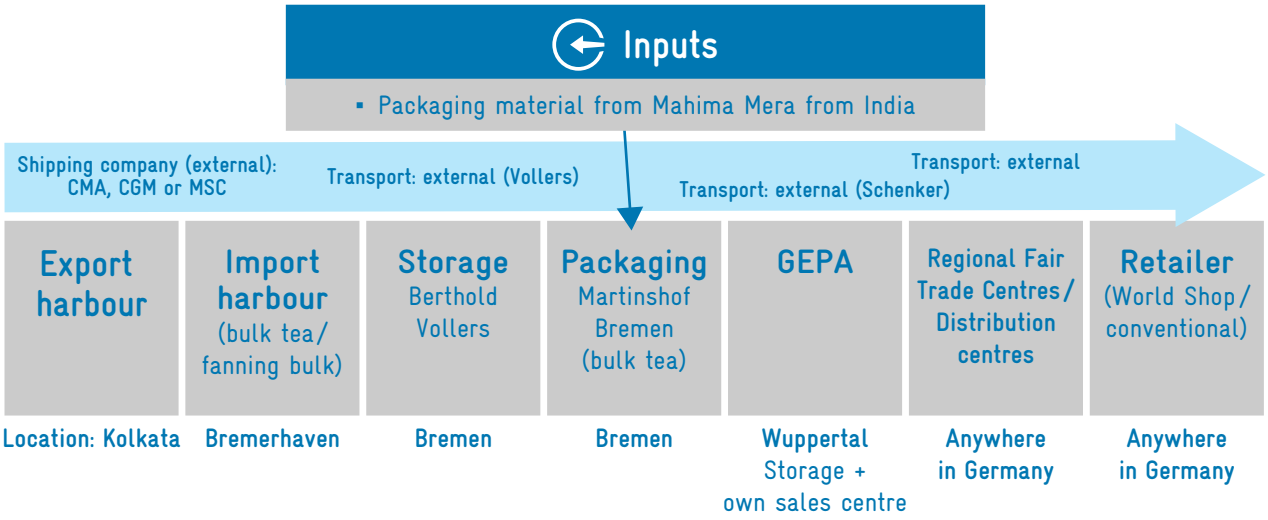


Figure 10: Value chain TPI for bulk tea.

Fanning bulk is transported from Bremen to Veenendaal in the Netherlands. Here the Organic Flavour Company (OFC) further mixes the tea, e.g. with spices, and then packs it into tea bags. Same as for bulk tea, the tea then continues by truck to GEPA in Wuppertal. Some of it stays there for sale, some of it is transported from there to retailers (e.g. World Shops or conventional retailers) and some of it is transported to fFair Trade centres or distribution centres before arriving at the retailers.

