CHANGING LIVES

CLIMATE CHANGE IN THE DEVELOPING WORLD

TRÓCAIRE
Working for a Just World

Cover: Nangiro Amodoi (12) driving goats near his home in the drought-prone region of Turkana, Kenya.
Photo: Ross McDonnell.

♻ Printed on recycled paper

CONTENTS

1. EXPERIENCE OF CHANGING WEATHER

1.1	Seasonal change	4
1.2	Rainfall	6
1.3	Temperature	8
1.4	Extreme weather events	10

2. IMPACTS OF CHANGING WEATHER

2.1	Agriculture & food	15
2.2	Water scarcity	18
2.3	Migration	21

3. RESPONSES

3.1	Adapting Livelihoods	24
3.2	Preparing for Disasters	26
3.3	Influencing Policy	26

4. TACKLING THE CAUSES

4.	Tackling the Causes	31

INTRODUCTION

Climate change affects everybody, but not equally. The degree to which its impacts are felt depends on people's capacity to cope with its consequences. In places where Trócaire works, people are already feeling the impacts of climate change and being forced to adapt to it. However, with limited resources and existing challenges, communities face immense struggles. For many in the developed world, climate change feels like a distant reality but for the people whose stories you will read here, climate change is a part of everyday life.

This publication is based on information collected by Trócaire and highlights how climate change is affecting our work in Africa, Asia and Latin America. The stories featured are from people experiencing the impacts of climate change first-hand and serve to illustrate, in a very real way, the scientifically established and accepted findings of climate change science. Partner organisations*, from geographically dispersed locations with vastly different natural environments, each reported very significant patterns of change. The types of changes occurring varied from place to place but an overarching trend was identifiable; weather was becoming more extreme and less predictable, with devastating knock-on effects for people in rural communities. The following statement from one of our partners in Cambodia outlines the distressing situation they find themselves in:

> **Rural communities in Cambodia are struggling to cope with the impact of worsening climatic conditions on their health and livelihoods. There is an increase in extreme weather over the last three years. Drought is affecting some districts, floods, typhoons and pests are affecting others, while some provinces have had to deal with all four types of natural disaster.**

For many communities the changes that they are experiencing are difficult to understand and they feel at a loss to know how to deal with these changes. This statement comes from Timor-Leste:

> **Many people are wondering what they might have done wrong to bring these changes in the weather. They wonder if they have offended the ancestors in some way.**

Over the years, climate change and issues of environmental injustice have been increasingly affecting the work of our partners. This booklet is about telling the stories of people experiencing climate change first hand; to share their fears, their frustrations and their exceptional resilience in the fight against a changing climate.

* Partner organisations are local organisations in the developing world which Trócaire works with and supports to advance long-term development.

1. EXPERIENCE OF CHANGING WEATHER

Children trying to make it home through flood waters, El Presidio Liberado village, El Salvador.
Photo: Kim Haughton

1. EXPERIENCE OF CHANGING WEATHER

1.1 Seasonal Change

Seasonal weather has adversely changed, with the temperatures becoming higher and higher day after the other, especially the hot months of February, August, September and October.

Caritas Meru, Kenya

Climate in El Salvador has gone crazy. From one day to the next we seem to be going from winter to summer.

Son of Dinora Urbina Avalos Romero, El Salvador

The cold season has been extended up to 5 months as opposed to when it was only three months. In Ulongwe on the contrary, summers are very hot and prolonged, i.e. from July to January or February unlike in the past when hot temperatures were only experienced from September to November.

CADECOM Mangochi, Malawi

Seasonal change is one of the most commonly experienced features of changing weather patterns reported by our partner organisations. Many countries and regions are reporting shifts in what used to be predictable, reliable seasonal patterns. In general the trend is that the timing of the seasons is shifting. Many are experiencing later onset or longer seasons, with severe disruptions to agriculture and other activities. The seasons are no longer predictable, according to most surveyed. People do not know when the rainy season or dry season will arrive; they can no longer rely on the patterns of the past.

% 90% of partners surveyed reported significant changes in seasonal weather patterns. ■

Not only are seasons becoming more unpredictable (occurring at different times or lasting different lengths of time than previously experienced), for many seasons are becoming almost unrecognisable. One of Trócaire's partners in Malawi describes how in Katema "November used to be a rainy month, but now it is dry". Similarly in El Salvador, dew that used to appear in December and January has now completely disappeared. Variability within seasons was also a feature commonly reported by our partners. Unseasonable weather, such as dry periods during the rainy season or heavy rains in the dry season are frequently experienced in the areas in which Trócaire works. The severity and variety of changes occurring in seasonal patterns across the regions Trócaire works in poses a real challenge. The following statement was given by one of Trócaire's partners in India and discusses the types of weather changes members of the community are experiencing.

Monsoon Season in India

The village of Goyalput, south Orissa is home to 28 families. The people are poor and marginalised and they depend on farming for their livelihood. They own on average 1 to 5 acres of land and Paddy (rice) and Ragi (millet) are the major crops, as well as being the staple diet of the people. They depend on the monsoon rains for their agricultural activities. Life has become gradually harder for the people of the village. They worry about the irregularity in the monsoon season, the impact of which is very evident to the villagers. Previously they could feel the onset of the monsoon by the end of April and so could plan their agricultural activities accordingly, but these days the rainy season starts by the end of June or July and agricultural activities are delayed.

