

A sustainable future?

by Isabel Carter



Ralph Hodgson/Tearfund

What kind of future are we leaving for the next generation?

'Climate change' is a term used to describe a large-scale, long-term change in the earth's weather patterns or average temperatures. It happens partly because of natural causes, but also because of human activities. In particular, average global temperatures have risen since countries first started to burn coal, oil and gas (known as fossil fuels) about 200 years ago.

This was when the Industrial Revolution began, which used coal to drive machines. Industry spread around many parts of the world, based on the immense power that comes from burning fossil fuels. These fuels were formed from the decayed and fossilised

remains of organic matter, such as forests, buried millions of years ago. Now we use fossil fuels for a huge number of purposes, including heating, lighting and transport. Oil is also used to make other useful products such as plastics, fabrics and fertilisers.

Words used in this article

Emissions in this article refers to greenhouse gases that are released into the atmosphere.

Sustainable means that something can continue in the long term. Sustainable development means meeting today's needs without damaging the ability of future generations to meet their needs.

The greenhouse effect

However, humankind is now feeling the impacts of a major side effect of burning these amazing energy resources. Fossil fuels release 'greenhouse gases', which include carbon dioxide, methane and nitrous oxide. These collect in the world's atmosphere, making it absorb more heat from the sun. This changes normal weather patterns and seasons. Average temperatures will

In this issue

- 3 Editorial
- 4 Bible study
- 5 Planting for the future in Brazil
- 6 Why advocate on climate change?
- 8 Coping with climate change: seven farming tips
- 10 Heat exhaustion and heatstroke
- 11 Mushroom growing
- 12 Renewable energy and your community
- 14 An interview with the Eco-bishops
- 15 Resources
- 16 Up close and personal: children learning about nature

increase by several degrees by 2100 unless we dramatically reduce the amount of greenhouse gases in our atmosphere and begin to live more sustainably. In some parts of the world, the temperature rises may be higher. Scientists tell us that if the average global temperature rises by just 1.5 degrees (compared with levels before the Industrial Revolution), the consequences could be very serious for humankind.

Individual events in the weather can never be linked directly to climate change alone. However, rising temperatures will make existing weather patterns more intense. We are already experiencing some of these impacts, including the following:

- **Rainfall** can be unpredictable and sometimes much heavier. This leads to more severe droughts, floods, landslides, changing rainy seasons, damage to infrastructure and crop failures.
- **Extreme weather events** (such as heatwaves, floods and droughts) are likely to become more frequent and intense. Seasonal ocean storms are becoming more severe.

Footsteps is a magazine linking health and development workers worldwide. Tearfund, publisher of *Footsteps*, hopes that it will provide a stimulus for new ideas and enthusiasm. It is a way of encouraging Christians of all nations as they work together towards creating wholeness in their communities.

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Readers are invited to contribute views, articles, letters and photos.

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Peter Caton Tearfund

Rafiqsa Shikari and his family faced flooding after a cyclone in Bangladesh.

■ We are seeing **changes in the ocean.**

Sea water expands as it warms, causing a gradual rise in global sea levels. The melting of the ice caps, and of some glaciers that are on land, also leads to rises in sea level. In addition, the oceans have absorbed half of the carbon dioxide that has been released so far through human activities. This has made them more acidic, ultimately threatening many sea creatures and ecosystems.

International efforts

We now realise that climate change is one of the biggest challenges facing the world today. It is already affecting food security and water resources. It is directly linked to an increase in the number of medium-scale disasters, especially in lower-income countries. Unfortunately, these impacts will continue to grow for many years to come, even if humankind takes serious action now. Climate change is a truly global issue. It means we have to change the way we

plan for the future, and we must all change the way we live now.

And climate change is not the only problem. In recent decades, humankind has often exploited many natural resources (such as fish, minerals, water and forests) so much that supplies are no longer sustainable. We are causing massive pollution, destruction and degradation to the natural environment on which we all depend. The population is rising rapidly, and we are simply not living sustainably. At present we are using up the annual natural resources of 1.6 Planet Earths each year. But we only have one Earth...

All of these issues need to be tackled at the same time as addressing climate change. This will help to ensure that our future is secure and sustainable. The UN has produced a new set of 17 Sustainable Development Goals for the 15 years between 2015 and 2030. These goals will guide the efforts of governments, civil society and businesses to become more sustainable.



Illustration: Petra Röhr-Rouendal, *Where there is no artist* (second edition)

Churches, communities, NGOs and businesses can influence those in power to take action on climate change.

The UN Climate Summit

Since the early 1990s, governments and civil society have been working together, through the UN, to try to tackle the causes of climate change at a global level. In recent years, they have also started to address the impacts of climate change, looking at how lower-income countries can adapt, and how to fund this adaptation.

Each year the UN hosts a Climate Summit to look for a global solution to climate change. These meetings bring together politicians, negotiators and scientists. A fair solution is challenging because it is an unequal problem. The countries that have contributed most to greenhouse gas emissions usually suffer least from the impacts of climate change. These countries are often unwilling to take action to cut their emissions. Countries hit hardest by climate change have often contributed very little to causing the problem, but need help to adapt. These countries tend to be less influential but can have a very powerful moral voice when they speak and act together.

The Paris Climate Summit took place in December 2015. It was particularly important because the existing agreement (known as the Kyoto Protocol) ran out in 2015. People had high expectations of the summit, and Christians were praying for a meaningful and fair global climate agreement. Thankfully, after two challenging and tense weeks of discussion and negotiation, the Paris Agreement was

Nepal at the UN Climate Summit

by *Raju Pandit Chhetri*

Nepal is a small, landlocked country in the Himalayas, rich in natural resources and wildlife. However, climate change has made it one of the most vulnerable countries in the world. Nearly 70 per cent of the population rely on agriculture. Farmers are the first to be hit by the impact of climate change. Flooding, landslides and droughts are happening more than ever before. There are also major changes to the pattern of the monsoon rains.

Nepal spent time preparing to raise its concerns in Paris at the UN Climate Summit

in December 2015. Our major focus was to gain support to help us adapt to climate change. Another priority was addressing permanent damage to our country due to climate change. Nepal decided to ask richer countries for ambitious actions to reduce their carbon emissions. We aimed to play a constructive role as one of the 48 vulnerable and poor countries represented in Paris.

Raju Pandit Chhetri is Director of Prakriti Resources Centre, Kathmandu, Nepal. Raju previously worked for many years with one of Tearfund's partners in Nepal.

reached unanimously by 195 countries. This was a historic moment – the first time full global agreement to tackle climate change has been reached! Many countries and organisations would have liked stronger targets, but the Paris Agreement provides a positive starting point for global action.

What action can we take?

