Fairtrade climate action:

reducing greenhouse gas emissions in sugar supply chains

Cover photo: Ana Zoila Coto Guillen, a member of the El Sunza cooperative in El Salvador.
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Fairtrade sugar is one of the top five most important Fairtrade products worldwide. Fairtrade certification is only open to organised Small Producer Organisations (SPOs).

Key data (2021 figures)

Fairtrade certified sugar is produced in 18 countries across four continents.

49,709 farmers produce Fairtrade sugar, organised in 82 SPOs.

More than 550,000 tonnes of Fairtrade certified sugar produced annually.

More than 100,000 ha total area under Fairtrade sugar cultivation.

When sugar is sold on Fairtrade terms, SPOs receive a Fairtrade Premium of US$60 / tonne for non-organic and US$80 / tonne for organic sugar.

Introduction

The sugarcane sector is associated with social and economic challenges, which Fairtrade producers address with support and training on Fairtrade Standards from the Fairtrade producer networks (PNs). In addition, Fairtrade runs specific interventions and programmes to help co-ops maintain the best labour, climate and environmental practices by understanding and reducing their greenhouse gas (GHG) emissions. Sales of Fairtrade sugar fund the two main global sugar programmes, Better Labour Practices in high-risk countries and Climate Resilient Cane Production.

Fairtrade sugarcane producers are among the communities most affected by climate change. Challenges include extreme weather events such as more frequent and intense tropical storms, which devastate cane fields and infrastructure, as well as floods, unseasonal rains and droughts. Most Fairtrade sugarcane is produced in small African, Caribbean and Pacific (ACP) countries, several of which are small island developing states (SIDS), where sugar production is socially and economically significant both as a major source of employment and a driver of local economies. The relationship between climate change and agriculture is key to understanding the social, economic and ecological contexts in which Fairtrade producers operate. Being part of Fairtrade allows farmers to be more resilient to an adverse and unpredictable climate.

Sunghutter Toonarain, a member of the Fairtrade certified Century Co-operative Credit Society (CCS) in Mauritius.
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Carbon and Water (C & W) Footprint studies

Fairtrade and key supply chain partners agreed to undertake C&W Footprint studies in selected sugarcane producing countries. Seven studies have been completed in Belize, Costa Rica, El Salvador, Eswatini, Fiji, India* and Mauritius. With the exception of the Indian study, carried out by consultant Luca Desideri, all other studies were carried out by the consultancy company Soil & More Impacts (now part of sustainable).

C&W footprint studies assess GHG emissions and water use. This helps Fairtrade understand, design and build collaborative climate actions and follow-up projects to improve resilience to climate disasters. Over the past two years, Fairtrade International has commissioned seven such studies to assess the C&W footprints of key Fairtrade cane sugar origins.

* *The Indian study evaluated SPOs but not supply chains*

SCOPE OF THE STUDIES

These studies do not analyse the entire life-cycle of cane sugar from field to consumption. Some measured GHG emissions and water use only at agricultural level (i.e. on the farm), while others included processing at the mill or factory; up to the point of export; or up to the point of import (into Europe, the USA and other destinations). The C&W Footprint further down the supply chain to 'end of life', or consumption, was not measured. Thus, 'negative balance of emissions' applies only up to the point of export.
With the exception of Mauritius and India, the studies were carried out during the Covid-19 pandemic, so consultants were unable to travel to countries of origin. Comparisons of outcomes between origins were not envisaged, and are difficult because of the different indicators and sample sizes used.

During the course of the studies, some Fairtrade sugar supply chains and origins experienced severe droughts, floods and tropical storms.

The consultants used the Cool Farm Tool to calculate carbon emissions. For the studies by sustainable, it was adapted from maize to sugarcane to estimate the farm influence of the data collected.

AIMS OF THE STUDIES

Given the European Union (EU) proposals to introduce Human Rights and Environmental Due Diligence (HREDD) regulations, the studies also give both producers and buyers insights into current environmental impacts and potential risks.

Global markets show a growing appetite for carbon emission reduction. Buyers are setting science-based targets, resulting in an expectation and willingness to support climate action in food supply chains. The studies are therefore a chance for supply chain partners worldwide to collaborate to increase Fairtrade sugar sourcing and sales, co-invest in measures to reduce GHG emissions and increase producers' resilience to climate change.

Projects to lower emissions support producer resilience in many different ways. At producer level they aim to improve sustainable agriculture, reduce the costs of production and inputs, and increase productivity. The studies also help Fairtrade assess how sugar producers contribute to, and are affected by, climate change - and how best to support their efforts towards greener farming practices in agricultural supply chains.

