



A

INTERNATIONAL
ROCHA

Conservation and Hope



CLIMATE CHANGE

SOUTH AFRICA: Adapting to water scarcity

CLIMATE STEWARDS: Reduce your carbon footprint

NIGERIA: Adjusting to irregular rainfall

INDIA: Changing farming methods

KENYA: Farming God's way

AUSTRALIA: Challenging a climate of greed

GLOBAL: Taking care of the oceans

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GET INVOLVED: Climate change appeal



Editorial

As the planet warms, heat waves become stronger. Heavy precipitation gets more frequent and hurricanes become more intense. Scientists release another doom-filled report and politicians push back, often repeating the same science-sounding myths. What can we do about it?

The number one thing we can do is what most of us aren't doing: talk about climate change! Not by reeling off a long list of facts or figures, though - rather, by connecting the issue directly to what we already care about.

As a Christian, I believe that God created this incredible planet that we live on and gave us responsibility over every living thing on it. I believe we are to care for and love the least fortunate among us, including those who are already suffering the impacts of poverty, hunger, disease and more; the very people who are most affected by a changing climate.

No matter where we live, climate change is already affecting us. We need to recognize what is at stake, but we also need a vision of a better future; a future where all of God's people can live in safety, in harmony with creation, and with ample and affordable access to food, water and the basic resources they need to support their families.

Over the following pages, you will read about A Rocha's people around the world and how they have observed the impacts of a changing climate where they live and work. You will see how your support and donations have enabled teams to bring hope and create meaningful solutions in their communities. This work shows how, by working together, we can start to fix this. And that begins with a conversation today.

Katharine Hayhoe is an atmospheric scientist and professor of political science at Texas Tech University, where she is Director of the Climate Science Center.

Defeating Day Zero climate change and water scarcity

'I have lived most of my life in Cape Town, a city of great natural beauty but also of significant inequality and environmental vulnerability. South Africa is a climate change hotspot that will be further impacted in the coming decades by heatwaves, prolonged droughts, flooding and sea-level rise.

The recent severe drought in the winter rainfall areas of the Western Cape province may be a foretaste of what is to come. Last summer, following three years of below-average rainfall, almost all municipalities in the province were placed under severe water restrictions.

The City of Cape Town limited each of its four million residents to 50 litres per day to avert 'Day Zero', the projected date when Cape Town would become the first major city worldwide to run out of water. This news prompted panic buying of rainwater tanks, containers and bottled water. The City also initiated several water augmentation strategies and public campaigns to promote water efficiency.



(James Irlam)

Our household of five responded by reducing our water consumption to less than the 50 litre target (our best was 29 litres) by capturing rainwater and grey water to use for flushing toilets and watering the garden, and by reducing the frequency of showers, toilet flushes and washing of clothes and dishes.

Like most Capetonians, we came to appreciate our precious water resources more and to waste them less. Although the immediate crisis may have passed for now, attitudes to water have changed forever and the City will be better prepared as it faces an uncertain climate future.'

James Irlam has led the A Rocha group at Rosebank Methodist Church since 2008.

The South Africa team relies on a dedicated group of volunteers who engage local churches and communities in Cape Town and Pietermaritzburg in caring for creation.

For example, when a church became aware of the violent crime affecting pedestrians using an inner-city park, they approached A Rocha South Africa for help to clear rubbish and invasive plants from the site. **Thanks to your support**, the park is now a clean and safer environment. You have helped reduce crime and create a haven for wildlife and birds within the city. As an inner-city park on a major river, the site also offers possibilities for environmental education in urban greening, water quality and pollution awareness.

Reduce what you can and offset the rest

Perhaps like James Irlam and his family, you've made changes to improve your household's sustainability. Well done! No matter what your situation, there's still more you can do.

'By offsetting your unavoidable carbon emissions with Climate Stewards, A Rocha's carbon offsetting partner, you will be supporting projects which remove or reduce CO2 in the atmosphere, as well as bring tangible benefits to local communities in the developing world,' says Caroline Pomeroy, Director of Climate Stewards. 'You might be surprised to find that it doesn't cost the earth to offset. It's a great way of both acknowledging our impact on the planet and helping our poorest global neighbours adapt to the impacts of climate change.'