According to the villagers this year the monsoon didn't begin until the end of July, and sowing and transplanting were not yet complete due to the inconsistency of the rains. Irregularity in monsoon cycles causes occasional droughts and sometimes flashfloods. Either way it affects the livelihoods of these families. People now feel that the summer season is longer and winter days have been reduced. Irregularity of the monsoon rains has not only affected crop yield but crop diversity has also been lost causing longer periods of food scarcity and further deterioration in the economic condition of the people.

1.2 Rainfall

Rainfall patterns exhibit the biggest change. Rainfall amounts are quite varied from season to season. Number of wet days are always different, start and end date is changing and distribution in the geographic area is varied.

Caritas Kitui, Kenya

Rainfall rates are becoming unstable and erratic. Numbers of rainy days are being replaced by very few heavy rain days and long dry spells. Due to cyclones, also off-season heavy rains are happening.

ORRISSA, India

The most common change reported across all regions was changing rainfall patterns. With seasons no longer displaying their traditional format, rainfall patterns have been altered significantly. For people living in semi-arid and arid regions, even small changes to rainfall patterns have serious repercussions. Reduced overall rainfall was reported by most in our survey and although official predictions place sub-Saharan Africa as the region worst affected by reduced rainfall, our partner organisations in Central America and South Asia spoke of similar trends.

More erratic rainfall patterns, with fewer rainy days and longer dry spells during the season, were reported by many of our partners, as was the later onset and/or the early finish of the rainy season. These trends all contribute to reduced overall rainfall, with a devastating impact upon the agriculture rural communities depend upon.
In many places, when much-awaited rainfall does occur it falls with such intensity and unexpectedness that it often leads to flooding, soil erosion and loss of seeds.

% 95% of partners surveyed reported significant changes in rainfall patterns. ■

Irregular Rains in Cambodia

Sop Kunny is 43 years old and lives with his wife, Peng Mon, and their four children in Doun Ouv village in Kampot Province, Cambodia. Kunny's house consists of one room with wooden walls and a palm-leaf roof. There is no electricity, and water for cooking and cleaning has to be carried from a pond 200 metres away. Kunny and his wife have two plots of farmland, located near their house, on which they grow rice. Previously, they were able to harvest 640 kilogrammes of rice in their annual yield. This was enough to feed the family and have rice to sell.

Severe floods hit their village three years ago, destroying Kunny's crops and covering his land in a thick layer of sand. The family are only beginning to recover from the floods but now find themselves struggling against yet another challenge. Kunny explains that "The weather is different to before. Now, the rains fall irregularly, so it is hard to grow or harvest the crops. Sometimes there is unusually heavy rain and flooding, and sometimes there is no rain for many months. This year, the rains came early, but stopped. Now, there is no rain even though it is still the rainy season. I don't know what to do". With food prices increasing, many men in Kunny's village wish to leave and travel to find work. So far, however, Kunny's family have persuaded him to stay.

1.3 Temperature

It is not as cool in the winter period as it was in the past. Secondly, even during the rainy season it gets abnormally hot at times unlike previously.

HARD, Sudan

Temperature changes are another aspect of changing weather patterns that are affecting communities in the developing world. The way in which temperatures are shifting varies from region to region; some are experiencing rapid increases in temperature over short periods of time while others are experiencing more gradual change.

Temperatures are becoming unbelievably extreme.

ORRISSA, India

More worrying however is the unequal distribution of temperature increases and impacts. For example, in El Salvador, the average temperature has increased by 1.88ºc over the last 46 years, compared to an average increase of 0.76ºc globally. The impacts of temperature increases are felt by the most vulnerable who, with limited access to water, sanitation and medical supplies, are commonly the worst affected by heat waves, dehydration and the increased exposure to disease that temperature rises bring.

% 76% of partners surveyed reported significant changes in temperatures. ■

Before, in the mountains one always needed a jacket, and to sleep with a blanket, but that is not necessary now through much of the year. Health impacts of hotter weather include dehydration, headaches and higher rates of malaria.

Timor-Leste

Feeling the Heat in El Salvador

"I am Eugenia Figueroa Pintin, I am 52 years old. Ten persons live here in this house with me". Eugenia Figueroa and her family live in the hamlet of El Tular, El Salvador. They live in conditions of extreme poverty. Their income does not reach one dollar a day, and there are days when they have nothing to eat. Eugenia's husband rents a small plot of land where he grows maize and sorghum, and what he harvests is used exclusively for the family's consumption.

As a consequence of hurricane Stan in November of 2005 the family had to leave their home for good. Stan caused them not only the loss of their house and the few personal belongings they had, they also lost their crops. But their troubles did not end with hurricane Stan. The variability of the climate and the problems this brings continue to affect them. Ms. Eugenia says: "You plant the maize fields and then it doesn't rain, and the soil cracks, the heat is unbearable, and all this is affecting us a lot. With this problem with the climate we are completely lost, we can't do anything. I started watering the sorghum, but I spent a whole bucketful of water on just one furrow and then it dried up because of the heat."