Finally, the C & W studies will inform a forthcoming review of the Fairtrade Cane Sugar Standard and will help producers prioritise their Fairtrade Premium investments - for example by increasing their capacity to resist and recover from climate shocks and by mitigating their contribution to climate change.

Positive characteristics and plant efficiency of sugarcane

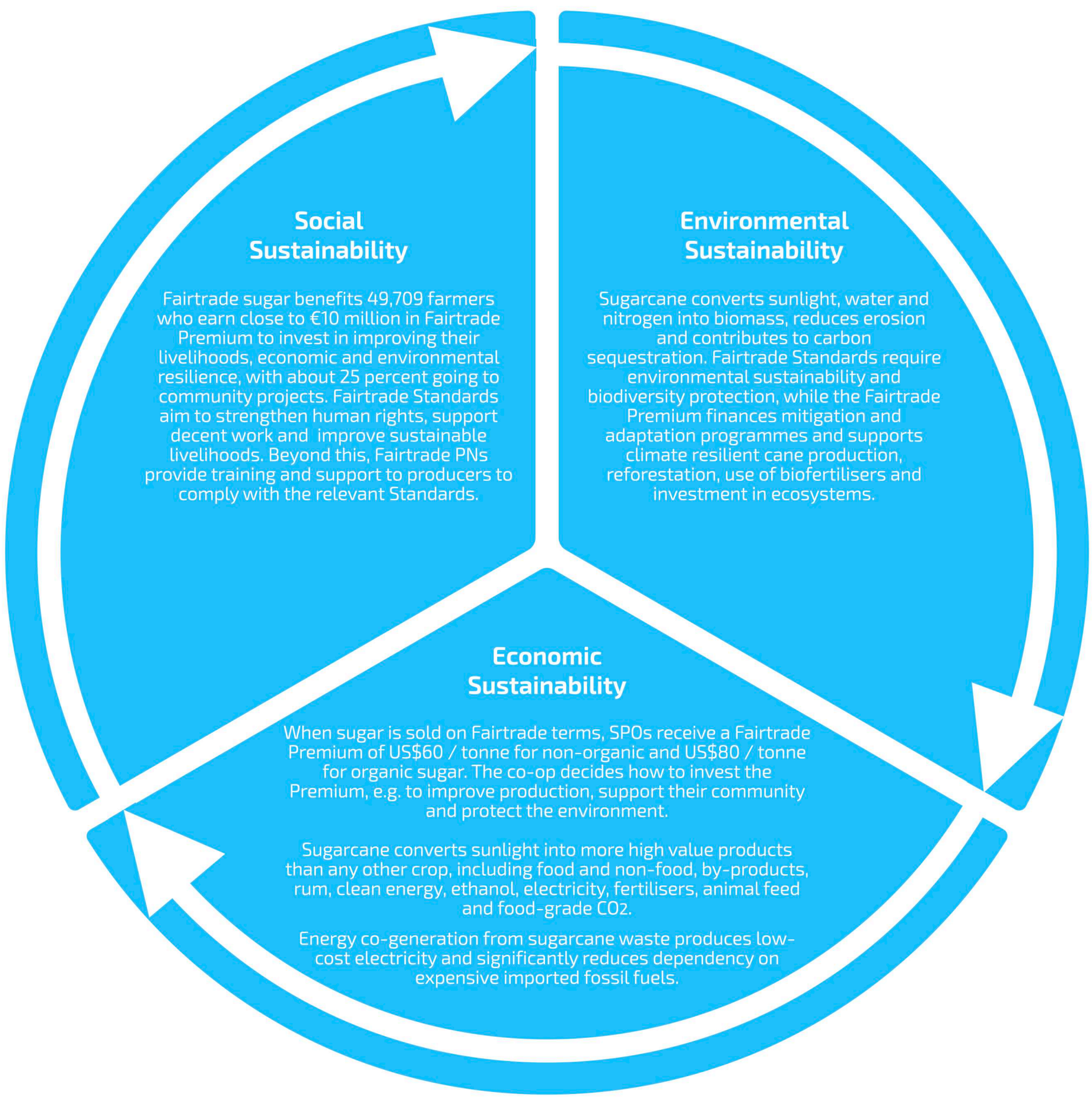
Fairtrade and Fairtrade sugarcane producers work hand in hand to fight climate change and to produce sugarcane using resilient farming methods with minimal emissions.

Sugarcane is a 'model' climate change crop. It has exceptional capacity to capture CO2 and convert it into biomass; is highly efficient in water and nutrient use; and it adapts better to climate change. It is classified as a C4 crop, with high radiation, nitrogen, and water use efficiencies (for more details see here and here).