Climate Stewards supports a range of A Rocha projects. In Ghana, we've helped plant more than 100 hectares with indigenous trees and supported school environment clubs, educating the next generation to care for creation.

We also work with other organizations. In Mexico we support smallholder farmers to protect and restore their forests. And this year, we're introducing fuel efficient cookstoves in Nepal.'



In Uganda, Climate Stewards funds bio-sand filters which remove the need to boil water, saving money and reducing pressure on remaining forests at risk of being cut down to make charcoal (Adrian Frost)



Climate Stewards

climatestewards.org

Work out your own carbon footprint and look for ways to reduce it. Offset the rest with Climate Stewards. Check out the resources on our website for engaging your church or employer too.



Supporting smallholders in Mexico (Climate Stewards)

Farming in a changing climate

Adapting to irregular rainfall in Nigeria

'When I met with farmers at one of EDEN's agriculture workshops, we traded stories and shared our observations of a shift in rainfall duration and pattern over the past decade.

Growing up in Jos, I was accustomed to rain beginning in April and lasting until the end of September. October would bring dry air and dust while the Harmattan cold would hit in early December.

But over the last decade, I've noticed rains are coming later, with erratic downpours starting in May. The rains last until mid-October, delivering the six months of rainfall typical of drier regions in the north. Along with increases in temperatures, the dryness of the atmosphere and low relative humidity have meant farmers have needed to increase cultivation of their land and watering of their crops.

These experiences have led us to encourage farmers to use environmentally-friendly methods like mulching their land with

crop stalks rather than removing them at harvest to be used as wood fuel at home. Mulching is part of Farming God's Way which teaches farmers how to care for their environment whilst increasing crop yields, locking carbon into soil and reducing soil erosion.

Along with changes to rainfall duration, we've also observed that rain arrives as heavy, torrential downpours. This caused three out of 11 ponds at our Rennajj fish farm to overflow, leading to soil erosion.

So we introduced underground tunnels and structures to connect the ponds to direct overflowing water into a connecting pond, enabling us to regulate the volume of water and prevent flooding.

We hope to buy a weather station device which will alert us in advance of heavy downpours. This will help us to regulate the water volume in each pond, resulting in less flooding and soil erosion.'



Chioma Immaculate Okafor, National Coordinator of Eden Creation Care Initiative, A Rocha's Associated Project in Nigeria



(Tony Hisgett (CC BY 2.0))

Two ponds at Rennajj Fish Farm. The pond with vegetation is a good breeding site for Little Grebes *Tachybaptus ruficollis* and White-faced Whistling ducks *Dendrocygna viduata* (Jeremy Lindsell)

Paddy to Ragi – shifting farming practices in India



Ragi or Finger Millet
Eleusine coracana
(Mel Ong)

'With over 58% of the population dependent on agriculture for its livelihood, India is considered one of the countries most vulnerable to climate change. As a nation we are witnessing extreme weather events such as floods, droughts and cyclones.

At Bannerghatta, where A Rocha works, farmers are experiencing less drastic but nonetheless devastating events such as irregular rainfall. This has a direct impact on our large agricultural community, as all of the farming practices are monsoon-dependent. Over the past three years we have encouraged a

Farming God's Way brings hope to farmers in Kenya

'It's August 2018 in Nakuru, Kenya, and an extended family meeting is taking place. Relatives who have not seen each other for years gather at one house to bond over food and drink and swap stories. With the majority of guests coming from different parts of the country, there is usually an abundance of many different food gifts given to the host family.

But not this year. Few manage to bring produce from their harvest after the long rain season. The most impressive contribution is a bag of potatoes.

As neighbours join in to help cook meals for the guests, they cannot help but ask, 'Who brought the potatoes?' They cannot understand how someone could afford to bring potatoes.

The story is the same across the country, with farmers describing the destruction the long rains brought upon their farms, with most of the crop either washed away or damaged by waterlogged soils.

The long rains expected between April and June have become heavier, causing both floods and crop damage, while the short rains expected between October and



Sosoni Farmers Group (Sarah Young)

December are too scant, making it hard to farm before the dry season between January and March.