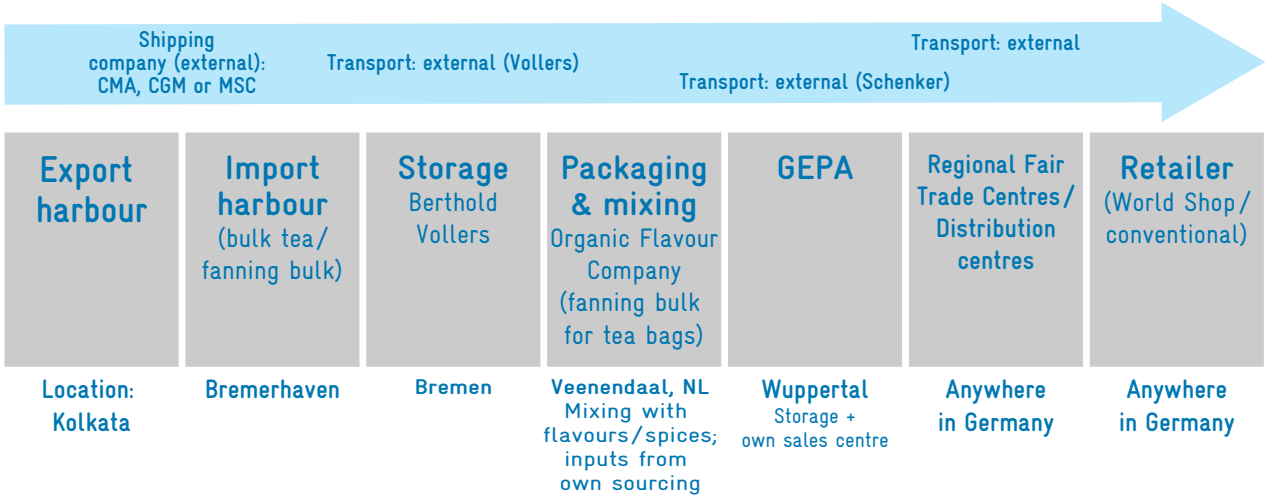


Figure 11: Value chain TPI for fanning bulk.

45 The same location includes GEPA head offices, storage facilities for products and a sales center; products arrive at the storage facilities.
46 Purpose of the regional Fair Tradecenters and distribution centers is to offer clients (retailers) the chance of viewing the products before purchase, which was indicated as especially relevant in the case of handcrafts.

Packed tea, i.e. packed for final sale by TPI in Kolkata, is shipped to Rotterdam and from there usually transported via inland waterways and truck. The logistics company may reload the tea in Neuss or Duisburg, for further transport.[47]

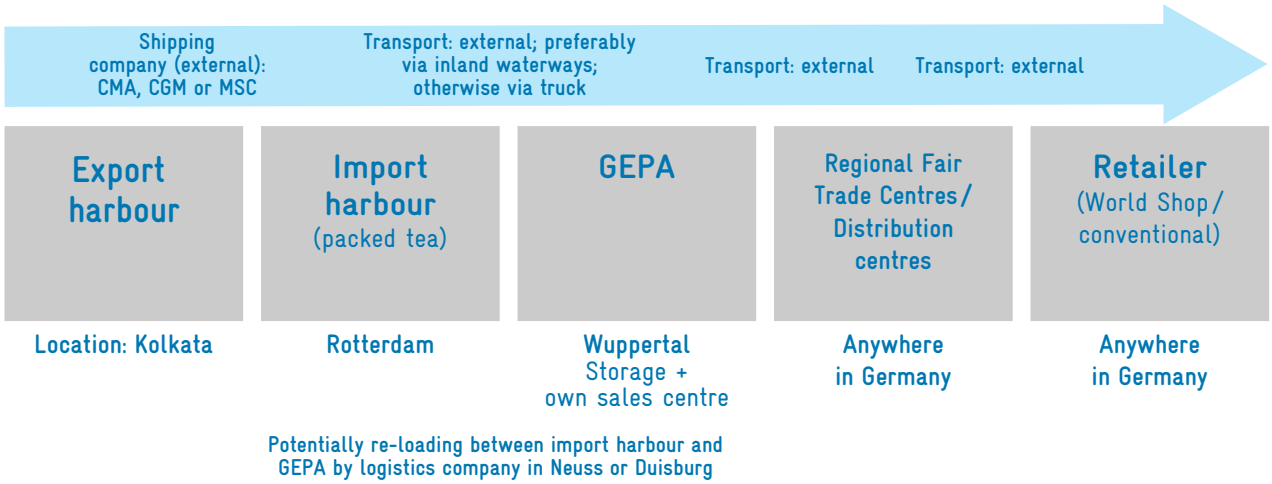


Figure 12: Value chain TPI for packed tea.

Packed tea is imported to a minor extent[48], as transporting air and packaging material is costly.

| Summary of the TPI value chain analysis | |
|---|---|
| **Producer organisation** | Tea Promoters India (TPI)<br>▪ Tea company, family owned in third generation<br>▪ Collaboration with GEPA since 1990<br>▪ 9 tea gardens across all Indian tea growing regions<br>▪ Approximately 4,500 members |
| **Website** | https://www.teapromoters.com<br>https://www.gepa.de/produzenten/partner/tpi.html |
| **Location** | ▪ Company headquarters in Kolkata<br>▪ Tea gardens in Darjeeling, Assam, Kerala and Dooars |
| **Certifications** | ▪ Fairtrade<br>▪ USDA organic<br>▪ Demeter<br>▪ Naturland<br>▪ BioSuisse (organic)<br>▪ EU Bio |
| **Sales** | ▪ 35–40 % sold as Fairtrade + organic<br>▪ 20 % sold as conventional<br>▪ Rest (45–40 %) sold as organic |
| **Trading partners** | Among others:<br>▪ GEPA (for 30 years)<br>▪ Equal Exchange (US: https://equalexchange.coop/)<br>▪ Trade aid (New Zealand: https://www.tradeaid.org.nz) |
| **Perceived climate change hazards** | ▪ Increased climate variability (less predictability of seasons)<br>▪ More rainfall in less time<br>▪ Drier and longer winters<br>▪ Strong Monsoon rains: heavy rains and flooding |