Sugarcane is not just a source of sugar. It is used in food and non-food manufacturing, and to produce alcoholic drinks and ethanol. Bagasse (cane fibre) and dry trash are frequently used as a biofuel to power sugar mills and to produce electricity. The C & W footprint studies suggest that in cane sugar production up to the point of export, emissions avoided can be higher than emissions generated. Furthermore, Fairtrade cane sugar production has the potential for a low climate impact because smallholder farmers use very few machines, and tend to be efficient at managing crop residues and other farm resources.

C & W footprint studies of Fairtrade sugarcane co-ops and the industry in Mauritius, Belize, Eswatini and India show that an holistic approach to sugar production at farm and factory level can help negate the balance of carbon emissions in the production cycle, especially if renewable energy is used to replace that generated from fossil fuels.

Fairtrade certified cane sugar, produced according to the Fairtrade Standards, perfectly encompasses the three dimensions of sustainability: economic, social and environmental.



Positive outcomes of sugarcane

Perennial crops are in the spotlight for their potential to mitigate climate change. As a perennial grass, sugarcane only needs to be replanted once the crop becomes unproductive.

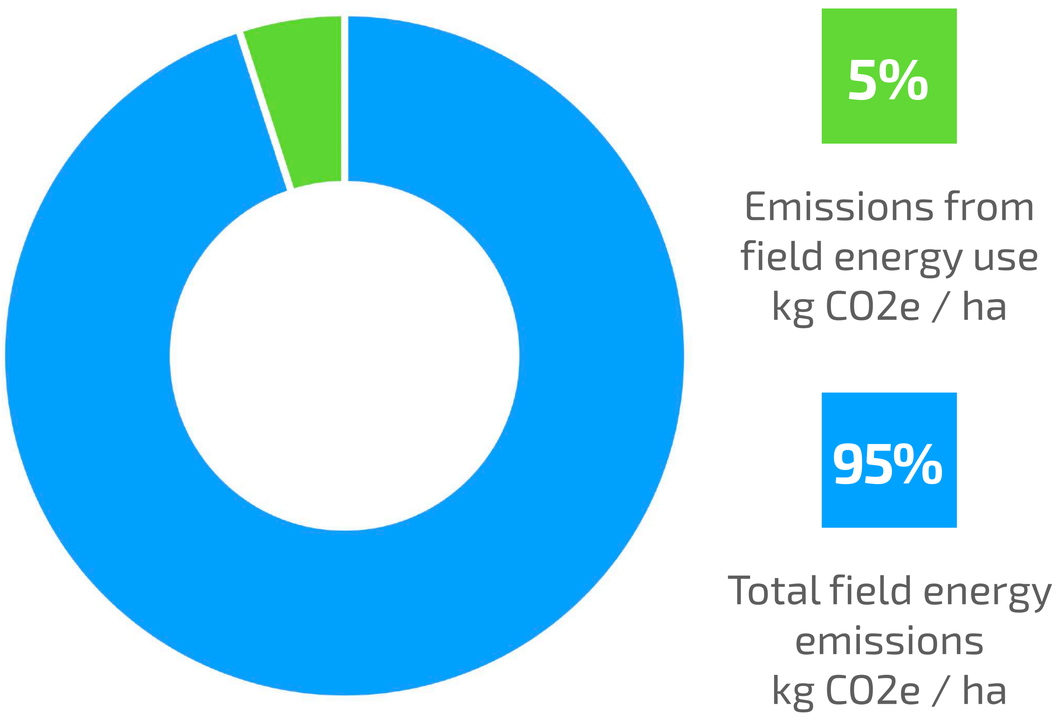
The replanting cycle varies for Fairtrade producers in different origins, and depends on a number of agro-ecological, varietal and economic factors. For sugarcane smallholders, this means, when compared to non-perennial crops:

- low use of machinery and fossil fuel in the production cycle
- little soil disturbance and the opportunity to use minimum tillage
- high potential for soil carbon sequestration

Positive outcomes: field energy vs total field/farm energy emissions

On any given farm, total direct and indirect GHG emissions caused by the farming system include field energy (e.g. the energy required for agricultural machinery and irrigation within the farm boundaries); crop residues; inputs such as fertilisers, herbicides, fungicides and pesticides; transport; and changes in land use and farming practices.

The studies suggest that in Fairtrade smallholder sugarcane production, field energy consistently accounts for only a small percentage of total emissions, mainly because of the minimal use of agricultural machinery and fossil fuels. On the farms studied, the average GHG emissions from the use of machinery represent just 5.35 percent of the total emissions from one hectare of cultivated sugarcane.



