
TURNING
THE
PAST
INTO
ACTION
DanChurchAid
actalliance

Cover Photos: Peter Solbjerghøj, Biafra 1968 & Bax Lindhardt, Kenya 2019

Background

DanChurchAid was created in 1922, and for 100 years the organisation has contributed to long term development and provided support during humanitarian emergencies around the world. The efforts as well as the results have been extensive. Lives have been saved, and people and communities have been empowered so that they themselves can develop and prosper.

However, the development path of the world has not been sustainable for many years. We have all been part of a development built on fossil fuels, and activities have led to emissions which have been fueling global warming and climate change.

Today we know that we are already facing a climate crisis. More and more of the problems DanChurhAid is trying to address around the world are linked to this crisis, and it is evident that the crisis not only needs to be managed but also solved.

As an organisation, building on 100 years with emissions, DanChurchAid has a responsibility. Can this responsibility be turned into a sustainable development that contributes to a solution for the climate crisis? Is it possible to turn the past into action?

Climate responsibility

DanChurchAid wants to take responsibility for emissions that contribute to climate change. That means responsibility for the past, the present, and the future.

The first DanChurchAid carbon footprint report covers 2019. However, it only included emissions from activities in Denmark. The commitment, and plan, is to develop monitoring procedures to ensure that future footprint reports will cover all activities, in both Denmark and partner countries. According to the DanChurchAid global strategy, a full carbon footprint report will be possible from 2026.

Together with an improved monitoring of emissions, emission reduction targets will be set. The internal climate policy has been developed to promote emission reduction, and the targets will ensure that emissions are addressed and reduced over time. Reduction targets for the organisation will be set by 2026 at the latest.

Since 2013 DanChurchAid has compensated emissions from international transport, through tree planting and support to climate adaptation in developing countries. This practice continues and will ensure that emissions, which cannot be reduced right now, are compensated.

While present and future emissions are monitored and documented, historic emissions are more difficult to map. Emissions from 100 years of activities have accumulated a historic responsibility, which must also be addressed. This paper describes how the historic responsibility has been estimated and what we want to do about it.

Disclaimer

There is no agreed method for how to count historic emissions, and DanChurchAid will not claim to have the perfect approach nor that we can take full responsibility. We acknowledge that people and communities are already affected by the effects of climate change, and that this cannot be "compensated". However, through this initiative DanChurchAid aims to learn more about historic responsibility to see whether it is possible at least to turn a considerable part of the past emissions into action.

We hope to learn from this initiative, and we are happy to share our learning. However, the learning and the DanChurchAid example should not be seen as a guide nor as the only way to approach historic responsibility. Instead, we hope it will provide inspiration and contribute to the debate about how to address the climate crisis.

Two principles have guided us through the research:

1. A rough estimate is better than no estimate (i.e., it is better to take responsibility for some emissions than to take no responsibility at all)
2. If we are in doubt, we choose the high emission scenario (i.e., it is better to take on a larger responsibility than to take to little).

The action

So how will the past be turned into action? As mentioned above, DanChurchAid already has a compensation scheme where emissions which cannot be reduced right now are compensated through tree planting and support to local communities facing the effects of climate change. This scheme will also be used to take responsibility for historic emissions.

To act on all emissions at once is not possible. However, as emissions have accumulated over time, it will also take time to deliver on the responsibility. The aim will be to plant trees, from 2023 to 2025, which will sequester – absorb - the same amount of carbon as the estimated total of CO2 emissions related to DanChurchAid activities since 1922.

Sequestration of carbon is done in cooperation with the DCA partner EcoTrust in Uganda. EcoTrust tree planting is certified by the internationally acknowledged Plan Vivo, and third party verified by the Rainforest Alliance. EcoTrust has a landscape approach, where tree planting is combined with community development. For DCA it was also important to find a partner that had a focus on the risk of leakage, to avoid double counting, and to ensure that sequestration is additional, i.e., that it would not have happened without the intervention.

The commitment to support those who are affected by climate change is equally important for the DanChurchAid approach to climate responsibility. Adaptation, and action to address climate induced loss and damage, are supported through different partners.