47 GEPA contracts transport from Rotterdam to Wuppertal preferable via inland waterways, the logistics company decides on the final route.
48 In 2018, 9 % of total tea purchased from TPI were packed tea, the rest bulk or fanning bulk. (Source: GEPA)

| | |
|---|---|
| **Impacts of these hazards** | ▪ Soil erosion<br>▪ Loss of topsoil<br>▪ Drying up of tea bushes<br>▪ Loss of tea gardens due to flooding in Kerala in 2018<br>▪ Loss in yield quality and quantity |
| **Responses** | ▪ Planting of soil binders to hold the slopes<br>▪ Mulching in winter (November) to capture soil moisture<br>▪ Asking GEPA for help: in 2018 GEPA provided funding to build a greenhouse for crop production other than tea to make up for income losses of farmers due to the flooding<br>▪ Extra activities come at an extra cost; TPI bears these costs with own funds (margins or surplus; non Fair Trade related) |
| **Other institutions to collaborate regarding climate change** | Tea Research Institute of India: they offer trainings, e.g. on tea varieties and spacing; no official collaboration established |

## Summary of the EDUCE case study[49]

EDUCE's honey is produced by small-holder apiculturists on Mexico's Yucatan peninsula. The indigenous Mayan producers hardly use any inputs. They mostly build their wooden beehives themselves and do not use any chemicals against pests or diseases.

The organization owns a homogenizer and sends all its honey in bulk in 300 kg barrels to the harbour in Veracruz for international shipping. The honey thus has to travel roughly 1000 km from Yucatan by truck to reach the harbour. Upon arrival in Hamburg or Bremerhaven, the barrels are loaded into trucks again for transport to the re-packaging agent, for example[50], Dreyer Bienenhonig in Uelzen. The service provider fills the honey from barrels into glasses and labels them accordingly. Packaging material is sourced by the company. From there the honey leaves, again by truck, to GEPA in Wuppertal and from there on to the final point of sale. In some cases,[51] the honey is transported directly from Dreyer to the final point of sale.