Emissions from the use of machinery as a percentage of the total emissions from the cultivation of one hectare of sugarcane

Positive outcomes: farming practices and carbon stocks

The use of minimum tillage, mulching practices and organic fertilisation on small-scale Fairtrade sugarcane co-ops tends to increase carbon stocks in the soil. The C&W footprint studies did not include carbon sequestration in the overall emissions balance but calculated it separately - showing some very encouraging results:

- **Mauritius**: Fairtrade sugarcane producers offset up to 40 percent of their agricultural emissions by fixing carbon in the soil.
- **Eswatini**: five out of six SPOs show that carbon sequestration may exceed GHG emissions at farm level.
- **El Salvador**: changes in carbon stocks overcome the emissions at the agricultural level.
- **Costa Rica**: in two out of the three co-ops assessed, soil carbon sequestration offset 15 and 22 percent respectively of total emissions at farm level.
- **Fiji**: estimates of carbon sequestration show that carbon sequestered in soil has the potential to offset up to 15 percent of farm level emissions.
- **Belize**: estimates of soil carbon sequestration amount to 12.7 kg CO2 per tonne of sugarcane produced - 28 percent of the total emissions per tonne.

Positive outcomes: plant efficiency and the impact on water footprint

As noted above, sugarcane is a C4 crop, with high radiation, nitrogen and water use efficiencies.

According to the C&W Footprint studies carried out by the consultant, those Fairtrade sugar producers evaluated have a significantly lower water footprint and are more efficient in their use of nitrogen in their production cycle per volume of the final product, when compared to other crops*. This is particularly important as nitrogen fertilisers emit nitrous oxide (N2O), a compound which, according to the Intergovernmental Panel on Climate Change (IPCC) has 298 times the global warming potential (GWP) of CO2. Although only one percent of nitrogen applied results in N2O emissions, using less fertiliser significantly lowers emissions and the GWP of the farming system.

On average, to produce 1kg of Fairtrade sugar uses just:

** According to the International Sugar Organization (ISO), cocoa beans, green coffee, seed cotton, wheat and barley have a much higher water footprint than sugar.*

Positive outcomes: residue management

Residue management is a hot topic in sugarcane cultivation. For decades, burning the crop before cutting it for delivery to the mill has been the accepted practice in most smallholder sugarcane origins as it makes manual harvesting easier and safer for farmers and cutters. In recent years, in some countries the industry has been moving towards 'green cane' harvesting to reduce GHG emissions and biodiversity loss. Green cane harvesting is required for organic sugar production, but even amongst conventional Fairtrade sugar producers it is increasingly becoming common practice.

In **Cuba**, for example, where there are four Fairtrade certified organic sugar co-ops, there is a long history of banning burning and practising green cane harvesting across the entire sugarcane sector.

Fairtrade sugar producers in different origins have reduced or banned pre- harvest burning and instead use the crop residue for mulching, fertiliser production and (in addition to bagasse) for generating electricity.

In **Mauritius**, **Fiji** and supply chains covered by the study in **India**, Fairtrade sugarcane smallholders provide outstanding examples of adopting green cane harvesting on large scale and banning pre-harvest burning.

- **India**: at the SPOs studied (six organic SPOs and one conventional SPO), the transition to green cane harvesting is supported by local governments through a system of subsidies and incentives to both producers and factories.
- **Mauritius**: green cane harvesting is incentivised - producers are remunerated based on the sugar, molasses and fibre content of their sugarcane, and they also benefit directly from bagasse income. During the 2021 harvest, for example, burnt cane represented only four percent of the total supplied to mills in Mauritius, because the sugar industry has realised that fresh green cane is essential for producing special sugars of consistent quality. Together with a planned biomass framework, these measures should further support industry-wide adoption of green cane harvesting.
- **Fiji**: the industry encourages producers to harvest fresh sugarcane, not only to preserve the country's reputation as a tourist destination, but to reduce GHG emissions and to increase the sucrose content of sugarcane.

Positive outcomes: soil fertility and fertiliser

Despite improvements, fertiliser and crop residue remain the two biggest causes of emissions for the Fairtrade sugarcane co-ops evaluated in the C & W footprint studies. This is partly because most Fairtrade cane sugar origins lack fertiliser production facilities, so it has to be imported and transported from other countries. In most origins, importing and applying synthetic fertiliser is the first or second biggest cause of farm level emissions.

The studies enable Fairtrade to support producers to manufacture and apply fertiliser with lower emissions, and to manage their crop residues to create fewer emissions and promote soil carbon sequestration.

In **Mauritius** - the first country chosen for a C & W Footprint study - Fairtrade is piloting a follow-up project for the production of zero emission, home-made biofertiliser in two of the smallest Fairtrade co-ops.

The project aims to lower GHG emissions and improve soil health and fertility, whilst - given the high price of imported synthetic fertiliser - reducing farmers' production costs and increasing their income through higher yields. The pilot will be monitored by industry partners and a steering committee and, if relevant and successful, will be rolled out to other Fairtrade producers.