Counting emissions in the past

To count emissions in the past is not easy. With available data it is impossible to obtain an accurate estimate, and all data will be based on larger or smaller estimates. However, even a rough estimate, building on some sort of data and analysed based on a transparent method, will give a picture of the accumulated responsibility. Some estimates may be too high, while others may be too low, and with a scope of 100 years, mistakes can multiply. Still, the total picture will be interesting, at least if it is combined with considerations and disclaimers about the limitations.

There are three types of available data. The first is annual reports and other narrative information about the activities of DanChurchAid. The second is annual financial reports which give clear information about money spent on different activities. And the third type of data is the memories of older staff who have been part of the work over the years.

Both validity and reliability of the data differ. As an example, there is no annual data for the number of air travel flights, and estimates would be obtained based on narrative reports about activities and budgets. But there

is an exact number of secondhand shops, and we know the turnover per year.

The uncertainty in the data must be acknowledged, and a buffer has therefore been added. The uncertainty buffer is between 5% and 10%, depending on the data. This means that all estimated emissions have been increased by a certain percentage. Data which is based on narrative and financial reports are in many cases reliable. As an example, we know the size of all secondhand shops, and emissions from heating and energy can therefore be estimated relatively accurately. However, data which is based on interviews is uncertain, especially with respect to activities conducted several decades ago. The buffer has been applied as a way to cover the more uncertain data.

Some data is missing. This is the case for example when annual report formats differ from the standard, or where information cannot be found. When data is missing, other data, as close as possible in time to the missing data have been used instead.

While there is no agreed approach about the accounting of historic emissions, there have been a lot of debates, and initiatives, related to accounting of current emissions. An acknowledged practice is to differentiate between scope one, two and three. Scope one relates to direct emissions from activities which are owned or controlled by the organisation. Scope two relates to indirect emissions which occur because of activities which are purchased, including heating and electricity. And scope three relates to indirect emissions of upstream and downstream supply chains.

The prime responsibility of an organisation relates to scope one and two. However, scope three is also relevant because these emissions would not have happened without the intervention of the organisation. The historic emissions of DanChurchAid have been mapped based on scope one and two plus emissions from international flights, which are included in scope three. We are aware this approach excludes emissions related to purchased goods for example. That is a limitation which should be acknowledged. However, at the same time there is no data available for how different goods have been produced, nor any data about the type of goods which have been purchased and used.

Greenhouse gasses covered by the assessment

There are many greenhouse gasses contributing to global warming. For DCA activities, CO2 is by far the most important and is related to scope 1 and 2 and, for flights, to scope 3. However, other emissions can also be relevant. In those cases, CO2 equivalent emissions have been used to enable comparison and transparency.

In this paper "CO2" has been used for "CO2 equivalent".

Method

It has not been possible to assess each activity during the 100 years. That task would be too extensive, and the end result would not reflect the increased time and effort. The aim has thus not been to create an exact mapping of historic emissions, but to make a valid estimate.

The estimate is based on six elements: 1) assessment and identification of activities and available data, 2) identification of emissions factors and calculation methods, 3) an energy efficiency factor, 4) a carbon intensity factor, 5) an uncertainty factor, 6) time periods. These elements are described below.

The two first elements are used to estimate the emission from a particular activity. The first element will deliver data about activities (called data below) which can be used to estimate emissions. The second element delivers a formula (called Emission calculation below) which can be used to turn the activity data into CO2. The next three elements are factors (counted as percent) which can be added where relevant. Each of these factors may increase or decrease the estimated emission. In the last element, data, emission calculation and the three factors are divided into time periods.

1. Assessment of activity data which can be related to emissions

The first assessment is built on the data from DanChurchAid's archives, as well as interviews, and explores possibilities to estimate emissions. As an example, there is no data for CO2 emissions from airlifts. However, there are some data about the number of flights, cargo weight, distance etc.

The identification of activities generated a list of data categories to use in further analysis.

2. Identification of emission calculation methods

As there are very limited data for CO2 emissions (only in recent years where footprint reports have been made for Danish activities), calculations must be done. These calculations are based on emission factors and algorithms which can turn the data (e.g., square meters or annual

turnover) into CO2. Emission factors are sometimes calculated, and sometimes obtained from official and reliable research. The emission calculation methods differ between activities, and sometimes also between time periods.

Emission factors are always built on assumptions, and there is always uncertainty about the result. Acknowledging that there are different ways to count, we have prioritised transparency. Selection of emission factors is based on reliability and validity. As an example, the calculation of airlifts mentioned above is based on a formula which is used by the British Department of Environment, Food, and Rural Affairs.