The farmers agree there has been a change but the majority of them are not aware why the weather patterns are changing. They worry how they can keep farming with unpredictable and unreliable weather.

A small minority of farmers has started to use conservation agriculture, such as Farming God's Way, but the majority has opted to use fertilizers in a bid to increase their yields. They do not understand why they need to change their farming methods because they do not know about global warming or how it has led to climate change.'

Monicah Njambi, Communications Officer, A Rocha Kenya



(Sarah Young)

A Rocha Kenya is introducing Farming God's Way to farmers in Dakatcha Woodland. **With your support**, community members have access to an alternative source of income that is good for the soil and biodiversity.

In the village of Sosoni, farmers have been practicing Farming God's Way for three years, and the difference it makes is already evident. Because mulching retains moisture, they can water less frequently – only three times per week – which saves precious water resources and time. Mulching also reduces weeds and increases the fertility of the soil. Now, the average harvest has more than doubled, bringing much needed income to local families.

gradual shift from crops highly dependent on rain, such as paddy (rice) to ragi (Finger Millet), which requires less water for cultivation. Even with this kind of shift in agricultural practices, unpredictable weather is making farming difficult: two years ago, many farmers in Bannerghatta lost their crops because of drought, while last year, many lost their harvest due to excessive rainfall. Most are marginalized farmers eking out their livelihood from the crops they grow.

In addition to food insecurities and loss of livelihood, farmers report increasing numbers of wildlife foraging on their crops. These precarious farming conditions in the forests of Bannerghatta pit farmers and wildlife against each other in competition for natural resources.'

Sagarika Phalke, Programme Officer, A Rocha India



Holding out hope in a climate of greed

'I grew up before climate change was news. Now, it seems the only news.'

The beach house where I spent so much of my childhood is on Australia's East Coast, an area which will likely be uninhabitable this century with two degrees of warming. My elderly mum patrols the beach daily, alarmed at shrinking dunes from rising seas and storms. She grieves as old trees that likely germinated before the Industrial Revolution crash into the ocean, destroyed by a weirding climate unleashed by that same revolution.

Stuart Blanch at Hunter Wetlands Centre, Shortlands, New South Wales (Jonathan Carroll)

Coastal freshwater marshes at a community wetland centre I managed were squeezed from all sides by extreme, unpredictable weather last year. Record-breaking hot and dry conditions over two summers dried out our Ramsar wetlands, killed wildlife, wilted plants, halved visitor numbers and induced heat stroke amongst volunteers. Estuarine water invaded the wetlands as sea levels rose, replacing endangered salt marsh vegetation with mangroves. Sweating in 40 degrees, I watched coal trains speeding heedlessly to port and wondered if God was judging humanity through our own collective – but imbalanced – greed and refusal to 'take care of' the Garden (Genesis 2:15).

I now advocate to protect Australian forests from being bulldozed. Yet even when we secure stronger laws to save Eucalyptus trees, heat stress, bushfires and drought mean wildlife is disappearing. Forests are quieter. Even our beloved koalas are dying out in hotter and drier inland forests.

Climate change is dialling up Australia's normally challenging weather. Extremes are more extreme. We break new climate records with record-breaking speed.

The climate crisis is a greed crisis. It is one that A Rocha Australia must bear witness to in perseverance and truth as we grow.

So I live out hope in the Lord and His promises, and marvel at His Creation. The climate and biodiversity crises must drive me to action in love through prayer, not hate and despair.'

Stuart Blanch, Board Member, New South Wales, A Rocha Australia

Your support is enabling A Rocha Australia to work with Cassinia Environmental, a pioneer in carbon farming in Australia, to carry out biodiversity studies on the Cassinia property. Through revegetation projects and ecological offsets, this partnership is developing creative ways to fund nature conservation and protect against climate change.



Koala *Phascolarctos cinereus* (Chris Naylor)

Taking care of the oceans



Surveying rockpools at Watamu Marine National Park (Bob Sluka)

'Corals are highly susceptible to the impacts of rising temperatures – bleaching has impacted coral reefs globally, including reefs within Watamu Marine National Park (WMNP) in Kenya. Corals occur in reefs as well as in other habitats and, in WMNP, there are important coral species, such as *Anomastreaa irregularis*, an IUCN Red Listed Vulnerable species.