Learning about climate change and the pressures on the world's resources can seem very challenging. But by coming together in our communities and organisations, we can all make a difference. You do not need to understand fully all the complex processes involved. You can simply write and tell politicians about the impact that climate change is having on your own situation. You may

also be able to play a role in influencing ongoing global negotiations by getting to know those who negotiate for your own government and influencing them ahead of international meetings. Communities and churches can play an effective role in helping governments make good decisions about climate change. Many of Tearfund's partners have achieved this and become trusted advisers to governments. As Christians we can share our concern for God's precious creation by reflecting prayerfully on our surroundings, our lives and our use of resources.

Isabel Carter led Tearfund's International Publications team until 2007. She is now a freelance writer and editor with a particular interest in climate change issues. For further reading: www.prayandfastfortheclimate.org.uk

EDITORIAL



Isabel Carter

What a pleasure it has been to help edit this issue of *Footsteps* while Helen Gaw is on maternity leave! I edited *Footsteps* from 1989 to 2007, so the last issue I edited was number 71. It

has been a blessing to have contact again with friends and colleagues within Tearfund and the *Footsteps* Editorial Committee. It helps that the subject matter is very close to my heart.

This issue looks at some major topics, and considers how all of us can play a role in

making our communities, our agriculture and our activities more sustainable. Can the world's nations come together to solve the massive global issue of climate change (pages 1–3)? The future looks difficult for humankind if we cannot come together as a global community to resolve this issue. There is a real need for Christians to show leadership (page 14) and support advocacy work (pages 6–7). We also consider new sources of renewable energy (pages 12–13) and how to adapt our agricultural practices (pages 8–9).

Hope for the future comes from 2 Peter 3:13: *'But in keeping with his promise we are looking forward to a new heaven and a new earth,*

where righteousness dwells.' My prayers are for the renewal of this beautiful, varied and God-given creation, as we all learn how to care wisely for the environment and live more sustainable lives.

Isabel Carter is Guest Editor of Footsteps 99, working together with Footsteps Editor Zoe Burden. The next issue of Footsteps will be the celebratory 100th edition. We will be taking a little extra time to prepare this issue, which will be available in English in July 2016. Before then, please send us your best stories about how you have used Footsteps!

Life in all its fullness

by Rachel Mash

Introduction

In pairs or small groups, spend a few moments sharing where each of you feels closest to God.

Then share a sentence from your partner with the bigger group (eg 'Sipho feels closest to God walking on the mountain'). Reflect on how often people feel close to God in nature.

Read Genesis 2:4–15

In the beginning, God created the heavens and earth, the plants, the animals, the people and all our ecosystems. And God saw that it was good.

God placed human beings on this beautiful garden planet, intending them to work the land and look after it (Genesis 2:15).

But then things began to go wrong. Adam and Eve were tempted by the serpent and disobeyed God's command. This is what we call 'the Fall.' We will now explore what happened after sin entered the world.

1. God and people

How would you describe the relationship between God and humans when God first placed them in the Garden of Eden?

Read Genesis 3:8–11

- What was the relationship like between God and humans after sin came into the world?



- How do we see this breakdown in the communities in which we live and work?

So the first breakdown was in the relationship between God and people.

2. People and people

Read Genesis 2:22–25, 3:6–7, 3:11–13 and 3:16

- What was the relationship like between Adam and Eve in the beginning?
- What was their relationship like after sin came into the world?
- How do we see this breakdown in the communities in which we live and work?

Reflect on the fact that in the following generation, Cain and Abel brought jealousy, hatred and murder into human relationships. So the second breakdown was in relationships between human beings.

3. People and the environment

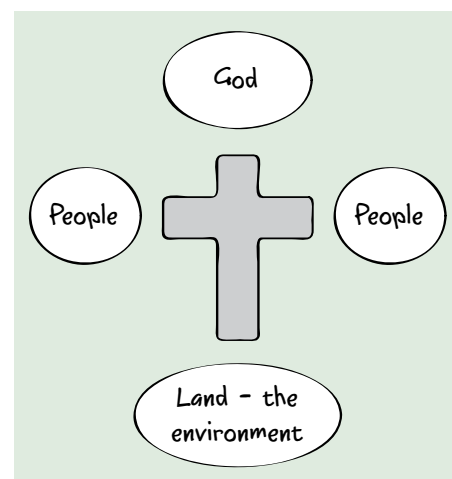
Read Genesis 2:8–9, 3:17–19 and 3:23

- What was the relationship like between people and their environment in the beginning?
- What was the relationship like after sin came into the world?
- How do we see this breakdown in the communities in which we live and work?
- How do we see this breakdown at a global level?

So the third breakdown was in relationships between people and the environment.

Conclusion

God was determined that the Fall would not be the end of the story of creation. He sent Jesus to save us from sin and to make it possible for the relationships between God, humans and the environment to be restored.



Draw this image onto a flipchart and use it for a time of reflection on John 10:10.

Reflect in small groups:

- What does it mean to have life in all its fullness?
- How does this study affect the way we think about the environment? What practical action can we take?

We will end with a prayer for our world (see box).

Rev Dr Rachel Mash is the Environmental Coordinator for the Anglican Church of Southern Africa
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A prayer for our world

*Almighty God,
you created the heavens and the earth
and all that is in them,
and you created humankind in your own image,
and it was very good:
grant us the courage to recognise our failure to maintain your creation
and by your grace do all that we can to halt the degradation of our environment,
through Jesus Christ our Lord
who came that we might have life in all its fullness. Amen*

Taken from Season of Creation One by Green Anglicans: www.greenanglicans.org/resources/liturgical

Planting for the future in Brazil

by Flávia Marques Amorim



Semi-arid regions are vulnerable to changing rainfall patterns, which can be caused by climate change.

ACEV (Ação Evangélica – Evangelical Action) is a Tearfund partner working in the semi-arid region of north-east Brazil.

ACEV works with its partners to develop sustainable projects that encourage a healthy relationship with the environment. Its Planting Project works alongside its other projects on well-drilling and agroforestry. The wells provide vital drinking water in poor communities and the agroforestry work promotes environmental sustainability and reforestation.

ACEV's Planting Project encourages organic farming methods. It helps families learn how to grow healthy, good-quality crops without the use of chemical pesticides or fertilisers. The project team support and guide families for six months, and an agricultural consultant provides advice. They work with farmers on issues such

as water use and micro-irrigation; soil care and fertility; appropriate crops; crop rotation; and natural fertilisers and insecticides. They also encourage participants to set up farmer cooperatives.

ACEV values education. Communities can join workshops on environmental issues, such as:

- disposing of rubbish sensitively
- valuing and protecting rare local plants and animals
- planting appropriate tree species such as neem and moringa, which cope well in semi-arid areas.