3. Energy efficiency

It is important to consider energy efficiency because technology development has had a big effect on emissions, especially during the past decades. As an example, a car produced in 2021 will not have the same energy efficiency as a car had in 1922.

Energy efficiency is calculated by two different factors. For flights, an energy efficiency factor from the Danish Ministry of Environment was applied, and for other activities a factor from EU Odyssee-Mure was applied.

Energy efficiency has changed over time. The oil crisis in 1972 is an important event. Before 1972, there had been very limited focus on energy efficiency, but when energy prices increased in the 1970s, it also become relevant to improve energy efficiency. The World Conference on Environment and Development in 1992 was another important event because this was when governments agreed to start to reduce emissions.

Energy efficiency has been applied to all activities, but only from 1972, because energy efficiency before the oil crisis is assumed to be limited. The energy efficiency factor is applied as an average per year. However, in reality, energy efficiency has most likely been introduced in steps. As an example, the benefit of a new and more efficient car will only be realised when a new car is bought. And that may not happen until the old car breaks down.

4. Carbon intensity

It is important to consider carbon intensity in relation to activities where CO2 emission is uncertain and linked to energy production. Emissions from energy production differ depending on the source of the energy. A coal power plant will have larger emissions than a wind farm.

Carbon intensity differs over time. For Denmark there is reliable data, but for DCA partner countries the data is missing. For most partner countries, energy production still comes from fossil fuel, and carbon intensity has not been applied.

5. Uncertainty factor

As mentioned above both data and emission factors can be uncertain. However, uncertainty differs, and this should also be considered in the analysis. Four categories of uncertainty have been identified.

Uncertainty	Data	Uncertainty factor
No uncertainty	Annual foot print report	0%
Low uncertainty	Indexed data based on reliable data (annual turnover, number of second hand shops, etc)	5%
High uncertainty	Indexed data based on valid but unreliable data (interviews, estimates based on narrative reports)	10%

An additional 20% buffer is added when the trees are planted. This buffer is added separately after the total calculation has been done and it is added because of risks related to tree planting.

6. Time periods

Several activities last for several decades and conditions as well as data availability may change. By dividing activities into time periods, changes are possible in the emission factors, the energy efficiency, and the uncertainty factor. Within each time period, the same conditions (data, emission factor, energy efficiency factor, carbon intensity factor and uncertainty factor) apply.

The historic assessment

The activity categories included in the estimation are

listed below, together with a brief explanation of related data, emission calculations and time periods.

Offices

Office activities have developed over time, as in other organisations and companies. In the early days emissions were most likely limited to heating and light. Later, electrified office equipment, including computers, were introduced that required more energy. However, office related emissions are not only linked to the number of devices, but also to the energy source and the degree of insulation of the building, which have changed over time. There is no documentation of heating in the first DCA office, but it was most likely coal or coke. Over time this heating source changed to oil and then to central heating. The DCA headquarters has always been in Copenhagen, but additional smaller offices have been established in other cities in Denmark.

There are six time periods.

1944-1955 (low uncertainty)
Emissions from the Danish offices were calculated based on the space (estimated in m2), information about energy source and considerations of technology development/energy efficiency. The Emission factor is based on electricity consumption in DCA. In the early years, electricity was limited to lighting and the estimate is therefore most likely to be high.

Data: Estimated m2

Emission calculation: Electricity: An emission factor (kWh/m2) based on DCA data was applied, together with a factor CO2/kWh, adjusted for changes in carbon intensity (Danish energy authority).
Heating: An emission factor (kWh/m2) based on DCA was applied, together with a factor for CO2/kWh, based on emissions from coal/coce.

1956-1971 (low uncertainty)
Emissions from Danish offices in this period were calculated in the same manner as the previous period but are based on heating emissions from oil because the heating source was changed.

Data: Estimated m2

Emission calculation: Electricity: An emission factor (kWh/m2) based on DCA data was applied, together with a factor CO2/kWh, adjusted for changes in carbon intensity (Danish energy authority).
Heating: An emission factor (kWh/m2) based on DCA was applied, together with a factor for CO2/kWh, based on emissions from oil.