1.4 Extreme weather events

Droughts, floods, storms and other extreme climatic events are now common features of everyday life in many parts of the world. While this type of weather has always happened, especially in countries affected by El Niño and La Niña, the severity and frequency of these events is unprecedented. The last decade has seen a threefold increase in the number of disasters recorded compared to the 1970s. The numbers affected by these more frequent and intense disasters reflect the unequal distribution of their impact. According to the UN, of the 262 million people affected by climate disasters between 2000 and 2004, 98% were in the developing world. The changing nature these events were reflected on by our partners:

> **In the last twelve years the frequency of tropical storms and hurricanes has doubled.**
>
> El Salvador

> **Unprecedented floods and cyclones [are] claiming lives and destroying natural habitats.**
>
> ORRISSA, India

More frequent and intense droughts are affecting 62% of the communities we work with. Some are reporting drought in places that previously never experienced drought. For many communities the frequency with which this is occurring is leaving them little to no time to recover from one period of drought to the next. The impact of drought is particularly pertinent for the communities Trócaire works with, the majority of whom are farmers depending on rainfed agriculture.

Living with Drought in Cambodia

Seng Thep is 32 years old and lives in the village of Snay Anhchet, which is located in Kampot Province in Cambodia. Thep's husband passed away four years ago having contracted HIV/AIDS. Thep, who contracted HIV/AIDS from her husband, lives with her three children and is responsible for caring for her children and for earning an income to feed her family. Thep says "Since my husband died, I have struggled to support my children, because they are too young to work or help me". Thep has three small paddyfields in which she grows rice during the rainy season. After harvesting the rice, and assuming that there is water remaining, she grows vegetables. During the dry season, Thep purchases small cakes in nearby Chhuk town, which she resells in her village. She also keeps two cows and some chickens.

In recent years, life has become more difficult for Thep and her family. Dry spells and drought have become more common, and rainfall patterns irregular. Thep recalls, "Years ago, the rice fields were full of water in July and August and I was able to start planting at that time. But now, there is little rain and heavy winds, and I cannot plant until later in the year". Previously, Thep was able to harvest an annual rice yield of roughly 510 kilogrammes. Recently, however, due to the lack of rain, she has only been able to harvest in the region of 250 kilogrammes. This amount is insufficient to provide for her family's needs, let alone enough to sell to earn money. Drought has affected the vast majority of people in Thep's village. According to Khieuv Lim, the 62-year-old village chief, "It is very difficult to survive if there is no rain, because people depend on the rain to farm. So, if families cannot farm, they are forced to carry out illegal logging or to travel outside the village to find work". Rising food prices, especially rice and vegetables, is also leading to increased difficulties for people in Thep's village.

The regularity and severity of flooding in recent years is placing an extra burden upon the poor and vulnerable in the developing world. For the people Trócaire works with, living in poverty and surviving on small-scale agriculture, being more vulnerable to flooding as a result of climate change is pushing them over the edge. In many areas drought persists for months only to give way to flooding on an unprecedented scale, destroying crops, homes and livestock. The cyclical pattern of drought and flooding is eroding the capacity of communities to build up secure livelihoods.

"Our ancestors told us that floods were a good sign..."

Laurinda Muletche lives in a village called Mavinga in central Mozambique. She is not sure of her age but she thinks she is around 80 years old. Her husband passed away several years ago. She lives with her son, daughter-in-law, and four grandchildren in a typical mud hut with a palm thatched roof. Most people in Mavinga live from subsistence agriculture. Laurinda's family has a more precarious livelihood than others in the community. For the past 13 years, Laurinda has been too weak to work and no one in the family has engaged in agriculture this season. They survive thanks to food given to them by relatives.

The impacts of climate change are felt by everyone in Mavinga. Rains are more irregular and floods are more severe. This year floods occurred twice, much more frequently than in the past, and many families in the community lost their crops. According to Laurinda, in the past it was very different. She says "Our ancestors told us that floods were a good sign, a sign that there would be a good harvest that year. Now in recent years, floods only bring misery. We don't know why this has changed. We lack the explanation."

When the floods came early this year families in Mavinga left their homes to go to higher ground. When the waters receded, they returned and replanted, taking advantage of the moisture in the soil. When the crops had grown to almost half a metre, there was no more rain although it was still the rainy season, and the crops dried up. Dry spells and drought are serious problems and have become more common. The rains are less regular than in the past. "When the rains start, people plant their seeds. But one rain is not enough. It has to keep raining for the crops to grow. We used to have two planting seasons, but now the second one almost doesn't exist."

Much like the changing patterns of flooding and drought, our partner organisations reported an increase in the frequency and intensity of storms. Each year tropical storms and hurricanes cause huge damage throughout the developing world, severely affecting the lives of the most vulnerable. Communities least able to cope frequently lose lives, homes and livelihoods. The increasing threat of storms is affecting many of the regions where Trócaire works. The following are statements from our partners about the changing situation:

% 57% of our partner organisations reported a significant change in the patterns of storms ■

> **The country is affected by between 3 and 6 tropical storms and 1 and 2 hurricanes a year.**
>
> El Salvador

> **Frequent storms are normal these days as well as the intensity of its effects.**
>
> ORRISSA, India

> **The frequency of storms has increased nationally and remained the same regionally while intensity is always changing from season to season.**
>
> Caritas Kitui, Kenya

2. IMPACTS OF CHANGING WEATHER

Failed millet crop (right) from the Ngera family's farm in Kenya.
Photo: Ross McDonnell.