At the end of these workshops, communities are asked to commit to good environmental practices. Over the three years of the project, ACEV staff have seen habits change in caring for the environment.

José Ivonildo Fernandes worked with the Sítio Pinheira community in Manaíra. He notes:

'The area was first fenced. Then we planted crops like bananas, passion fruit and pigeon peas along the fence, which acted as windbreaks and could also provide food and an income. Another important step was to diversify the vegetables that were planted. The community now plants new vegetables such as beetroot, peppers, carrots, courgette and cabbage, as well as the lettuce and coriander they grew before. These crops

Making natural insecticides

Chilli Grind a cup of chillis (be very careful not to get any on your eyes or mouth), add 2 litres of water, stir well and allow it to settle. Drain off the liquid and add some soapy water to it. Spray onto crops.

Tobacco Boil 2 handfuls of dry leaves or cigarette ends in 2 litres of water for 20 minutes. Add some soap, mix and cool. Dilute with 5 litres of cold water and spray onto crops.

Neem Grind two handfuls of ripe neem fruit and mix well in 1 litre of water. Soak overnight, strain and use as a spray.

are all produced organically with natural insecticides [Editor: see box for examples]. People used to burn scrub and crop remains, but now we compost it and mix it with animal manure to fertilise our land.'

The Planting Project means that people have a reliable supply of healthy organic food. Because no chemicals are used, water quality is protected. Using minimum tillage protects the structure and fertility of the soil and reduces erosion. All these practices encourage local biodiversity and help protect the environment.

Antonio Felix Florentino leads the cooperative in Sítio Pinheira. He comments:

'Today, with ACEV's help, I no longer need to leave Pinheira and work elsewhere for income. What has most impressed me about ACEV has been the encouragement and support they have given us to preserve nature and the environment. In the past, we did not care much, but now we want to preserve the land God has given us.'

'This year there has been a terrible drought, but I thank God that we are now seeing the benefits of the Planting Project. I am sure that God has blessed us, and will continue to bless our lives and this place.'

Flávia Marques Amorim is ACEV Social Programme Coordinator
Website: www.acevbrasil.org.br

Words used in this article

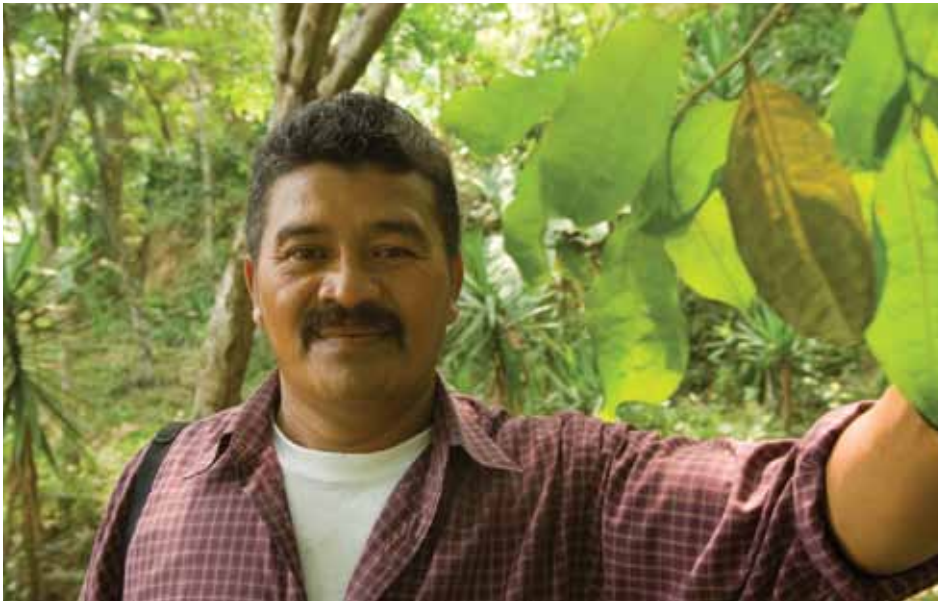
Agroforestry means growing crops and trees together so that both benefit.

Biodiversity means the variety of plant and animal life in an area.

Minimum tillage means disturbing the soil as little as possible when planting seeds. This improves fertility, reduces soil erosion and retains water in the soil.

Semi-arid describes a region that has low levels of rainfall, but is not a desert.

Why advocate on climate change?



Geoff Crawford Tearfund

Forests are being protected in Honduras because of advocacy efforts by a Tearfund partner.

What is advocacy?

Advocacy is about influencing people and public policies to bring about change. It involves influencing those in power to act more fairly, in order to bring justice and address the causes of poverty.

Advocacy is firmly rooted in the Bible and is based on God's commitment to justice:

'Speak up for those who cannot speak for themselves, for the rights of all who are destitute. Speak up and judge fairly; defend the rights of the poor and needy.'

Proverbs 31:8–9

Advocacy involves building relationships with people in authority and raising their awareness in order to influence them about a particular issue. It includes suggesting potential solutions.

Raising awareness of climate change

Climate change will affect all of us and is a key issue to advocate about. With climate change, an important first step is often to raise people's awareness about the cause of the problem. You could try asking a few simple questions about changes in

the weather or harvests – this may quickly reveal that people are already aware of the impacts of climate change on their lives and environment. Public meetings, talks, discussions and newsletters are all examples of ways to share information about the issue. Working with the media can be another very helpful way to reach both decision-makers and ordinary people. Advocacy can be done *with* communities affected by a situation, supported by organisations who work on climate change issues. Or it can be done *directly by* the communities who are affected by a situation.

The impact of climate change is linked to problems such as environmental degradation, food insecurity, disasters and water resources. It often makes existing problems worse.

'The climate has changed and the rainy season has become unpredictable. The water levels fall year by year and some kinds of animals and vegetation have disappeared. The future is bleak for farmers and cattle-breeders alike.'
Tearfund partner in Mali

Tackling climate change

There are two important ways to tackle climate change: **adaptation** and **mitigation**.

Adaptation is about taking action to cope with the consequences of climate change, both now and in the future. For successful adaptation, countries and communities

Protecting national forests in Honduras

Forests play an important role in absorbing carbon dioxide (one of the gases contributing to climate change). When forests are cleared or burned, large amounts of carbon dioxide are released.

The government of Honduras proposed a reform of forestry law that would have allowed large sections of national forest to be sold to logging companies. These companies could then choose whether or not to reforest the land. The importance of Honduras's national forests to poor farmers and indigenous groups living in these areas was ignored.