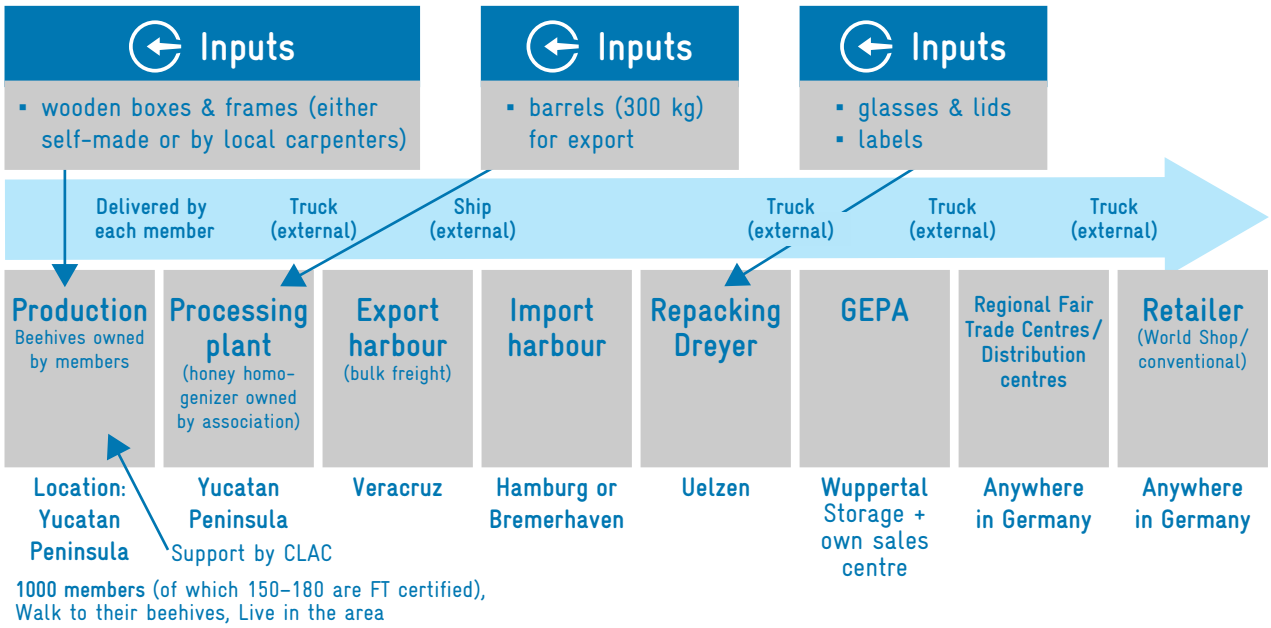


Figure 13: Value chain of EDUCE. [52]

49 Based on inputs by EDUCE, their website and GEPA
50 Others that receive EDUCE's honey are Breitsamer & Ulrich GmbH or Walter Lang
51 E.g. private label goods or in cases where clients purchase in barrels
52 Inputs such as machinery for processing or fuel for transport not included

| Summary of the EDUCE value chain analysis | |
|---|---|
| **Producer organization** | Export organization EDUCE (Educación, Cultura y Ecología)<br>▪ Founded in 1989, first honey exports in 1994<br>▪ 1995 first Fairtrade certified honey exported<br>▪ Active in the Mexican states of Campeche, Yucatán and Quintana Roo<br>▪ Holistic approach to support especially the Mayan communities while integrating their traditional knowledge and customs<br>▪ Approx. 1000 members<br>▪ Buying honey from the Yucatan peninsula since 1997 for export à commercializing some honey from non-members |
| **Website** | https://www.narimpex.ch/en/about-narimpex/sustainability/educe-mexico-1 |
| **Location** | Mérida, Yucatán, Mexico |
| **Certifications** | ▪ Fairtrade<br>▪ Organic (national certification SAGARPA)<br>▪ EU Bio (Certimex)<br>▪ Naturland<br>*Note: Out of the 1000 members 150–180 are enrolled and certified under Fairtrade; the market is limited, and certification is costly, certifying more would not pay off. GEPA sources honey from three different cooperatives via EDUCE.* |
| **Sales** | ▪ 700–1000 tons sold annually<br>▪ 90 % sold as organic including approx. 25 % sold as Fairtrade + organic<br>▪ Rest sold as conventional |
| **Trading partners** | ▪ GEPA since 1995<br>▪ J.G. Schütte GmbH & Co. KG in Bremen (https://www.jgs.de)<br>▪ Bihophar (Dr. med. Hans Plümer Nachf. GmbH & Co. KG; https://www.bihophar.de)<br>▪ The French Famille Michaud (http://www.famillemichaud.com)<br>▪ The British Sarant Ltd. (http://www.sarant.co.uk) |
| **Perceived climate change hazards** | ▪ Changes in micro-climates: temperatures, humidity levels, rainfalls |
| **Impacts of these hazards** | ▪ Changes in floral cycles and flower phenology<br>▪ Now: favourable conditions for the mite Varroa destructor feeding on the bee brood<br>▪ Feedstock for bees affected<br>▪ Physical condition and health of beehives negatively affected<br>▪ Elimination of beehives |
| **Responses** | ▪ Reforestation, especially with melliferous (honey-producing) flora<br>▪ Provision of food for bees to maintain adequate population during flowering season<br>▪ Moving beehives to areas where blooming is ongoing (this bares the risk of entering regions with genetically modified organisms, which a) endangers the health of the bees and b) is not allowed under the organization's certifications)<br>▪ Own (though little) savings to cater for emergencies |
| **Other institutions to collaborate regarding climate change** | Fairtrade Producer Network Latin America (CLAC: http://clac-comerciojusto.org) |