1972-1997 (low uncertainty)
This period began with the oil crisis which had an effect on energy efficiency and means that emissions began to decrease. This change has been considered from 1972 using an energy efficiency factor.

Data: Estimated m2

Emission calculation: Electricity: An emission factor (kWh/m2) based on DCA data was applied, together with a factor CO2/kWh, adjusted for changes in carbon intensity (Danish energy authority).
Heating: An emission factor (kWh/m2) based on DCA was applied, together with a factor for CO2/kWh, based on emissions from oil.

1998-2017 (low uncertainty)
From 1998 the DCA office had central heating. This had an effect on emissions from heating.

Data: Estimated m2

Emission calculation: Electricity: An emission factor (kWh/m2) based on DCA data was applied, together with a factor CO2/kWh, adjusted for changes in carbon intensity (Danish energy authority).
Heating: An emission factor (kWh/m2) based on DCA was applied, together with a factor for CO2/kWh, based on emissions from the Danish energy mix (Danish energy authority).

2018 (low uncertainty)
2018 is counted as a separate time period because emissions are calculated based on the 2019 footprint report and energy efficiency factor.

Data: Heating consumption (kWh) and electricity consumption (kWh) are from the 2019 footprint report.

Emission calculation: Energy efficiency

2019-2021 (no uncertainty)
Emission for offices in Denmark are included in the annual footprint reports from 2019.

Data: Annual footprint report.

Cars in Denmark

Transport in Denmark refers only to cars owned by DCA. Much of the transport related to secondhand shops has been done with private vehicles owned by volunteers. There is no data for this transport and as these cars were not owned by DCA, they are not included.

Emissions from transport have been divided into two time periods.

1972-2018 (low uncertainty)
The first period, 1972-2018, begin when DCA opened the first secondhand shop. This activity made transport necessary. In this period emissions are calculated backwards, from a baseline in 2020. CO2 emissions in 2020 were linked to the number of cars and number of shops, and emissions from cars were estimated throughout the time period using a calculated factor.

From 1972, energy efficiency began to improve, and this is reflected in the calculations.

Data: Number of shops.

Emission factor: Amount of CO2 from transport per shop (estimate based on 2020 footprint report)

2019-2021
Since 2019 there are footprint reports for DCA activities, and CO2 emission is already documented.

Data: CO2 emission as reported in the DCA footprint report.

Secondhand shops and Wefood shops

Emissions from secondhand shops, as with offices, are related to heating and electricity. As shops are located in different buildings, with different conditions, the need for heating differs. However, with more than 100 shops, we have decided to use calculations based on average data.

The main use of electricity in secondhand shops has been for lighting. Energy efficiency for lighting has improved drastically, but this change has happened in stages when lights were changed rather than when new and more energy efficient lighting became available. It is thus difficult to obtain an accurate estimate. Instead, the estimate has been based on data for energy use per square meter. This estimate is based on data from secondhand shops in 2019.

1972-2018 (low uncertainty)
Data: Number of shops and average square meters per shop

Emission calculation: Heating: Factors based on DCA data from 2019, for kWh/m2 and CO2/kWh based on Danish energy mix. Energy efficiency has been considered.
Electricity: Factors based on DCA data from 2019, for kWh/m2 and CO2/kWh based on Danish energy mix. Energy efficiency has been considered.

2019-2021 (no uncertainty)
For this period DCA has footprint reports including CO2 data for secondhand shops and Wefood shops.

Data: Data from the annual footprint report for electricity

Financial support and delivery of goods to partners

An important activity throughout DCA history has been to provide financial support to partners. However, modalities as well as monitoring practice have differed over time. During the first decades, money was sent without close monitoring. Later, money transfer was combined with partner visits from Denmark, and yet later, monitoring was decentralised to country offices.

Only emissions related to DCA engagement have been considered because there is no existing data for the activities which received the support. That means that whether the partner has used the funds for a diesel generator or for solar power does not influence calculation of DCA emissions.

Aid activities, where DCA has delivered goods, have been an important activity over time. Such activities began with goods, e.g., clothes, which were given as donations to DCA in Denmark and then transported to partners. The activity quickly developed, with DCA starting to procure goods which became an important element in airlifts where DCA filled cargo planes with goods. However, procurement continued when the lifts ended, and have remained an important activity within the DCA portfolio.