Tearfund's partner, Asociación para una Sociedad más Justa, saw that this could have devastating consequences. They formed an alliance with representatives from various groups, including indigenous groups, cooperatives, churches, ecologists and farmers' groups. This alliance urged the government to make changes to the legislation it was planning. They hired consultants to analyse the proposal and present reasonable alternative proposals to the government.

The alliance also began a media campaign to educate people about the problem and to pressure the government into negotiating.

The government agreed that they would not bring the reform of the forestry laws to the Honduran congress until the reform had been approved by a committee, made up of representatives from the alliance, the government and logging companies. Most of the alliance's proposals were accepted. Marginalised groups such as poor farmers, cooperatives and indigenous groups were able to participate for the first time in the making of a law that affected them directly.

Visit www.asjhonduras.com/cms to read more about Asociación para una Sociedad más Justa.

Engaging local leaders in river dyke construction in Malawi

Disaster risk reduction can be an important way of helping communities adapt to climate change. In Malawi, local communities faced a problem when a local river changed course and displaced households in several villages. When heavy rains came, some people's gardens were washed away. Tearfund's partner River of Life and the affected local communities realised that constructing a dyke would redirect the river flow.

River of Life started an advocacy initiative among traditional leaders, church leaders, teachers and government officials. They met together and heard about the

communities' solution for the problem. After much discussion, stakeholders agreed on the project and committed to providing some of the resources required. For example, the district assembly agreed to provide a tractor. The government forestry department agreed to help plant trees along the riverbank. The community agreed to do some of the practical work.

The advocacy activity helped to transform and build relationships. Traditional leaders, church leaders and government officials were able to work together and view each other as partners in development.

need financial resources and the right technologies and advice. Adaptation needs to be included as a key part of national development planning.

At the **local level**, advocacy around adaptation might involve influencing local officials or agencies to help communities adapt – for example, by using alternative crops or protecting land from flooding. At the **national level**, advocacy work might involve encouraging governments to include adaptation work in their national development planning and programming.

Mitigation means reducing emissions of greenhouse gases, especially in higher-income countries. It involves helping poorer countries to access renewable energy, and making sure they have funding for this. It includes helping countries to protect their forests.

At a **local level**, advocacy around mitigation could involve ensuring local authorities create or enforce laws to protect forests. It could focus on small-scale renewable energy options for local communities. At a **national level**, advocacy could include encouraging governments to create national development plans involving mitigation.

Civil society organisations can work with people living in poverty to help their voices be heard by those in power. This

can be done by empowering people to speak for themselves, speaking with those affected by climate change or speaking on behalf of communities.

Churches can make a big difference

Local churches are part of many communities around the world. Church members often have personal experience of poverty and injustice, and understand both very well. Christian organisations and churches can advocate with or for people who are being affected by climate change. Churches can gain a deep understanding of local issues, and have a long-term presence in a community. They can use their coordinating body (eg diocese or denomination) to gain the respect and authority needed to influence policies at a local, national, regional and international level.

Christian advocacy work should be supported by both prayer and a deep passion for justice for people who are impacted by climate change.

This article is adapted from a short guide by Sara Shaw, Why advocate on climate change? See Resources page for further details.

Are you or your organisation involved in advocacy and campaigning on climate change or other environmental matters? We at Tearfund would love to hear about it as we continue our advocacy around these issues. Please write to us by post or email using the addresses on page 2.

Ten key questions to discuss

When you are thinking about getting involved in advocacy on climate change, it may be helpful to discuss the following questions:

- 1 How have weather patterns changed and how is this affecting the lives of local communities? Is there a need to explain the causes and impacts of climate change to others in our community?
- 2 Could we keep long-term records about changes in the local environment, such as temperatures, rainfall and drought? Can we work with an organisation to use this information in advocacy on climate change?
- 3 How could local authorities or leaders help people to cope with the impacts of climate change? How can we create opportunities for community members to talk to local decision-makers?
- 4 What could be done by local or national authorities or leaders to protect or restore forests? Can we advocate for new laws to protect forests, or ensure existing laws are properly enforced?
- 5 Do people in the community have access to energy? Could we encourage the local authorities to consider clean, small-scale sources of energy such as solar, wind or hydro-electricity?
- 6 Is the government considering sustainable, clean energy provision in its national development planning? If not, what can we do to encourage this?
- 7 Is there a policy for preparing for droughts? If not, can we encourage the authorities to develop one?
- 8 Does our country have a National Adaptation Plan (see Resources, page 15)? If not, what needs to be done to make sure that it develops an effective plan?
- 9 How can we positively influence our government's position when the UN meets to discuss climate change? (This might involve campaigning at a national level.)
- 10 Are there any local climate advocacy organisations that we could join?

Coping with climate change: seven farming tips

compiled by Bertha Chunda

Climate change can affect weather patterns, and this may have a damaging effect on agricultural production. Difficulties such as drought, flooding or changes in rainfall patterns are particularly serious. People need to understand

what is changing in their situation and consider how to adapt their farming methods. Here are some ideas that may help. Alternative livelihoods, and finding ways of processing agricultural produce to add value, can also help people.

1 Drought-resistant and early maturing crops

Focus on crop varieties that are resistant to drought. These include cereals (such as millet or sorghum), legumes (such as cowpeas, pigeon peas, chickpeas or green gram) and root crops (such as cassava, sweet potato and yams).

Early maturing varieties help communities get through the hunger season before the main harvest.

Cassava is a root crop that can cope well with drought.



PLEASE NOTE: Cassava must be properly prepared or it can be poisonous. Sweet cassava can be peeled and cooked thoroughly to make it safe. Bitter cassava needs more thorough preparation. Here is one way to make it safe: first, peel and then finely chop or grate the cassava. It should then be soaked in clean water for a minimum of three days (but ideally for five days). After this, it should be boiled thoroughly. Any water used for soaking or cooking the cassava must be thrown away

3 Stagger planting times

Use long-range weather forecasts whenever possible before planting, to benefit from predicted rains. Plant crops at different times. Plant some after the first rains, some just before the main rains, some immediately after the rains, and some three weeks after the main rains (when planting will help destroy early germinating weeds). This practice will make it more likely that some crops are successful even if rainfall patterns change.



2 Change cropping patterns

Increase the variety of crops grown, because different crops are affected differently by changing weather conditions. Hopefully some crops will do better whatever the conditions that year.

Use **mixed cropping** – growing two or more crops close together in the same field. Plant rows of cereals such as maize, millet and sorghum with rows of legumes such as cowpeas, beans or lablab. This can benefit the cereals, as legumes fix nitrogen in the soil, providing extra nutrients. The legumes help to cover the soil and keep it moist.

Crops from the same family, or crops that need the same nutrients, should not be planted together (as they will compete with each other). For example, maize should not be mixed with sorghum or millet.