In addition to the C & W Footprint studies, Fairtrade continuously monitors for new research and initiatives to drive reductions in emissions and boost productivity. During our research for a climate study in sugar supply chains in the **Indian state of Uttar Pradesh**, for example, we came across an innovative system of biofertiliser production which uses spent wash (the liquid left after distillation) from the ethanol distillery, press mud (compressed waste) from the sugar factory and harvested rainwater to produce biofertiliser which is then distributed to the co-op producers.

Mawana organic fertiliser plant in Uttar Pradesh, India
© Fairtrade

Positive outcomes: water footprint

The Water Footprint Network defines three types of water footprint:

Green water

the amount of rainwater required (evaporated or used directly) to produce a unit of product

Blue water*

the amount of surface water and groundwater required (evaporated or used directly) to produce a product

Grey water**

the amount of freshwater required to assimilate pollutants to meet specific water quality standards

* *Irrigated agriculture, industry and domestic water use, for example, each have a blue water footprint.*

*** grey water, for example, comes directly through a pipe or indirectly through runoff or leaching*

The C & W Footprint studies suggest that the water footprint of Fairtrade certified sugarcane production is relatively low and that green water makes up most of the overall water footprint.

Green water footprint results show that sugarcane depends on seasonal rain for healthy growth (as opposed to unpredictable storms and floods which damage the crop and make fields inaccessible). Sugarcane grown in countries with higher average temperatures requires more water.

The studies demonstrate that most of the Fairtrade origins researched enjoy sufficient rainfall without the need for irrigation. The exceptions were **Eswatini** and some parts of **Mauritius**, where irrigation is needed due to low regional precipitation, and where the blue water footprint relating to irrigation was thus taken into account. Nonetheless, the studies found that overall, blue water contributes little or nothing to the water footprint of sugarcane production.

- **In Eswatini,** blue water makes up a significant proportion of the overall water footprint, because sugarcane is irrigated due to the low average annual rainfall (589mm/year). Farmers use different irrigation systems, with drip irrigation being the most efficient in terms of water used per tonne of cane produced.
- **In Fiji,** the total water footprint of 1kg of raw sugar amounts to 1,768 litres. However, most of the water footprint consists of renewable rainwater, meaning water usage for sugar production can be considered sustainable.

Promoting water efficiency is a key priority for Fairtrade producers mitigating and adapting to climate change. In many Fairtrade origins, waste processing water from sugar mills and factories is recycled for field irrigation and fertilisation, instead of being discharged into sewers, rivers or lakes.

Positive outcomes: electricity co-generation and supply to the grid

Sugarcane biomass for electricity generation is part of the solution to climate change mitigation. Co-generation technology is used widely in those origins where the research covered both agriculture and processing, and bagasse is used to power sugar factories in all origins.

In sugar factories, processing residues are frequently used to generate electricity. When that surplus electricity is fed into the grid, it displaces other non-renewable energy sources, thereby reducing emissions. The displacement of grid electricity is an important benefit of an efficient cane sugar production.

In Mauritius, for example, the C&W footprint study found that "more emissions are avoided by displacing mainly fossil fuel-based energy sources for electricity generation than are emitted in sugarcane production, processing and inland transport combined."

An integrated approach to sugarcane production allows cane by-products to be used for renewable energy production at factory level, which in turn reduces GHG emissions.

In Mauritius, both bagasse and dry trash from sugarcane are used for generating power, resulting in a considerable reduction in fossil fuel emissions. In Mauritius and Belize, the studies found that renewable energy is distributed via the national grid and the saving in emissions is greater than all the GHGs emitted to produce the sugar.

According to the World Bank, around 20 percent of Mauritius' energy comes from renewable sources, with energy from bagasse accounting for 14 percent of total electricity production. The government has announced plans to increase renewable electricity generation to 60 percent by 2030 and further incentives to sugarcane farmers are expected.

It's a similar positive story in many other Fairtrade origins, where the studies highlight emissions savings from electricity co-generation in Belize, Eswatini and India.

In Mauritius, 0.53 kg CO2e of emissions are avoided per kg of sugar, which wholly compensates for the product footprint.

In Eswatini and Belize, it is 0.16 kg and 0.11 kg CO2e respectively.

Solar power plant at the Phakama Mafukula sugar co-op in Eswatini
© Phakama Mafukula / Fairtrade Africa

Carbon and Water Footprint studies

Country snapshot: Belize

Emissions: 0.45 kg CO2e per kg of sugar* at farm level. Of the evaluated supply chains, emissions from mills in Belize and Fiji were the lowest.