2. IMPACTS OF CHANGING WEATHER

2.1 Agriculture & food

As food production is severely affected by the change in the seasons, the majority of small and marginal farm families hardly get three to six months food from their farming in a given year.

ORRISSA, India

Before farmers could sometimes plant crops 2-3 times in a year but now it is possible to get only one crop.

Timor-Leste

There has been [a] strong impact on agriculture and people's livelihoods, since about 80% of the Cambodian population are relying on agriculture for their livelihoods.

NGO Forum, Cambodia

Even small changes in weather patterns brings with it severe implications for the livelihoods of the rural poor. For many of the communities Trócaire works with, the impact of climate change is most heavily brought to bear on agriculture. Changing weather means changing agricultural activities but the level of uncertainty and unpredictability that now surrounds weather patterns makes it difficult to know how best to respond. Our partner organisations and communities we work with have told us that planting times, growing seasons and harvesting times have all been disrupted by changes in the weather. Planting times are harder to predict and overall, farmers seem to be planting later in the year, either because they have delayed planting to wait for the rains to arrive or because their first attempts failed and they have had to replant.

Changing Seeds in Sudan

Akol Aluk Madut is a farmer from Rakbak village in South Sudan. As a farmer primarily, Akol lives and cultivates on a low lying area locally known as 'pathic'. This area is known for its ability to cultivate long term sorghum (due to the water retention capability of the area). Akol has been growing long term sorghum for ten years, however, gradually, he began to notice that not only was the rainfall pattern changing, there were also changes to the durations of the 'flooding' in the pathic, which is necessary for the maturation of the long term sorghum.

A 49 year old father of 7, Akol has had to change from cultivating long term sorghum to the short term variety, to ensure that his family has some food and doesn't go hungry. While short term sorghum is an alternative, long term sorghum allowed households to store grain to last them through hungry periods, due to the fact that it is harvested so much later in the year. Akol is unsure as to whether he will be able to sufficiently provide for his family cultivating only short term sorghum.

He may have to depend on selling labour or firewood or on food aid, which have been some of the ways he and his family have coped in the past.

In some years rainfall is extending beyond the harvesting period, while in other years the rains have stopped before the growing period is finished. So the growing season keeps changing – sometimes it is too long and other times it is too short.

CADECOM Mangochi, Malawi

Later planting times expose farmers to more risks. The growing season can be significantly shortened by planting later and the harvest is more at risk due to unfavourable weather later in the year. Several partners, such as those in El Salvador, India, Liberia and Kenya reported decay and rot of the crops because of too much or too little rainfall occurring at the wrong time of the season.

Food scarcity in Kenya

Silas Ngera is 38 years old and lives with his wife and 3 daughters in Tharaka, near Mount Kenya in Kenya. He has been farming for the past 20 years and has noticed considerable changes in the weather and his harvests over this time. Decreasing rainfall has badly affected his crops and this year the Ngera farm produced nothing at all. The millet crop failed due to the poor rains and although Silas plans to replant again later in the year, he knows there is a risk that the rains will not arrive again.

The family depends on their plot of land to provide them with a good harvest and enough food for the year; without rain, they have nothing. Their food supplies for this year have already run out. They have a small number of goats which they can sell to buy food but even this offers little support. At times of drought, the prices for animals go down so even though Silas may earn 1,500 shillings for a goat, a bag of maize will cost him 2,000. He also worries about what will happen next year if the harvests fail again and they have no more goats to sell. The family's future is now very uncertain as a result of the changing weather and inconsistent rains.

Sometimes we are forced to delay planting time awaiting rainfall onset and then the season may become too short for adequate crop growth. Other times you plant early and very little rain falls. It causes seeds to rot in the soil and this means a loss of investment in terms of seeds and labour.

Caritas Kitui, Kenya

Changes in the weather are not only affecting farmers' activities but also the materials essential for productive agriculture – soil and seeds. Heavier rains cause soil erosion, often washing away the fertile topsoil, and drier, hotter conditions affect the activity of micro-organisms and water absorption of the soil. Reduced soil quality was reported by 67% of our partners surveyed. The changing weather also poses a serious threat to crop varieties. More farmers are moving to drought resistant or short-term seeds because the weather doesn't permit lengthy growing seasons. While not a problematic practice in itself, reducing the variety of seeds used can have negative impacts on crop diversity, food availability and nutrition.

Shorter growing seasons, later planting times and poorer soil quality result in reduced crop yields and food availability. In our survey, 86% of those who responded felt that the changes in climate affecting agriculture were resulting in more food scarcity. Reduced yields not only cause more hunger but also push people deeper into poverty as coping mechanisms, such as selling assets to pay for food or taking children out of education to help at home, come to the fore.

2.2 Water Scarcity

Rivers dry up due to drought and prolonged drier season. Wells dry up. Everyone is affected in one way or another.

CADECOM Mangochi, Malawi

Water availability has been severely compromised by the impacts of climate change. It is estimated that 41% of the world's population live in water stressed regions and with the combination of reduced overall rainfall and increased temperatures, this figure is set to increase. For rural communities, access to water is essential for sustaining livelihoods; farmers need water to irrigate their land and

pastoralists need it to maintain their livestock. Water shortages and changes in the availability of water are increasingly affecting these communities. Reduced quantity and quality of water are the main trends being experienced by communities due to declining water levels, or in some cases the complete drying up, of traditional water sources and increasing contamination of water sources.