4 Rainwater harvesting

As weather patterns and rainy seasons become more unreliable, there are great benefits in storing rainwater or flood water for use in dry periods. There are several types of rainwater harvesting systems. Some gather rainwater that flows along the ground or from rooftops. Other systems divert the flow of floodwater from watercourses (such as rivers, ditches and dykes), and store the water in ponds.

Practical Action has an excellent free technical brief on building a sunken tank to store run-off rainwater. Visit www.practicalaction.org/run-off-rainwater-harvesting



5 Protect the soil

Keep the soil covered as much as possible. This will shade the soil and help to prevent weeds and soil erosion. Use ground cover crops, such as fast-growing lablab bean, velvet bean, cowpeas or pumpkins, between rows of crops. Leave them to continue growing after harvesting the main crop. Leave crop waste on the soil surface as a compost. Dig the soil as little as possible to avoid water loss. All these practices will protect the soil and help conserve water.

6 Small livestock

Keeping small livestock can provide you with food and income even when crops fail. Small livestock such as poultry (chickens and ducks) and rabbits are easier to feed and manage than larger livestock such as cattle. In areas prone to flooding, ducks cope much better than chickens.

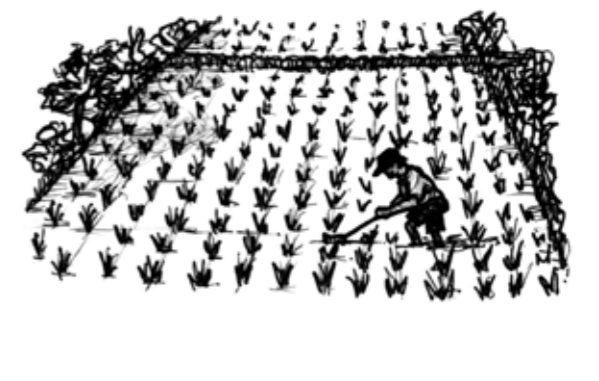


7 System of Rice Intensification (SRI)

System of Rice Intensification (SRI) began in the 1980s as a way of increasing the yield of irrigated rice. It involves transplanting young seedlings to create more space between them. SRI has been used in more than 50 countries and can greatly increase the amount of rice produced. It will reduce the amount of seed required and will halve the amount of water needed.

The rice seedlings should be carefully transplanted at the two-leaf stage, just 8–12 days after sowing. Plant them 25cm or more apart in a square pattern. Use compost if you can (only use chemical fertiliser if it is necessary). Keep the soil moist but not flooded. Start weeding the area after 10 days and repeat this every 7–10 days until the rice is well established.

SRI principles and practices have now been adapted for rainfed rice, wheat, sugarcane and teff.



Bertha Chunda is the Global Food and Livelihoods Adviser for Tearfund

Heat exhaustion and heatstroke

compiled by Zoe Burden

Periods of intense heat, known as heatwaves, are becoming more common because of climate change. When it is very hot, people can suffer from health problems such as dehydration, heat exhaustion and heatstroke. In 2015, thousands of people died in India and Pakistan during a heatwave.

Anyone can develop illnesses caused by the heat. However, the risk is higher for groups such as children, the elderly and people with certain medical conditions.

Heat exhaustion

Heat exhaustion can develop when someone is exposed to high temperatures and their body loses water and salt. It is less serious than heatstroke, but it can lead to heatstroke if it is not treated soon enough.

Symptoms of heat exhaustion vary, but may include:

- sweating a lot
- muscle cramps
- tiredness and weakness
- headache
- nausea and/or vomiting
- feeling faint or dizzy
- feeling very thirsty
- fast heartbeat
- urinating less often and having darker urine than usual
- low blood pressure
- fast, shallow breathing.

TREATING HEAT EXHAUSTION

If someone is showing signs of heat exhaustion, you should:

- Get the person to drink liquids. They should ideally drink water, juice or a rehydration drink.
- Help them to lie down in a cool place.
- Remove any unnecessary clothing.
- If possible, give the person a cool (not cold) bath or shower. Otherwise, apply a cool, wet cloth to their skin, or wrap them in a cool, wet sheet. Keep these cloths wet.

- Keep fanning their skin while it is moist. As the water evaporates, it will help their skin to cool down.
- If you have cold packs, place these on their neck, armpits, groin and back.

If the person does not respond to this treatment within 30 minutes, seek medical help.

Heatstroke

Heatstroke is less common than heat exhaustion, but it is much more serious. It happens when the body loses its ability to sweat and cool itself down, causing the body's temperature to rise dangerously high. Heatstroke can have many of the same symptoms as heat exhaustion (see above), but may also include:

- hot and dry skin with no sweating (or sweating that suddenly stops)
- confusion
- loss of consciousness
- seizures (fits).

Heatstroke can cause death or permanent disability.

TREATING HEATSTROKE

If you suspect that someone may be suffering from heatstroke, seek medical help immediately. Any delay can be fatal.

While you are waiting for medical help to arrive (or while you are taking the person to a health centre), follow the advice (left) for treating heat exhaustion. In addition:

- If the person is unconscious and vomiting, place them on their side and make sure there is nothing stopping them breathing.
- If the person has a seizure, do not place anything in their mouth.



Illustration: Petra Rohr-Rouendaal, Where there is no artist (second edition)

If someone is suffering from heat exhaustion, rehydration drinks can help.

Staying healthy in the heat

Here are some simple steps to help protect yourself during very hot weather:

- Stay indoors and avoid outdoor activities. If this is not possible, do these activities during the coolest parts of the day, and with other people. Always carry safe drinking water with you.
- Drink plenty of fluids, and avoid alcoholic or very sugary drinks. In extreme heat, drink a cup of rehydration drink once or twice a day. You can buy packets of oral rehydration salts (ORS), but it can be much cheaper and just as effective to make your own. Mix 1 litre of safe drinking water with half a level teaspoon of salt and 6 level teaspoons of sugar. Someone with diarrhoea needs a cup of rehydration drink after every watery stool.
- Wear loose, light-coloured clothing. If you go outside, cover your head.
- Take cool showers or baths regularly. Sponge yourself with cool water throughout the day.
- Eat cold foods, such as salads and juicy fruits.
- Check on family and neighbours regularly, and ask others to check on you.

Adapted from Cathy Travis, Extreme heat & how to prevent heat-related illnesses (Interhealth), with reference to the UK's National Health Service websites www.nhs.uk and www.nhsinform.co.uk. See www.interhealthworldwide.org for more details.

Mushroom growing

Mushroom growing can be a useful way of earning income when climate change makes farming less reliable. They can also be used as extra food for the family. They grow quickly and are rich in protein, vitamins and minerals. You do not need farmland to grow mushrooms, so it is a useful activity in both rural and urban areas.