## Summary of the KCU case study

The 60,000 smallholder farmers under KCU produce Robusta and Arabica coffee. On average, each farmer counts on 1.65 hectares of coffee. All of the producers are Fairtrade certified, and about 12,500 are also certified as organic. Another 5,000 farmers are currently in the process of obtaining organic certification.[53] The inputs the farmers use in their fields include seeds, seedlings, agrochemicals (pesticides and fertilizers) and bags to transport the harvested coffee. All coffee (Robusta and Arabica) is dried either by the individual producer or at the cooperative level and then hulled at KCU's own dry mill. 2 % of total exports are processed to instant coffee. KCU owns the majority of the Tanganyika Instant Coffee Public Limited company (TANICA) that produces and packs instant coffee.

The individual producers deliver their coffee to the cooperatives on foot, by bike or motorbike. From there, the coffee is transported by truck to KCU's central storage or to TANICA. From the central storage or TANICA, the coffee leaves by truck to the export harbour (Tanga or Dar-es-Salaam) and, in the case of GEPA, is shipped to Bremerhaven. From the import harbour it goes by truck to the roaster. In the case of GEPA coffee, GEPA contracts the roasting as a service-provider; the coffee, at all times, belongs to GEPA. The roaster, e.g. Niehoffs Rösterei or Meyer & Horn, sources paper packaging that fits into the machines. The coffee package and the stickers with product information are provided by GEPA. Afterwards, the final product is transported by truck to GEPA and then on to the distribution centres or directly to the retailers.