> **Quantity and quality of water available has reduced. 20 years ago [the] water table used to be 6 meters down, now it is as deep as 30 meters down in some places. Water has become inaccessible to many. Water has become scarce in the community, and the few hand pumps available are a source of conflict among the community and animals.**
>
> APARD, Sudan

Reduced water availability affects in various ways the everyday lives of the rural poor in the developing world. Agriculture is of course highly dependent on water and therefore suffers when water is in short supply, but a less obvious impact is the extra burden that changes to water supply can impose. Almost all respondents reported more time being spent collecting water due to the fact that people, mostly women and children, have to travel further to find available water. More time committed to collecting water means less time engaged in livelihood activities or education. A number of partners also spoke of the increased risk of violence towards women related to collecting water further away. Also, as touched upon above, a number of partners reported that the quality of water was disimproving, with an obvious impact upon health. Cases of illness stemming from waterborne diseases are becoming more common, and overall sanitation is getting worse as a result of reduced water availability.

Access to water is fundamental to peoples' lives and livelihoods, however of our partners surveyed, 90% identified water availability being reduced by changes in the climate, with women disproportionately affected by these changes. In the developing world, women and girls bear the primary responsibility for collecting water for domestic use. The extra burden faced by women when water is in scarce supply is exacerbated by the impact of climate change. More drought means women are forced to travel much longer distances to find water, very often at great risk to their own personal safety. They frequently walk for miles, only to spend hours queuing at the water source, before making the long journey home again and beginning their daily routine household chores.

Water stress in Bolivia

Daniel Puma Cruz is 24 years old. He is a farmer and a builder and lives in the community of Tambalilla with his wife Aquilina Ajchura (21) and their three children, all under 4 years of age. Tambalilla is a small and remote agricultural community which recently started producing peaches. All the harvests are poor however due to the scarcity of water; peach plants, vegetables, potatoes, corn and wheat depend on the rains from the rainy season. Much of the population, especially young people, has migrated away from the community as a result.

The community faces many challenges as a result of the constant changes in the climate. The rains fall at the wrong time of the year, there is intense cold and frost, unbearable heat, hailstones and rainstorms that cause flooding and soil erosion. At the same time there is little water for irrigation. Daniel explains the situation: “This year I harvested 8 kilos. Before, when it rained, we’d sow 2-3 kilos and that would yield 15-20 kilos; but with the scarcity of rain now and the changes in the climate, sometimes we lose the entire harvest, we can’t even recover new seeds.” About the rain he says “one minute it rains and the next it stops, it rains too early or too late in the year, the rain pattern is out of sync with the land and the growing season.” Due to these changes in the climate it’s no longer possible for Daniel to plant in as big an area as before – the land has become exhausted as a result of the lack of irrigation. It’s now better he sows only half the amount of seeds, enough to produce for family consumption and to recover new seeds for planting the following year.

Daniel and his family also keep animals – goats, sheep, donkeys and hens – but with this they also run into difficulties. There isn’t enough water for the animals throughout the year. Daniel says “we have to take the animals a long way to find water, depending on the distance of the houses, you walk an average of 2 km”. About the water shortages he says “there’s only a tiny amount of water for irrigation, there are different areas to irrigate, the little water that there is gets used up… what can we do. This situation is unbelievable. Before there was plenty of water, now I don’t know what’s happening”.

The shortening of the rainy season means water has become a scarce commodity. In some instances, people fight over the few available water points such as rivers. People also clash at boreholes when cattlekeepers take their livestock to water, while the rest need to fetch water for domestic use.

HARD, Sudan

Stresses around resources such as land, increasing food prices and environmental destruction were reported by our partners but the most pressing concern and the one causing the most unrest was water. Tensions between farmers and pastoralists, between civil society and the state and/or corporations and within communities were recognised as sites of conflict.

Conflict is arising over scarce water supplies. Before there were traditional processes which governed how people shared resources. Now, with a lack of water these processes are breaking down. There are situations of people stealing water at night-time… localised conflicts such as this could be the start of larger conflicts.

Timor-Leste

At many places shortages of water also resulted in public protests, sometimes violent protests against the government and corporate bodies.

ORRISSA, India

2.3 Migration

Climate change is wreaking havoc with the agricultural processes and activities so many of the rural poor in the developing world rely on. With limited alternative sources of income generation, many are turning to migration as a path out of poverty. However migration rarely ends the cycle of poverty and often serves only to deepen it. Among our partners surveyed, over half reported that climate change was affecting patterns of migration. Declining agricultural productivity and constrained livelihoods leaves families struggling to feed themselves – let alone produce enough to sell on and earn some income – therefore migration is seen as the best, and often the only, alternative.

Most highlighted that migration fed into the cycle of poverty; migration drains rural communities of their capacity as young people, mostly men, leave to seek work in urban areas. Abandoned land and farms lie fallow, becoming increasingly unproductive, leading to further poverty and vulnerability in the community, while the prevalence of HIV/AIDS often increases as migrants return home to their families from long periods of work in cities and towns.