Emissions related to delivery of goods differ a lot. Procurement of staple crops from a neighboring country for example will have a different emission than that of a jeep that has been constructed with components produced and traded all over the world. It has not been possible to estimate emissions related to the production of goods, and such emissions have therefore not been considered in the analysis. However, DCA has managed the transport of the goods and this transport is therefore included in the analysis.

Throughout history DCA has also traveled to meet with partners, to develop strategies and to share information. For example, the Lutheran World Federation, the World Council of Churches, and later the ACT Alliance, have all been important alliances, and DCA has attended general assemblies and other meetings of these partners. However, for practical reasons emissions for these journeys have been included under the *Financial support and delivery of goods* calculation category. Even if these journeys were not focused on "monitoring", the nature of the meetings still contributed to monitoring because the agendas related to how cooperation and projects were advancing and developed.

Emissions related to both financial support and delivery of goods to partners are calculated based on flights. However, the activity is divided into five time periods.

1922-1949 (high uncertainty)
During this period activities took place in Europe, and transport was by train and bus. Transport-related emissions have been difficult to estimate, but as a rule of thumb we have calculated one flight for every 500,000 DKK in turnover.

Data: Turnover and estimated number of flights.

Emission calculation: CO2 per flight (based on data from 2018).

1950-1971 (high uncertainty)
An average number of annual flights was estimated based on information in annual reports and publications. This data was combined with an emission factor for average CO2 emissions per flight.

Data: Annual turnover and number of flights based on assessment of annual reports.

Emission calculation: Average CO2 emission per flight, based on flight data in 2018 from the DCA travel agent (Vejle Rejser).

1972-1998 (high uncertainty)
The oil crisis in 1972 had a large effect on energy efficiency, and for this period the energy efficiency factor has been changed. Apart from this, the calculation of CO2 emissions remains the same as for the previous period.

Data: Annual turnover and number of flights based on assessment of annual reports and interviews.

Emission calculation: Average CO2 emission per flight based on flight data in 2018 from DCA travel agent (Vejle Rejser).

1999-2011 (low uncertainty)
In 1999 DCA began self-implemented projects. This had a big effect on the number of flights, and thus a new period has been identified. From 1999 to 2011 emissions can be calculated based on existing DCA data on CO2 emissions from flights in 2012.

Data: Annual turnover

Emission calculation: Average CO2 emission per turnover based on average CO2 emission of flights in 2012.

2012-2021
Since 2012, DCA has compensated for all flights. Therefore no emissions are included.

Secondments

From 1967 to 1998 secondment of staff to partner organisations was an important activity. Danish experts were recruited to work together with local organisations and partners. Some of these secondments lasted a few months, while others lasted several years. In some cases, the seconded staff worked with projects supported by DCA, while other seconded staff had no formal link to projects supported by DCA.

Emissions related to secondments are primarily related to flights. When the seconded DCA staff member arrived at their place of work, he/she contributed and worked together with the local organisation and there are no data about related emissions or activities.

There is data about the number of secondments, and through interviews we learned about related travel. Emissions related to secondments were therefore calculated based on the estimated number of flights and average CO2 emission per flight.

There are two time periods identified for secondments. From 1967 to 1971 the same energy efficiency factor was used because aircraft engines over this period had not been greatly developed. However, in the second period, from 1972 to 1998, such engines had become more efficient, and the energy efficiency factor has been adjusted.

1967-1971
Data: Number of secondments based on annual reports, and number of flights based on interviews.

Emission calculation: Average CO2 emission per flight, based on average CO2 emission of flights in 2018 data according to data from the DCA travel agent (Vejle Rejser).

1972-1998
Data: Number of secondments based on annual reports, and number of flights based on interviews.

Emission calculation: Average CO2 emission per flight, based on average CO2 emission of flights in 2018 data according to data from the DCA travel agent (Vejle Rejser).

Airlifts

From 1967 to 1995, airlifts were an important type of activity in DCA. Airlifts were made with cargo aircraft, usually from neighboring countries, but sometimes also from Denmark and other countries further away.

Many of the airlifts included hundreds of flights. However, in most cases the initiatives were taken by DCA in cooperation with other NGOs. As an example, the airlift in relation to the war in Biafra, at the end of the 1960s, included several thousand flights, all as part of "Joint Church Aid". However, even if DanChurchAid was one of the central organisations behind the lift, 34 other churches and organisations took part in the initiative.