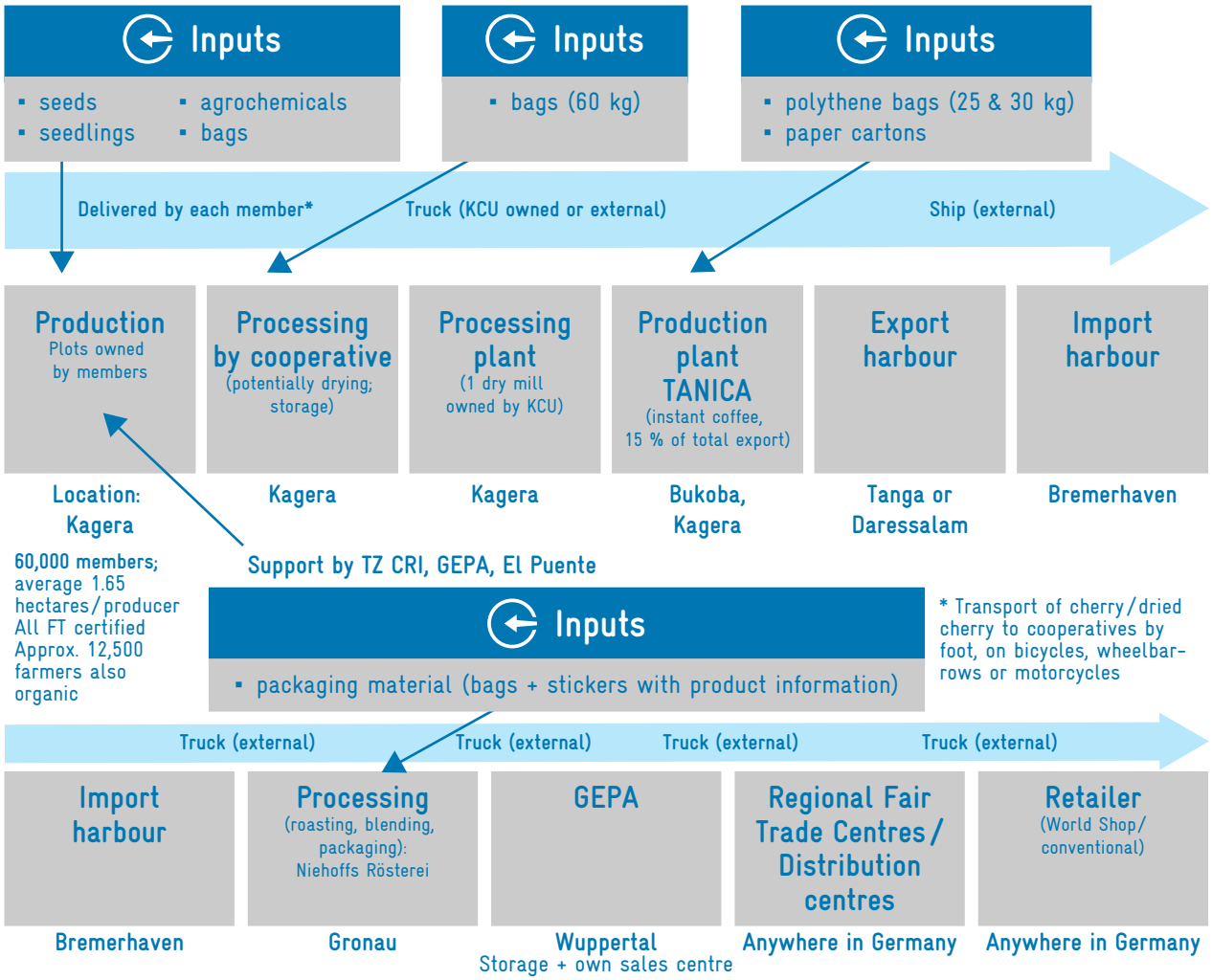


Figure 14: Value chain of Kagera Cooperative Union (KCU). [54]

53 Organic certification is considered to lead to more resilient production plots in the face of climate change; see, e.g., IFOAM: The CONTRIBUTION of ORGANIC AGRICULTURE to CLIMATE CHANGE ADAPTATION in AFRICA

54 Inputs such as machinery for processing or fuel for transport not included

| Summary of the KCU value chain analysis | |
|---|---|
| **Producer organization** | Kagera Cooperative Union (KCU) Limited<br>▪ Founded in 1950<br>▪ Umbrella organization of 125 cooperatives; approx. 60,000 small-scale coffee farmers<br>▪ 80 % Robusta, 20 % Arabica<br>▪ 25 cooperatives certified as organic + 10 in the process (conversion to organic supported by Fair Trade actors)<br>▪ Production of instant coffee<br>▪ KCU owns majority share of processing unit (TANICA) |
| **Website** | ▪ https://afca.coffee/portfolio-item/kagera-co-operative-union-kcu/<br>▪ https://www.gepa.de/produzenten/partner/kcu-kagera-cooperative-union.html<br>▪ Introductory video clip: https://www.youtube.com/watch?v=LLCT_zPRrGI |
| **Location** | Bukoba, Tanzania |
| **Certifications** | ▪ Fairtrade (since 1990)<br>▪ Organic (since 1999; IMO / Ecocert)<br>▪ Hand-in-Hand (by Rapunzel)<br>▪ 4C<br>▪ (Formally: UTZ, but this was dropped due to lack of market)<br>▪ *Note: The whole production is certified under Fairtrade and 4C* |
| **Sales** | ▪ Between 4,000 tons (in a bad year) and 8,000 tons (in a good year) of green coffee annually<br>▪ Approx. 35 % sold as Fairtrade + organic<br>▪ Approx. 35 % sold as Hand-in-Hand<br>▪ Rest sold into conventional market |
| **Trading partners** | ▪ 90 % goes to the EU and 70 % to Germany<br>▪ GEPA since 1993<br>▪ Rapunzel<br>▪ El Puente<br>▪ Twin Trading (UK)<br>▪ Oxfam Belgium<br>▪ InterAmerican Coffee (Neumann Group; conventional + certified lines)<br>▪ Bennecke Coffee (conventional + certified lines) |
| **Perceived climate change hazards** | ▪ Seasons are not that distinct anymore<br>▪ Sunny periods during rainy seasons<br>▪ Dry spells |
| **Impacts of these hazards** | ▪ Drying up of natural springs à lack of water (for production and household use)<br>▪ Limited flowering, flowering spread over a longer period à less production<br>▪ Maturing of fruits hindered, prolonged à improper fruit development à decrease in cup quality and quantity (weightless beans)<br>▪ Increase in incidents of pests and diseases: stem borers, black ants, leaf rust, sometimes Coffee Berry Disease à increased need for chemical application à increase in production costs<br>▪ Coffee drying becomes more difficult à loss in quality and quantity<br>▪ Coffee cycle is mixed up |
| **Responses** | ▪ Partly renewal of old plants with drought tolerant and disease resistant coffee varieties from the Tanzanian Coffee Research Institute<br>▪ Application of agrochemicals<br>▪ Trialling organic production, including shade trees, erosion control and mulching<br>▪ Supplying subsidized energy-saving stoves to members (project supported by GEPA and El Puente) to reduce deforestation among other benefits |
| **Other institutions to collaborate regarding climate change** | ▪ Tanzanian Coffee Research Institute<br>▪ GEPA<br>▪ El Puente |