There are several ways of growing mushrooms. They can grow in plastic bags, in pots, on logs or on wooden trays arranged in stacks – anywhere where light levels, temperature and water can be controlled. A simple building can provide controlled growing conditions. The growing cycle takes between one and three months. If possible, get advice from someone with good experience before starting.

There are many edible mushroom species and each grows best in a particular growing medium. However, some species can grow on a wide range of materials. The growing medium can be prepared from materials such as rice straw, rice bran, banana leaves, sawdust and logs (see box). The easiest types of mushroom to grow in hot areas are oyster, volvariella and maitake.

Choose a growing medium that is easy to obtain. It needs to be chopped up, soaked under water for several days (to kill insects) and then dried and mixed with some lime and fertiliser. Ideally it should be sterilised by steaming. You can use a 44-gallon drum or similar container to make a steriliser. Modify the container so that the growing medium is held at the top, and boil some water at the bottom.

Then place the growing medium into containers and add the mushroom spawn.

PLEASE NOTE: *Mushroom spawn is best produced in special sterile conditions. You will probably need to buy spawn from a specialist supplier. You can research local suppliers using the internet, or by asking community members, universities or NGOs.*

After it is placed in the growing medium, the spawn will produce something called mycelium. This looks like white fibres, and will take about 10 days to spread through the growing medium. The mycelium will begin to produce mushrooms. These usually grow in batches every few days. Once

mushroom production really slows down after two or three months, you can start the process again. Use the old growing medium as compost or fertiliser for other crops.

Key steps

1. Identify and clean a building or containers where the temperature, light level and moisture can be controlled.
2. Choose and prepare the growing medium.
3. Sterilise the medium.
4. Seed the growing medium bags or beds with spawn.
5. Maintain the correct temperature, moisture, hygiene and lighting. These will differ between species.
6. Harvest, process, package and sell the mushrooms.
7. Clean the growing area and begin again with fresh growing medium and spawn.

Mushrooms are delicate. Harvest them with a sharp knife and place them in baskets or boxes to transport them. If you have mushrooms left over, they can be dried and stored for future use.



Will Boase Tearfund

Examples of growing medium

- **Rice/wheat straw** – oyster, straw and common mushrooms
- **Coffee pulp** – oyster and shiitake mushrooms
- **Sawdust** – shiitake, oyster, pom pom, ear or maitake mushrooms
- **Water hyacinth** – straw and oyster mushrooms

Ideally, buy new spawn each time you start the process. However, if this is difficult or expensive, you can keep back some of the older growing medium and use the spawn from this on new medium.

For more information see CTA's *Agrodoks 40 and 41*. Visit <http://publications.cta.int> and type 'mushroom' into the search box.

See also *Practical Action's technical brief*: www.practicalaction.org/mushroom-growing

PLEASE NOTE: *Some varieties of mushrooms can be poisonous. It is important to get expert advice before beginning a mushroom project.*

Moucecore mushroom project, Rwanda

A mushroom project started in 2006 in Burera district, Rwanda. There were 40 savings groups in the area. With the help of Tearfund partner Moucecore, group members came together and decided to form a cooperative.

In their area they lacked clean water. There was not much land available and it was not very fertile. There also were tensions between ethnic groups. After analysing their situation, they put their savings together and began a mushroom growing project. Household and crop waste was mixed with lime, sawdust and urea to produce

'mushroom mounds' (portions of growing medium). These could be sold to families, together with mushroom spawn. Up to 10 mounds could be grown in one square metre, so even the poorest families could take part. Each mound could produce up to 1.5kg mushrooms per week for three months.

The mushroom project was a great success. People's diet and income improved. Mushrooms were sold to hotels, restaurants, hospitals and boarding schools, as well as in the local markets. Working together also restored relationships.

Renewable energy and your community

Nearly 1.5 billion people around the world do not have access to electricity, particularly in rural areas. They depend on kerosene lamps and candles, which are often expensive and provide poor lighting.

Around 3 billion people depend on wood and wood products for cooking. Wood smoke exposes people to fumes that can damage their health. In many areas, wood supplies are very scarce and this leads to people cutting down trees in areas around towns and cities.

However, renewable energy can provide alternative sources of light and fuel. Renewable energy uses sources such as wind, water power and sunshine. Because this energy does not come from fossil fuels,

it does not contribute to climate change (except through the production of wind and water turbines and solar panels). Renewable energy can be regarded as the power of the future. Donors may be willing to consider funding requests for renewable energy sources. Many clinics and schools have benefited from grants to install PV panels (see 'Solar electricity' box) to run fridges and provide lighting. Below are three examples of different renewable energy sources. Could you use any of these in your location?

Solar electricity

There are two main forms of solar energy:

- **solar collectors**, which use the sun's energy to warm water
- **photovoltaic panels (PV panels)**, which use the sun's light to produce electricity.

Light up the World (LUTW) is a not-for-profit organisation based in Canada and Peru. Its workers have seen the way access to energy changes lives. LUTW trains local technicians to install PV panels and helps local organisations to provide solar energy effectively. They help empower communities to move towards a more sustainable future.

If solar PV systems are designed well, they do not need many materials, are easy to maintain and have minimal environmental impact. They

Renewable electricity in rural Afghanistan

Electricity is rare in rural Afghanistan. The central government and local authorities do not have systems in place to supply electricity to rural areas.

A Tearfund partner is working in a north-eastern province in Afghanistan. It is one of the poorest and least accessible areas of the country, though it is very beautiful. The rough roads are often impossible to travel on, and sometimes flooding washes away bridges. Working with community members, Tearfund's partner has installed 325



Tearfund's partner has installed 325 micro-hydro plants in rural Afghanistan.

micro-hydro power plants over many years. Micro-hydro plants generate electricity from flowing water.

One of these micro-hydro plants is in Sher Jan's community. He is the cheerful village elder and head teacher of the local school of 900 children. When asked what difference the new micro-hydro power plant and electricity supply had made to his community, he replied, 'Before, we were in darkness. Now we have light, just like Tajikistan!'

Previously, people had used bad-smelling oil lamps, costing each household around £60 a year. Now the electric lighting is highly valued by women for cooking in the evening and for sewing. Children have light for doing their homework after dark. People can work longer. And everyone appreciates electricity for watching TV and keeping up with world news.

In addition, the process of agreeing and installing a micro-hydro plant helps unite the community. Before the Tearfund partner agrees to help install a power plant, all the households in the community have to confirm that they want this. They



Working together on micro-hydro power projects has helped to unite communities.

have to contribute an amount of money that has been agreed between them and the Tearfund partner. They also help to transport the turbine and other parts to their village, normally by donkey because of the lack of roads. A village committee must be appointed and trained to take responsibility for ongoing maintenance of the power plant after installation.