Airlifts are very similar to "delivery of goods", and smaller airlifts (airlifts of less than 500 tons) have therefore been included in the "delivery of goods" activity where the number of flights and related emissions are calculated based on the annual turnover. However, some of the airlifts were exceptional, and included hundreds of flights, and have therefore been assessed separately.
This approach will most likely lead to double counting because the annual turnover also increased due to the airlifts. However, when applying the principle of choosing a conservative approach, large airlifts have been counted separately.

Emissions from airlifts were estimated based on a mix of data, depending on availability. As an example, some airlifts were documented using the number of flights, while others were documented by type of aircraft and tons of cargo. For some airlifts the distance is clear, based on departure and arrival destinations. Nevertheless, some estimates have also been attempted.

1967-1972 (high uncertainty)
Data: Tons of cargo, number of flights, type of aircraft and number of supporting organisations.

Emission calculation: We used emissions factors for air freight as suggested by the UK government. This calculation includes a factor depending on the length of the flight (1,898 for domestic, 1,316 for short haul international, and 0,606 for international over 3700 km) as well as a factor related to irregularities (109%). It should be noted that aircraft were empty on their return flight.

1973-1995 (high uncertainty)
Data: Tons of cargo, number of flights, type of aircraft and number of supporting organisations.
Emission calculation: We used emissions factors for air freight suggested by the UK government. This calculation includes a factor depending on the length (1,898 for domestic, 1,316 for short haul international, and 0,606 for international over 3700 km) of the flight, as well as a factor related to irregularities (109%). It should be noted that aircraft were empty on their return flight.

Energy efficiency: From 1972 the focus on energy efficiency increased and an energy efficiency factor was added.

Country offices and partner cooperation

In the 1990s DCA partner cooperation started to become decentralised through the establishment of country offices. Country offices enabled a closer contact with partners and reduced the need for monitoring visits from Copenhagen. However, data indicate that the total number of flights continued because monitoring and reporting demands increased over the same period.

Emissions related to country offices are linked to heating/cooling, electricity, and local transport. All country offices have cars, and there is extensive travel around the country. In some countries, like India and Nepal, domestic flights have also been used. In general, the country offices have been connected to the local grid, with a diesel generator as backup in case of power cuts. While offices in Denmark use energy for heating, most country offices need energy for cooling.

There is no available data about historic energy use or emissions from country offices. However, country offices with a focus on partner cooperation have a similar setup and similar types of emissions. In 2022 the first CO2 footprint reports were submitted by country offices in Nepal and Cambodia. Data from these two offices were

used as a baseline to calculate estimated CO2 emissions in relation to annual country office turnover.

1989-2021 (high uncertainty)
Data: Annual turnover for a country office.

Emission calculation: Average CO2/country office turnover, based on average country office calculations for Cambodia and Nepal 2021.

Self-implemented interventions

When DCA began to clear mines and other explosives in post-war countries (1999), a new type of country office was established. These offices hire hundreds of local staff and use different types of equipment, including mine-detectors. Each intervention has vehicles but compared to the country offices focused on partner cooperation, the travel distance is shorter because offices are located close to the intervention location.

Mine clearance is often conducted in areas with limited or no access to electricity. Thus, these offices, in most cases, have depended on diesel generators. The generators have been used both for charging of equipment, such as detectors, and in connection with accommodation.

While most staff are local, mine clearance activities also include international staff. The number of international staff has usually decreased over time because local staff were trained to take charge of the interventions.

There is no available data about historic energy use or emissions from self-implemented interventions. However, these interventions have a similar setup and similar type of emissions. In 2022 the first CO2 footprint reports were submitted by the self-implemented intervention in Libya. Data from this intervention were used as a baseline to calculate estimated CO2 emissions in relation to annual turnover for self-implemented interventions.

1999-2021 (high uncertainty)
Data: Annual turnover for activities related to humanitarian mine action.

Emission calculation: Average CO2/intervention turnover based on average calculation in Libya 2021.

Calculation of the historic responsibility

Based on the above calculations, the historic emissions of DCA activities are estimated to be 165,000 tons CO2. As noted above, this amount is not an exact number, but it is a realistic estimate based on available data.

All calculations are presented in annex 1.