> **Climate change has generally contributed to poverty, and poverty has led to massive migration to urban centres to unprecedented levels, and the civic authorities have not been able to cope with the demand for services. Neither have the urban centres provided adequate employment.**
>
> CADECOM Mangochi, Malawi

Equally as damaging, in areas experiencing mass immigration, resources are put under severe strain to cope with the levels of demand. As one of our partners pointed out:

> **[M]igrants are increasing in numbers in the villages and towns. We are consuming our natural resources at an outstanding pace and we feel threatened.**
>
> APARD, Sudan

Many of the families Trócaire works with are managing to survive without family members needing to migrate. Sop Kunny from Cambodia, who was struggling to support his family due to poor harvests as a result of inconsistent rains, has so far been able to remain at home with this family, while other men in his village have left to seek work in the towns and cities. The same fate may face Kunny in the future. For Daniel Puma Cruz from Bolivia this reality has already occurred. We saw above how changing weather patterns were creating water scarcity and threatening his farming as a result. He told us:

> **There's nothing to be gained here, I talked with my wife and we decided that I'll have to go to Argentina or Cochabamba, if we could harvest anything here there wouldn't be a need to travel.**

3. RESPONSES

Sofía Aguilar Calla sows belts to earn an income. Changes to the climate in Bolivia mean her family can no longer survive on farming alone.

3. RESPONSES

As we have seen, climate change is having a devastating impact on the lives of the poorest in the developing world. Advances made by people trying to find their way out of poverty are constantly being undermined by the aggressive consequences of climate change. However, in the face of this immense challenge, people are finding ways of coping. Exceptional resilience and determination to overcome and survive what is so frequently termed the 'biggest threat facing humanity' is being displayed by households and communities across the developing world.

Adaptation is about finding responses that increase the ability of people to manage or cope with the impacts of climate change. Trócaire and our partner organisations are working with communities affected by climate change to find ways of maintaining their lives and livelihoods in an unpredictable environment. At a practical level, this means supporting rural communities to find new ways to farm, or different ways to earn a living, and ensuring communities prone to extreme weather are prepared if a storm or flood hits. Trócaire also works with and lobbies national and international decision-makers for policies that protect the poor in the face of climate change.

3.1 Adapting Livelihoods

Rural communities in the developing world have been adapting to changes in the climate for some time. For most farmers it is the changing patterns of rainfall that have had the most destructive effect on their work. In order to protect themselves against the worst effects of these changes, many have had to alter the way they farm. New techniques, such as the introduction of drought-resistant crops, along with small-scale irrigation, water harvesting and improved soil management are helping to limit the negative impact of reduced rainfall on farmers' yields. Diversifying the crops they grow is bolstering farmers' resilience to potential crop failure, as they are not relying solely on one crop type. Other methods of income generation, such as rearing small livestock or beekeeping or finding off-farm opportunities, have also been employed as coping mechanisms in the face of a changing climate and a more uncertain livelihood from agriculture.

Sonu stops Migrating

Sonu Sisa and his family live in rural Orissa, India and have lived with the effects of poverty, food scarcity and the impacts of climate change for some time. His family consists of his wife Kuji Sisa, three daughters, three sons and his mother. The family owns 3 acres of land which they are dependent on for their livelihood. They used to grow Paddy (rice), Ragi (millet), and niger (a kind of edible oil seed), depending on monsoon rains for raising crops. The harvest they got supported the consumption needs of the family for 8 to 9 months. For the rest of the year Sonu had to migrate for wage employment to support his family. However life in their village has started to improve in the last few years. Trócaire supported the installation of a water lift point in 2006 to supply the community with water for irrigation. Since then Sonu, like the other families in the village, has been growing different vegetables such as onion, garlic, potato, brinjal, tomato and other seasonal vegetables throughout the year.

He has also established a compost unit which he uses to improve the quality of the soil and therefore the yield from his crops. There have been visible changes in the standard of living of the family. They are now able to consume vegetables throughout the year, along with their regular diet of rice and Ragi. This was not possible before as they neither produced vegetables nor had the money to buy them. Besides consumption for his family, he sells the vegetables and earns an average of Rs 3000/to 5000/- (€50 to €80) per season. Sonu has been able to invest some of this to construct a new house for his son. Last year, he was able to spend Rs 1500/on his daughter's marriage. Now he is sending three of his children to school and can afford to support their education. He has decided to send his son for higher education as he passed matriculation. The family is now able to earn a livelihood in the village and Sonu has stopped migrating.

3.2 Preparing for Disasters

As disasters and extreme weather events become a more common feature of everyday life the need to address their impact is urgent. Hurricanes, floods and droughts may be inevitable in many regions of the world but the extent of the damage they cause is not. Many of the worst impacts, which disproportionately affect the poorest, such as loss of life through poor housing, can be overcome with appropriate support. Trócaire is working with vulnerable communities to identify the risks they face and design plans for their community to cope with the impacts of extreme weather events and disasters. Interventions such as resource management, weather-appropriate agricultural practices, building up non-farm assets, reforestation and improved coastal protection help to reduce people's exposure to disasters when they strike. Initiatives such as community emergency plans, early warning systems and constructing drainage channels help communities to be better prepared for, and therefore better able to cope, once a disaster hits.