Emission displacement and system expansion: most of the electricity needs of the sugar mill comes from bagasse combustion. According to the study, displaced emissions from electricity co-generation exceeded the negative climate impact of the sugar mill in FY 2020. "Reductions in the average emission factor of Belize's grid electricity will reduce this quantifiable climate benefit in the future, at least in relative terms," it notes (SMI 2023).

Machinery plays a marginal role, since hand labour is mainly used.

Water: none of the farms in Belize use irrigation. Not only does this mean that Belize compares well to other origins in the use of local surface and groundwater resources, it also means that no energy is needed for irrigation.

** Without management change data. Based on remote sensing data-based land use change (LUC) approach, compared to 0.76 kg CO2e per kg (national average LUC-based approach) and primary data 1.04 kg CO2e per kg raw.*

Carbon and Water Footprint studies

Country snapshot: Costa Rica*

Emissions:

- CoopeAgri: 0.91 kg CO2e per kg of sugar (raw sugar for refining, plantation white), including outbound transport. Without outbound transport, emissions are 0.69 CO2e kg of sugar (can be reduced by 22 percent if accounting for emissions displaced by renewable electricity generation at the mill).
- CoopeVictoria: 0.85 kg CO2e per kg of sugar, including outbound transport. Without outbound transport, emissions are 0.65 kg CO2e per kg of sugar.

Co-ops: Costa Rican Fairtrade sugar co-ops operate beyond cane production - both CoopeAgri and CoopeVictoria grow sugarcane and coffee, and each own a co-op mill. Unlike others studied, these two co-ops are the only supply chains both growing and producing sugarcane and cane sugar.

Crop residue: Whilst it is common practice in Costa Rica to burn sugarcane crop residues, many Fairtrade producers have abandoned this practice. Fairtrade's agro-ecology policy encourages and supports the entire industry to follow their example.

Water footprint: not all farms use irrigation, as there is enough rain - and those that do use drip irrigation. The grey water footprint results mainly from the use of herbicides and pesticides.

Carbon sequestration: cultivation practices at the co-ops included in the study promote the build-up of carbon in the soil. The stored carbon in the soil reduces the footprint of the sugar by almost 0.20 kg CO2e.

** NB co-ops in Costa Rica own their cooperative processing plant.*

Carbon and Water Footprint studies

Country snapshot: El Salvador*

Emissions: 0.025 kg CO_2e per kg of sugarcane (NB: the El Salvador study only accounted for agricultural production).

Water: the combined water footprint for the production of one tonne of sugarcane in El Salvador is just 156.1 m3 - a remarkable figure which reflects a high degree of water management efficiency by sugar co-ops.

Fertiliser: fertiliser use in El Salvador is by far the most efficient (kg of fertiliser per kg of product) of all the SMI studies, mainly due to excellent resource management and the agro-climatic conditions enjoyed by producers.

Crop residue: the study recommends that producers reduce pre-harvest cane burning to limit GHG emissions and threats to biodiversity and human health.

** NB this study was carried out only at farm level.*

Carbon and Water Footprint studies

Country snapshot: Eswatini

Emissions: 0.80 kg CO2e per kg of sugar (white refined, direct consumption (DC) and raw sugar for refining), including outbound transport. Without outbound transport (post sugar processing), emissions are 0.55 kg CO2e per kg sugar.

Productivity: in Eswatini, the average yield (90 tonnes/ha) is higher than in other Fairtrade origins covered by the studies.

Emission displacement and system expansion: after accounting for emissions displaced by electricity produced from sustainable sources, the balance of emissions from cane sugar production is 0.39 kg CO2e per kg of sugar. On average, 0.16 kg CO2e is saved per kg of sugar produced up to the point of export.

Water footprint: adoption of drip irrigation in Eswatini is showing great results, not only for yields but also for emissions and water footprint. According to the Eswatini study, producers there using drip irrigation have the lowest water footprint.

Carbon and Water Footprint studies

Country snapshot: Fiji

Emissions: 0.84kg CO2e per kg sugar (raw sugar for refining plus small amounts of DC sugar) including outbound transport. Without outbound transport, emissions are only 0.54 kg CO2e per kg.

Emission displacement and system expansion: After accounting for emissions displaced by electricity produced from sustainable sources, the balance of emissions from sugar production is 0.54 kg CO2e per kg of sugar. Applying the system expansion method*, the average displacement effect (-0.06 kg CO2e per kg sugar) is double the average processing emissions (0.03 kg CO2e per kg sugar). Of the evaluated supply chains, emissions from mills in Fiji and Belize were the lowest.