We know very little about the impacts of temperature on corals in these non-reef habitats and in particular on *A. irregularis*. So we have been monitoring rockpool coral populations for several years, focusing on distribution and biodiversity. We hope to install temperature gauges in the rockpools and will continue to monitor these populations as they experience extreme temperatures and may give us clues as to the future of corals worldwide.'

Dr Robert Sluka, Lead Scientist, Marine and Coastal Conservation Programme

Your support has enabled marine scientists to gain a greater understanding of the impacts of temperature rises on coral reef ecology and make a meaningful contribution towards meeting the United Nations Sustainable Development Goal 14 (Life Below Water). Your donations have also equipped vulnerable, local young men with conservation training to become rockpool guides, which is improving their livelihood.



Home improvements bring hope for the Roller

'I work with a small team of volunteers in Provence to protect the European Roller *Coracias garrulus*. In recent years, I've noticed that the hatching date of the Rollers' eggs coincides with the yearly cicada outbreak, which occurs generally around mid-June.

Cicadas constitute over 50 percent of a chick's diet. As air temperature correlates with cicada eruption, climate warming and variability, could upset the timing of Rollers' reproduction with the availability of food. I am concerned this could greatly affect the chicks' survival and so now I closely monitor hatching dates of all the Roller pairs in our study sites.

A worrying effect of climate change is the increasing frequency of extreme heat waves, particularly in early summer. Many Rollers are breeding in artificial nest boxes exposed to direct sunlight. In the beginning of the breeding season this is an advantage, as boxes warm up quickly each morning and egg survival and incubation is positively affected. However, in the event of early heat waves, this effect is reversed as, when ambient air temperatures reach 35°C, temperatures inside the nest boxes can exceed 50°C, which can result in eggs and young chicks dying.

After observing these damaging consequences, I decided to change our nest box placement recommendations to advocate locating boxes in a shaded location or turned to face north.

I believe that the increase in climate change and variability is a major challenge to many species, especially long distance migrants such as European Rollers, which have fewer options to adapt their reproduction timing and are more susceptible to yearly climatic and food variations.'

Timothée Schwartz, Scientific Director, A Rocha France

A Rocha France has been studying the European Roller for 15 years.

Thanks to you, 50 nest boxes have been established in one of France's most important areas for the conservation of Rollers: the Vallée des Baux, in Provence. Together with other conservation measures such as planting hedges and creating perches, the nest boxes have helped to increase the population of Rollers in the region, despite decreases at other sites in southern France. The focus of one of the team's studies examines the use of artificial nest boxes compared to natural nesting sites. The results help us to make improvements in the siting and use of the nest boxes – vital in the face of so much climate uncertainty – and provide recommendations for good practice to others.





Every year during the rainy season, more than 10,000 native trees are planted in school grounds and within Kenya's Arabuko-Sokoke Forest, restoring degraded areas of this threatened dry coastal forest and helping to tackle climate change (Sarah Young)

A climate of change

Reading stories from A Rocha people around the world who are experiencing the effects of climate change, it can be easy to feel despondent. But we are hopeful, for there are fantastic A Rocha projects making a difference – all thanks to people like you who support this work.

Your generosity can involve communities in planting trees, which protects habitats and locks up carbon. Small-scale farmers can learn how to cope with unpredictable rainfall, enabling them to provide food for their families. Young people and their families can study the impacts of climate change and how to live better. And conservationists can respond by studying wildlife to understand when survival is threatened and find ways to help it adapt and flourish.



A gift from you today will help strengthen and support this work.

Donate online at aroc.me/climate-of-change

For nearly 30 years, A Rocha Portugal and Cardiff University have been studying how climate change may affect the survival of European Storm-petrels *Hydrobates pelagicus*, particularly in relation to changes in the surface temperature of sea water and the availability of food (Andrew Shepherd)

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Cover photo: Thunderstorms over the Pacific Ocean. (NASA Image and Video Library)