3.3 Influencing Policy

For people to adequately adapt to the consequences of climate change, their voice has to be heard by those in power. People have a huge rule to play in insisting that governments and the international community put the necessary policies in place that protect and support the needs of the poorest. Trócaire is supporting communities to work with municipal governments to ensure that local-level plans for coping with climate change take into account the needs of those worst affected. At a national level, our partners are working to ensure that the priorities of the poor are included in government plans for adapting to climate change. Internationally, Trócaire and our partners are lobbying governments to agree on a plan that will deal fairly with those responsible for climate change and those most vulnerable to its impacts.

Working together to Cope with Disasters

Dinora Urbina Avalos Romero is 40 years old and comes from the Canton of La Breña, El Salvador. Dinora's husband was killed during the war and she is the head of a household of nine people: six of her eight children, her 70-year old mother and a grandchild aged nine months. Dinora grows grains, maize and beans on a small plot of land she owns. However intense drought and flooding is causing the community a lot of problems in recent years. Dinora and other families lost much of their crop last year. She says "I am a woman on my own, head of the household, and I am very worried about all these climate changes that are taking place because the economic situation is getting worse all the time".

Despite the challenges, Dinora is a very active person and very committed to her community. With the support of Trócaire, Dinora's community has received training and they have identified a number of priority areas of activity that will improve their situation, including protection of the environment, improvement of agriculture, and preparation for disasters. She says: "One of the main challenges our community faces is preventing the environment from continuing to deteriorate; to that end, we must continue to plant more trees, avoid burning on our plots, and take better care of the sources of water we have." More recently, the community has started planning for disasters. They have been receiving training in this topics and intend to create a committee and to draw up a plan that will allow them to respond better to possible disasters. Finally, they have also begun to address the problem of droughts and excessive rains that result in the permanent loss of their crops. Access to credit for buying seeds and other supplies and technical advice will support them to do this. Dinora is conscious of the fact that the climate has changed lately and that these changes are affecting the community but she says that she has "not lost hope that our lives can improve, and I know that we can reach that goal through the participation of everyone in the community together".

Demanding justice in El Salvador

Evangelina González de Marías, 59 years old, lives in the community of San José with her husband, three children and a grandson aged 4. They earn their living from farming and when they can they sell their labour in local large private farms. They face many challenges relating to changing weather patterns. Droughts and floods are regular occurrences, as well as increasing heat and more frequent storms. In the past few years, the problem of access to water has become more acute in the community of San José. There are severe water shortages due to the fact that droughts are more frequent and longer now, and also as a result of deforestation occurring in the area.

Evangelina takes part in her community organisation and is a member of the Environmentalist Network in Action (Red Ambientalista en Acción). This is a nationwide grassroots organisation that lobbies municipal governments, the central government, and private enterprises to promote adequate policies and laws for the protection of the environment, for fair and equitable use of the natural resources, especially water, and for the prevention and attention to disasters. The communities that belong to this network have become familiar with the problem of climate change and its impact on the life of the country and its communities, as well as how to face it, mitigate against it, and become more adaptable to it. In the past 10 years Evangelina's community has fought for the removal of a number of companies that were causing environmental problems in the area. One of the companies which they were successful in removing was carrying out largescale deforestation in the area and affecting the water volume of the nearby rivers, making them more vulnerable to the effects of climate change.

For Evangelina it is very important to be part of the Environmentalist Network in Action and participate actively in it. About her participation in the network she says: "One enjoys everyone's support… we are all very attentive to one another and, additionally, we are all together in the fight for our rights and to defend nature". The communities' success in stopping companies' destructive activities has confirmed for Evangelina that the only solution to confronting and overcoming the problems that make them more vulnerable to climate change is the organisation and participation of the communities affected.

In conjunction to finding ways of adapting to the impacts of climate change, Trócaire is seeking to support greener alternatives by using innovative technologies in our programmes. People in the developing world have contributed least to the causes of climate change and are therefore least obliged to reduce their emissions. However the use of greener technologies not only reduces the level of greenhouse gases emitted but can also bring various additional advantages, such as being more sustainable, economically efficient and better for health.