The net carbon stock removal in those co-ops studied amounts to -9.16 kg CO2e per tonne of sugarcane, mostly due to organic fertilisation and plant stone sequestration. In the logic of carbon emissions and sequestration, a positive value means emissions and a negative value means sequestration.

Water footprint: the blue and green water footprints are negligible as irrigation of sugarcane fields is very rarely used. Fiji's combined sugarcane and milling water footprint is 1,768 litres per kg of raw cane sugar. Most of this combined water footprint comes from rainwater used to grow the crop, and reflects a sustainable use of water resources by sugarcane producers.

** Avoided emissions are calculated using system expansion for surplus electricity generated from bagasse fed into the grid.*

Following the C&W Footprint study, a two-day roundtable, *Enduring partnerships for evolving Green, Climate resilient and Productive Cane*, was held in partnership with the Fiji Sugar Corporation (FSC) and Fairtrade International.

The roundtable shared the results of the study and aimed to devise an achievable roadmap to make the sugarcane industry greener, more resilient to climate change and more sustainable. Read a full report here.

Carbon and Water Footprint studies

Country snapshot: India*

Emissions: 0.01 kg CO2e per kg of sugarcane (conventional SPOs), and 0.02 kg CO2e per kg of sugarcane (organic SPOs).

Organic production: despite the higher CO2e per kg emissions, organic sugarcane farming has lower overall GHG emissions per ha. Only four percent of the Fairtrade producers studied in India practice conventional agriculture.

Crop residue: all Fairtrade sugar producers evaluated, whether organic or conventional, practice green cane harvesting and do not burn cane pre-harvest. Crop residue is used for mulching, composting and partly processed as animal feed.

Fertiliser: the non-organic Mawana mill in Uttar Pradesh uses press mud from the factory, spent wash from the ethanol distillery and harvested rainwater to produce high quality, low emission organic fertiliser.

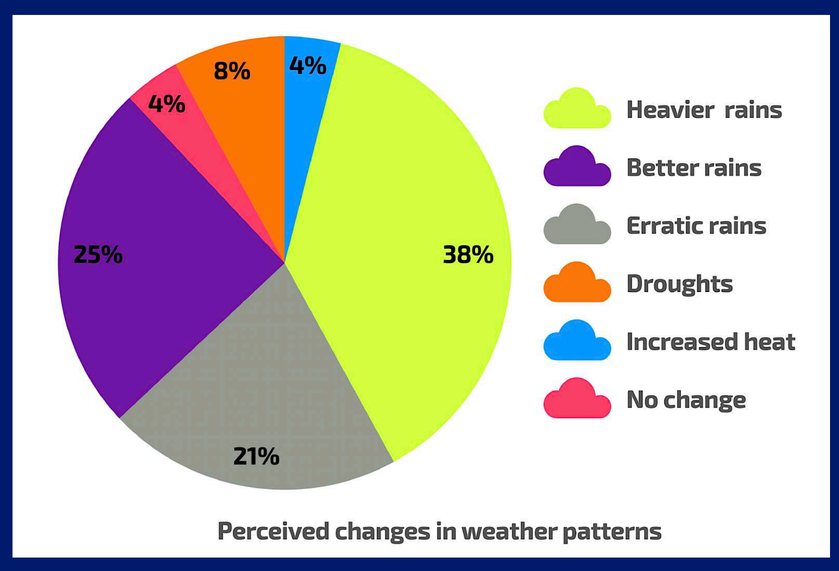
**NB six organic SPOs and one non-organic SPO were studied (at farm level). In addition, discussions with the Mawana mill were held.*

Impacts of changing weather patterns in India

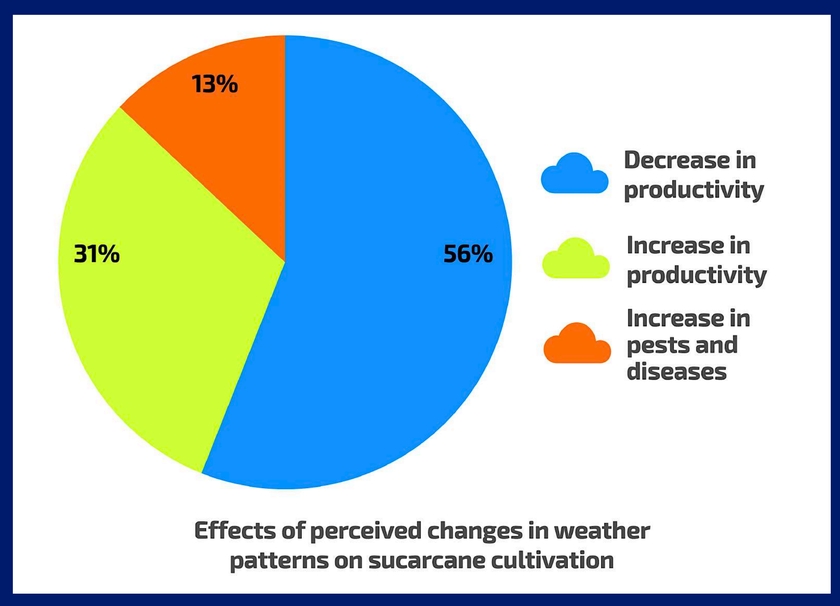
Ninety percent of producers surveyed believed weather patterns had changed over the past two decades.