## Annex 2: List of interview participant groups

| Participant group | Description of participant group | Number of interviews/actors | |
|---|---|---|---|
| **Fair Trade Producers** | Producer organizations certified under a Fair Trade standard and selling (parts) of their produce into Fair Trade markets | 3 interviews; 3 actors | Tea Promoters India<br>Kagera Cooperative Union<br>EDUCE |
| **Fair Trade Civil Society** | Civil society organizations such as standard setters / owners or umbrella organizations in the fair-trade segment | 7 interviews; 6 actors | Fairtrade International<br>Fairtrade Germany<br>Fairtrade Producer Network Latin America<br>Naturland e.V.<br>Forum Fairer Handel e.V.<br>Weltladen Dachverband e.V. |
| **Fair Trade Importers** | Private companies importing 100 % Fair Trade products with long-term partnerships with their suppliers | 3 interviews; 3 actors | GEPA- The Fair Trade Company<br>El Puente<br>Weltpartner e.G. |
| **Fair Trade Service Providers** | Private companies contracted by fair-trade Importers for a particular processing step, e.g. coffee roasting, tea mixing or packing, chocolate manufacturing; in many cases these companies do not have a portfolio 100 % based on Fair Trade products, but have a strong preference for sustainable products; within fair-trade value chains looked at they may play a role as service provider, though in other contexts they may be Fair Trade importers themselves (though not necessarily with 100 % of their own portfolio) | 4 interviews + 1 E-Mail survey, 5 actors | Niehoff's Kaffeerösterei<br>Organic Flavour Company B.V.<br>Martinshof Werkstatt Bremen<br>Ludwig Weinrich Schokolade<br>Max Meyer & Max Horn Kaffeerösterei (E-Mail communication only) |
| **Conventional Chain Actors** | Companies (e.g. traders or roasters) with some Fair Trade lines within their portfolio, though a majority of non-Fair Trade product lines conducting their own sourcing | 2 interviews; 2 actors | Hamburg Coffee Company HACOFCO (trader)<br>Tchibo GmbH |
| **Fair Trade Retailers** | Retailers with 100 % of their portfolio being Fair Trade | 1 interview; 1 actor | Weltladen Bremen (personal interview) |
| **Conventional Retailers** | Retailers with a mixed portfolio | 0 interviews[55] | |

55 In the case of Conventional Retailers, there was no answer to the request for an interview despite several attempts, thus participation of these actors in the interview series is zero.