Solar Lamps for Uganda

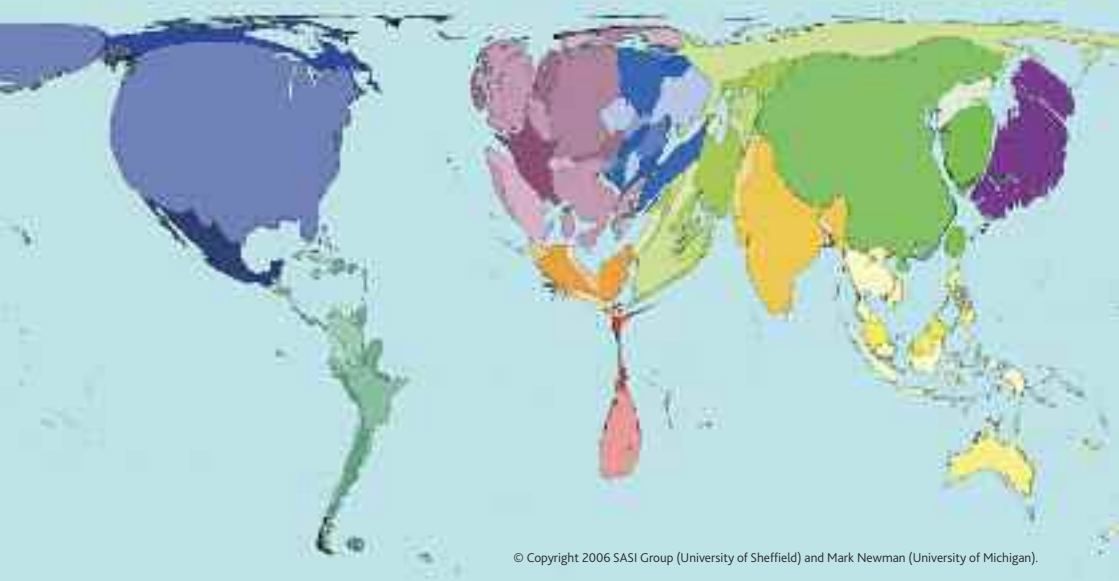
Photo: Gary Moore

In the northern district of Pader, Uganda, many people living in camps are getting ready to return home after being displaced by years of conflict. For one family, this is a time of excitement but also trepidation. Marianna Lamunu, John Ochan and their five children are hoping to return to their homeland in December, when the grass grows. They are living with HIV/AIDS and are anxious about whether they will be able to access medicine once they return home.

If they cannot they will become weak and John fears he will not be able to farm their land and that this will have a knock-on effect on his children's education. Bosco (14) is their middle son and attends a local school everyday from 7am to 5pm. His favorite subject is social studies. At the moment he finds it very difficult to do his homework once night fall arrives. He uses a paraffin oil lamp in his hut which creates smoke and does not offer much light. These lamps cost 500 shillings (.22 cent) to fill, and they need to be re-filled 3-4 days each week. Bosco explained that it smokes a lot and he can only use it for short periods of time, as he finds it difficult to see his books.

Trócaire is providing Bosco, and other families like his, with solar lamps. These lamps, once left in the sun for four hours to charge, provide 4-6 hours of bright, smokeless light.

By providing small supports such as this to Bosco, and many others in his situation, barriers that stand in the way of continuing education can be overcome.



© Copyright 2006 SASI Group (University of Sheffield) and Mark Newman (University of Michigan).

4. TACKLING THE CAUSES

Territory size reflects the proportion of carbon dioxide emissions from there in 2003.

4. TACKLING THE CAUSES

Developed and industrialised countries must reduce the level of greenhouse gas emissions thus reducing the level of pollution.

APARD, Sudan

Industrialised countries with their energy intensive lifestyle are historically responsible for the problem of global warming.
The atmosphere is a common property resource to which every human being has an equal right and it is now the turn of developing countries to demand appropriate 'environmental space' for their future economic growth. Moreover, the maximum impact of global warming will be borne by developing countries like India, which have hardly contributed to the problem.

SOVA, India

All human beings and their activities are responsible, but the greater responsibility goes to the developed world where the contributing factors are higher and on a daily basis.

IRDO, Liberia

The previous section highlighted the resilience people living in poverty display in the face of the challenges posed by climate change. With temperatures not predicted to peak until 2050, even assuming rigorous mitigation measures are adopted, future scenarios are set to be even more challenging. As a result of this, the UN has stated that for the first half of the 21st Century there is no option but to adapt to climate change. However, there are limits to what people can adapt to. For this reason it is urgent to prevent as much of the future impacts of climate change as possible. This requires, as many of our partners identified in the survey, developed countries to dramatically reduce emissions of greenhouse gases – the main cause of climate change. For this reason, while also supporting adaptation projects on the ground,

Trócaire is working to ensure that responsibility and appropriate action be taken at the international level. The views expressed by partners in our survey suggest that the international community is failing to do enough to equitably tackle the causes and consequences of climate change:

> **Politicians at all levels are expressing increasing interest and concern for environmental issues, unfortunately the concern is not always matched by appropriate actions.**
>
> APARD, Sudan

Trócaire is engaging with the Irish government, the EU and the UNFCCC process to seek a just response to how climate change is dealt with.
In particular, Trócaire is calling for:

1. **An equitable international agreement that will keep global temperatures to as far below 2°C as possible by ensuring rich countries, in light of their historic responsibility, reduce their greenhouse gas emissions by 80%-95% below 1990 levels by 2050.**

2. **That, cognisant of equity and their historic responsibility, rich countries should lead on mitigating the causes of climate change.**

3. **That adequate, accessible and predictable finance for adaptation be provided to developing countries as a form of compensation for damages caused by developed countries and as additional to Official Development Assistance.**

Trócaire will continue to demand climate justice from the international community and seek to ensure communities worst affected by climate change are more resilient and better able to cope with the consequences so that our overall aim of reducing poverty and having a just and sustainable world for all are not undermined by the challenge that climate change presents.

TRÓCAIRE
Working for a Just World

Head Office: Maynooth, Co. Kildare, Tel. +353 1 6293333
Dublin Office: 12 Cathedral Street, Dublin 1, Tel. +353 1 8743875
Cork Office: 9 Cook Street, Cork, Tel. +353 21 4275622
Northern Ireland Office: 50 King Street, Belfast. BT1 6AD, Tel. +44 28 90808030

www.trocaire.org