Producers based in Karnataka thought productivity had increased because of changing weather patterns, but their colleagues in Maharashtra said the opposite - that production was down.

Maharashtra - particularly the area where Fairtrade producers are based - has experienced rising temperatures and increased rainfall during the rainy season in the last 20 years. Producers in Maharashtra also reported that more prolonged droughts were negatively affecting sugarcane productivity when irrigation is unavailable.



Perceived changes in weather patterns



Effects of perceived changes in weather patterns on sucarcane cultivation

Carbon and Water Footprint studies

Country snapshot: Mauritius

Emissions: 0.36 kg CO2e per kg of sugar (white refined and special raw sugars) up to the point of export. Of total emissions, only 27 percent are attributed to sugarcane cultivation.

Emission displacement and system expansion: after accounting for emissions displaced by electricity produced from sustainable sources, the balance of emissions from cane sugar production is negative. For every kilo of Fairtrade certified sugar purchased from Mauritius, the average emission saving is 0.17 kg CO2e

Waste: minimum waste is produced by mills in Mauritius. Almost every by-product is reused in the production cycle and to produce sugar, drinkable alcohol, ethanol, food grade CO2, biofertilisers and electricity.

Fertiliser: Fairtrade and Fairtrade co-ops are piloting a biofertiliser programme using crop residues to further reduce the emissions from sugar production.

Water footprint: few farms evaluated use irrigation. "The water footprint of the agricultural production of Fairtrade sugarcane in Mauritius is slightly lower than the global weighted average" (SMI 2020). For processed sugar, water consumption at the cultivation stage amounts to 67 litres per kg sugar (or 53.3 litres per kg sugar when waste water from refineries used for irrigation is taken into account).

Agricultural production: farm level emissions account for just one-third of the total GHGs emitted during the production cycle of one kilo of sugar.

If you are interested in the full studies or wish to foster your relationship with specific supply chains, please contact:

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Conclusions

International Sugar Organisation (ISO)

According to an ISO side event held at COP 26 in Glasgow, sugar has three main advantages: a low carbon footprint; low water footprint; and its role in generating sustainable renewable energy (electricity from biomass; cogeneration of bagasse; and biofuels such as Ethanol). ISO concluded:

- Sugar's carbon and the water footprints are generally naturally low, and could be even lower with more investment in technology and capacity building.
- Biomass for electricity generation and biofuels from sugar crops can be part of the solution to climate change mitigation, and they can play a bigger role.
- The sugar industry has great examples around the world of Climate Action (SDG 13) and Clean Energy (SDG 7), and it also contributes to advances in SDG 6, SDG 9, SDG 12, SDG 15 and SDG 17.

Fairtrade

- In most of the origins studied, agricultural production is a larger contributor to the overall footprint of sugarcane than processing.
- This is mainly due to applying fertilisers which have to be imported, often from countries with high emission energy supplies, which come with a high carbon footprint.
- Emissions from processing sugarcane are low because the sugar by-products are used for energy production (bagasse cogeneration).
- Where Fairtrade supply chains were compared to other countries (e.g. Brazil, based on data from 2017), the Fairtrade supply chains performed better in terms of overall C&W footprint.

Intercropping on a Fairtrade certified organic sugar co-op in Cuba
© CLAC / Fairtrade

Fair climate action is working together.

Fairtrade offers many ways for companies and brands to put their values into action in their supply chain. Choosing to make your business more responsible, while supporting farmers and workers worldwide, is a great decision. Entering into new agreements to source sustainable sugar is a forward-looking business strategy which will help future-proof your supply chains. Work with us to transform your sugar supply chain and discover what is fair!

For further information about how to partner with Fairtrade sugar supply chains, or to enter into new Fairtrade sugar sourcing commitments, visit www.fairtrade.net/act/fairtrade-for-business, contact your local National Fairtrade Organisation, or the Senior Advisor Sugar Monika Berresheim: m.berresheim@fairtrade.net

The content of this document is based on the original studies, revised by consultant Luca Desideri and finalised by Fairtrade International.

Green manure demonstration plot on a Fairtrade certified organic sugar co-op in India © Fairtrade

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