Bruce Clark, Tearfund's Afghanistan Country Representative



In Larcay, Peru, LUTW helped an isolated community to connect 20 homes with PV systems.

do not need to be connected to the national electricity grid, so they are ideal in remote locations. The LUTW systems include a battery to store power for use at night when the sun is no longer shining. The PV system provides electric lights and has an adaptor to connect other devices such as cell phones and radios.

LUTW trains community members, giving them practical skills to install, maintain and repair renewable energy systems. This gives communities the independence to manage systems in their villages in the longer term.

When people value something and feel a sense of ownership, they are more likely to treat it with care. For this reason, LUTW does not donate systems to families. Instead communities contribute financially, provide accommodation for technical staff, attend planning meetings and supply local materials.

LUTW offers various training courses to teach people how to design, install and maintain small PV systems.

*For more information please contact LUTW.
Email: lutw@lutw.org
Website: www.lutw.org*

Biogas digesters

by Joel and Esther Chaney

CREATIVenergie is a new charitable company based in the UK. It provides information and training to communities, helping them to use natural resources to generate their own clean, sustainable energy.

Titus and Naomi are subsistence farmers in the hills of the Kerio Valley, Kenya.

Previously, Naomi cooked on a mud stove and spent a long time each day collecting firewood for cooking.

Titus recently attended a 'train the trainers' biogas course. He learnt how biogas digesters can use cow dung (and other types of dung) to produce clean gas for cooking. During the course, participants built six household biogas digesters. They also learnt how to pass on their knowledge to others. Titus has now built a



Loading dung into a biogas digester.

biogas digester for his family. He plans to set up a small business to share the benefits of biogas in the Kerio Valley.

The biogas digester has brought many benefits to their family. Naomi can prepare food much more quickly and without smoke. The children are no longer at risk from an open fire. The digester also produces a rich fertiliser for crops and vegetables.

The small CREATIVenergie household biogas digesters built in Kenya cost around £165, with larger systems costing £230. Though this may seem expensive, the digesters last for years and need no other source of fuel. The 10-day 'train the trainers' course teaches participants how to teach others to construct and operate a biogas digester.

*For more information on biogas opportunities, please contact CREATIVenergie.
Email: info@creativenergie.co.uk
Website: www.creativenergie.co.uk*

When choosing where to construct a biogas digester, it should be:

- close to the cowshed (where the manure comes from)
- 10-20 metres from water (to mix with manure)
- near the house for piping gas
- not too close to trees, because roots may prove a problem and the leaves create shade.

Considering a renewable energy project?

Adapted from Environmental sustainability (ROOTS 13). See Resources on page 15.

If you are thinking about starting a renewable energy project in your community, here are some things to consider:

- What sources of energy do people use in the community? Are these energy sources sustainable?
- What appropriate technologies are available that can meet the most important energy need? Could local technologies be improved?
- What are the costs of each technology (installation, operation, maintenance and repair)?
- Could the technology be made, installed, maintained and repaired by local people? Could this project be developed into a livelihoods programme, with people supplying the technology to neighbouring communities?
- Are there existing local organisations working on energy provision? If there is none, could you consider employing local consultants with technical knowledge and experience?
- How can the church be involved to make sure the project is sustainable and genuinely meets community needs? Perhaps the church could demonstrate technologies to help the community to choose what would be best, such as installing solar-powered lighting in the church building or local school.
- Will the project be environmentally sustainable?
- What are the risks associated with the project?
- Could you encourage companies from the private sector to set up an energy project? Investigate whether the church could then offer to support them in targeting people in need.
- Could you advocate to local or national authorities to encourage them to supply your community with energy (see pages 6-7)?

An interview with the Eco-bishops



The Eco-bishops in South Africa.

Tell us about the Eco-bishops initiative and how it all started.

The Eco-bishops are a group of Anglican bishops from around the world, speaking out together about climate change. Archbishop Thabo Makgoba (who is Archbishop of South Africa) invited a group of bishops to meet near Cape Town in February 2015. We discussed the responses Anglicans have already made to climate change, and the responses we hope to make in the future.

The bishops were from different areas of the Anglican Communion already affected by various impacts of climate change, such as Fiji, Argentina, New York and Namibia.

Following the conference, we published a statement called *The world is our host: a call to urgent action for climate justice*. It was issued shortly before Good Friday 2015.

How have people around the world responded to this report?

The statement has been broadcast through approximately 100 media outlets around

the world. It has been used in many local churches, dioceses and provinces. The response has been extremely positive.

Anglican leaders are using the statement to call for a stronger, more united response to the climate change crisis. Support from Episcopal leaders (the US Anglican church) has greatly strengthened our voice.

Was people's response to the report what you expected?

The response exceeded our expectations for two reasons. The first was the word 'urgent'. The Anglicans we surveyed wanted us to share a clear, inspiring and urgent message about climate change.

The report raised a second big discussion point: it called for churches to stop investing in fossil fuel industries.

In the report you encourage prayer and fasting in response to climate change. How have people responded to this idea?

A number of bishops and others have committed to the spiritual practice of fasting for the climate, joining with the movements 'Fast for the Climate' and 'Pray and Fast for the Climate'. Many others have joined with Orthodox and Roman Catholic Christians in a World Day of Prayer for the Care of Creation on the first day of September each year.

The report asked for more educational resources for churches on caring for creation. Could you tell our readers about some of these that they may find useful?

We are starting to collect resources on the ACEN website. Here you will find short



The Anglican Communion is the name for the community of Anglicans around the world. In April 2015, the Anglican Communion produced *The world is our host* report encouraging the world's 80 million Anglicans to respond to climate change.

video clips from the bishops and worship resources from around the world. For example, Green Anglicans, a group in South Africa, have developed *Ryan the Rhino* – a 10-week course for children in churches.

You called on political, economic, social and religious leaders to address the climate change crisis. Have they responded?

There have been discussions in Anglican communities worldwide about changing the way we invest our funds. Many have now promised to stop investing church funds in fossil fuels (including the World Council of Churches; the Anglican Dioceses of Canberra, Melbourne and Perth, Australia; and the Episcopal Diocese of Massachusetts, USA). The Anglican Church of Southern Africa is discussing ending its investments in fossil fuels. This is the first time the region has considered this, and it is a direct consequence of the report. Currently South Africa has the dirtiest electricity in the world, as it is often produced from lower-quality coal. The air quality in Johannesburg, South Africa, is 10 times worse than the air quality levels recommended for human health by the World Health Organization.

Archbishop Thabo, what personal message would you like to give to Footsteps readers?