## Annex 3: Overview of perceived hazards, impacts on production and responses by TPI, EDUCE and KCU

| | Perceived hazards | Impacts on production | Responses |
|---|---|---|---|
| **TPI**[56] | ▪ Excess rains<br>▪ Heavy rains<br>▪ Strong Monsoon rains à Flooding<br>▪ Longer[57] and drier winters | ▪ Soil erosion<br>▪ Loss of tea bushes or even entire tea gardens (in 2018 parts of the tea garden in Kerala were flooded, damaging production as well as the processing unit)<br>▪ Production losses of estimated 20 % (quality and quantity) over the past five years across all production regions | ▪ **Planting of soil binders to hold the slopes**<br>▪ **Mulching in winter (November) to capture soil moisture**<br>▪ Asking GEPA for help: in 2018 GEPA provided funding to build a greenhouse for tea saplings to replant tea areas affected by the flooding<br><br>à Extra activities come at an extra cost; TPI bares these costs with own funds (margins or surplus; non-Fair Trade related) |
| **EDUCE**[58] | ▪ Changes in micro-climates<br>▪ Changes in temperatures<br>▪ Changes in humidity levels<br>▪ Changes in rainfalls | ▪ Changes in floral cycles and flower phenology<br>▪ Now: favourable conditions for the mite Varroa destructor feeding on the bee brood<br>▪ à Feedstock for bees affected<br>▪ Physical condition and health of beehives negatively affected<br>▪ Elimination of beehives | ▪ Reforestation, especially with melliferous (honey-producing) flora<br>▪ Provision of food for bees to maintain adequate population during flowering season<br>▪ Moving beehives to areas where blooming is ongoing (this bares the risk of entering regions with genetically modified organisms, which a) endangers the health of the bees and b) is not allowed under the organisation's certifications)<br>▪ Own (though little) savings to cater for emergencies |
| KCU[59] | ▪ Irregular rainy seasons (e.g. shortened, prolonged or continuous rains)<br>▪ Sunny periods (i.e. lack of rains) during rainy seasons<br>▪ Dry spells | ▪ Limited flowering and flowering spread over a longer period à less production<br>▪ Maturing of fruits hindered or prolonged à improper fruit development à decrease in cup quality and quantity (weightless beans)<br>▪ Increase in incidents of pests and diseases: stem borers, black ants, leaf rust, sometimes Coffee Berry Disease<br>▪ increased need for chemical application<br>▪ increase in production costs<br>▪ Coffee drying more difficult due to unpredictable and prolonged rains (coffee is usually sun-dried) rains during the respective times lead to loss in quality and quantity (see chapter 1.2.2)<br>▪ Mixed up coffee cycle<br>▪ less predictability and thus less programmability of field work[60] | ▪ Partly renewal of old plants with drought tolerant and disease resistant coffee varieties from the Tanzanian Coffee Research Institute<br>▪ Application of organic fertilizers and pesticides (application of respective inputs allowed under the given standard requirements)<br>▪ Implementation of organic production, including shade trees, erosion control and mulching<br>▪ Supplying subsidized energy-saving stoves to members (project supported by GEPA and El Puente) to reduce deforestation among other benefits |

56 All quantitative indications based on inputs by TPI, narrative based on KII with all value chain actors
57 No indication on how much longer
58 Based on KII with all value chain actors
59 Based on KII with all value chain actors
60 For example, if before a more or less uniform ripening took place the harvesting period was clearly defined; now changes in rains lead to changes in fruit development and ripening and shift/ prolong harvesting times; this leads to an increased work load and a longer harvesting period translating into higher production costs

## Annex 4: Glossary[61]

**Exposure**: The presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected.

**Extreme weather event**: An extreme weather event is an event that is rare at a particular place and time of year. Definitions of rare vary, but an extreme weather event would normally be as rare as or rarer than the 10th or 90th percentile of a probability density function estimated from observations. By definition, the characteristics of what is called extreme weather may vary from place to place in an absolute sense. When a pattern of extreme weather persists for some time, such as a season, it may ^cdsdsdcdsbe classed as an extreme climate event, especially if it yields an average or total that is itself extreme (e.g., drought or heavy rainfall over a season).

**Hazard**: The potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources. In this report, the term hazard usually refers to climate-related physical events or trends or their physical impacts.

**Risks**: Risk of climate-related impacts results from the interaction of climate-related hazards (including hazardous events and trends) with the vulnerability and exposure of human and natural systems, including their ability to adapt. Rising rates and magnitudes of warming and other changes in the climate system, accompanied by ocean acidification, increase the risk of severe, pervasive and in some cases irreversible detrimental impacts.

**Value chain**: According to M. Porter (1985) a value chain includes any actor delivering inputs or services or handling the product. This includes, e.g., fertilizer providers, supporting organizations (private, civil society or governmental), harvesters or packers as well as producers, traders, manufacturers and retailers. In contrast, a supply chain includes solely actors handling the product.

**Vulnerability**: The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt.

61 The definitions are mainly referring to the AR5 IPCCC Glossary

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