As your name suggests, please walk the talk. Words, words and more words will not reverse environmental degradation or carbon emissions, but our actions together can. So act now for climate justice. Change begins with us!

Websites

<http://acen.anglicancommunion.org>
News and resources from the Anglican Communion Environmental Network. You can download *The world is our host* in English, French, Portuguese and Spanish.

www.greenanglicans.org
Download the children's resource *Ryan the Rhino* (in English only). Click on 'Resources' and then 'Youth'.

TILZ website www.tearfund.org/tilz Tearfund's international publications can be downloaded **free of charge** from our website. Search for any topic to help in your work.



Previous *Footsteps*

Visit www.tearfund.org/footsteps to download previous editions that include material relating to climate change and sustainability.

- *Footsteps 94*: Valuing food
- *Footsteps 88*: Managing disasters
- *Footsteps 85*: Trees
- *Footsteps 82*: Natural resources
- *Footsteps 70*: Agriculture and climate change
- *Footsteps 51*: Water
- *Footsteps 41*: Looking after our land
- *Footsteps 32*: Food security
- *Footsteps 20*: Environment

Environmental sustainability (ROOTS 13)

ROOTS guides help development organisations in their work. This book contains information on natural resources, sustainable energy and advocacy approaches. It also explores biblical perspectives on environmental issues. A basic environmental assessment tool is included. Available in print and online in English, French, Portuguese and Spanish. Visit www.tearfund.org/roots to download this booklet free of charge, or contact us to order a printed copy for £12.



Why advocate on climate change?

This booklet discusses different advocacy tactics to help tackle the problem of climate change at the local, national and international level.

Visit www.tearfund.org/whyadvocate to download this guide, or contact us to order a printed copy. Available in English only.

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To order printed publications, email publications@tearfund.org or write to us by post. One copy may be available free of charge to organisations or individuals who are unable to pay.

Environmental assessment

This tool helps organisations to assess the impact of their individual projects on the environment, and the impact of the local environment on their projects. It will help organisations decide whether they need to change any aspects of a project.

Visit www.tearfund.org/environment to download *Environmental assessment*, or contact us to order a printed copy for £10. Available in English, French, Portuguese or Spanish.

Advocacy toolkit (second edition)

Tearfund's *Advocacy toolkit* is a detailed guide on advocacy and how to do it. Visit www.tearfund.org/advocacytoolkit to download the book free of charge, or contact us to order a printed copy (£20). Available online in English, French, Portuguese and Spanish. Printed copies are currently available in English and Portuguese, and will soon be available in French and Spanish.

PILLARS guides

PILLARS guides are designed to help local groups to discuss the issues they face. To download PILLARS guides free of charge, visit www.tearfund.org/pillars. Printed copies cost £7.

■ Agroforestry

Agroforestry means growing crops and trees together, on farmland or in the forest. It improves soil fertility and helps prevent erosion, and the trees can provide fruit, fodder and fuel. Available in print and online in English and French.

■ Improving food security

This booklet includes practical information on pest control, grain banks and techniques for food preservation and storage. Available in print and online in English, French and Portuguese.



Useful websites

www.practicalaction.org

Practical guides on adapting to climate change, covering agriculture, energy, disasters, water and waste.

www.arocho.org

A Rocha is a Christian environmental organisation working in 20 countries.

www.diaconia.org.br

Diaconia is a Brazilian organisation helping people adapt to very dry conditions. You can download practical resources (mainly in Portuguese).

<http://acen.anglicancommunion.org>

News and resources from the Anglican Communion Environmental Network.

www.laudatosi.com

Pope Francis has written an interesting letter about the environment and climate change.

<http://www4.unfccc.int/nap/Pages/Shared-NAPs.aspx>

Visit this site to download National Adaptation Plans (NAPs) for lower-income countries. Please note that many NAPs are not yet completed.

<http://publications.cta.int>

The Technical Centre for Agricultural and Rural Cooperation (CTA) publishes guides on agriculture and development.

Up close and personal: children learning about nature

by Angela McKay and Camille Allan

A Rocha is a Christian wildlife conservation organisation working in 20 countries.

A Rocha Peru believes that helping children to engage with the natural world around them is vital for conserving the environment. All of A Rocha Peru's conservation projects include Environmental Clubs, which encourage young people to get involved with nature in a 'hands-on' way. The clubs help them learn how to care for their environment, while also developing independence and self-esteem.

A Rocha India works with a group of blind and partially-sighted young people living near Bannerghatta National Park. A team took them into the forest. Here, they had the opportunity to listen to bird songs; feel and smell different plants, soils and stones; and sniff fresh piles of elephant dung! Afterwards, the young people were each

given a model elephant to explore by touch. They then made their own models, creating a wonderfully varied herd.

Children with **A Rocha Uganda** and **A Rocha Ghana** collect seeds from native trees and prepare seed beds. They then plant the seeds and care for them until the seedlings have grown enough to be planted out around their school or homes. The seedlings are transplanted into pots made from recycled plastic water containers, helping to reduce litter. The children watch them grow into trees that are useful in many ways – providing shelter and food; improving the soil and helping it stay moist; and for use as timber for furniture or building.

Angela McKay is A Rocha International's Environmental Education Coordinator (angela.mckay@arocha.org) and Camille Allan is National Director of A Rocha Peru (camille.allan@arocha.org). Visit www.arocha.org to learn more about the work of A Rocha.



Children in Peru are learning how to grow tree seedlings with A Rocha.

Ramón Casana Araujo/A Rocha Peru

More activity ideas

by David Melville

THREATS TO WOODS AND FORESTS

Show young people photographs or drawings of threats. Encourage them to work out what is happening in each picture. Examples might include:

- building houses or roads
- poaching
- killing animals for bushmeat (meat from wild animals, which may be rare species)
- fires from smoking out honey bees
- mining
- harvesting bamboo and timber.

This activity can be used for all sorts of other issues – such as soil erosion, deforestation or pollution. Use role plays to bring the issues to life.

LEARNING NAMES

Prepare photographs or drawings of local birds and animals with separate cards giving their names in the national and local languages. Play games that encourage the children to learn the names of all the creatures.

LOCAL FIELD TRIP

Take young people out to a nearby area and ask them to walk in pairs, with one observing and the other recording on paper all the things they notice. Later, ask them to share with each other what they saw.

David Melville is an Environmental Officer for A Rocha UK. He is writing of his experience with a Rwandan school through its link with Trinity Church, Southover, Lewes. Email: djmelville77@btinternet.com

How can we encourage the next generation to grow up to care deeply about this precious creation?

In La Libertad, along Peru's northern desert coastline, A Rocha is restoring dry forest. This is one of the most endangered ecosystems in the world. Here, A Rocha has set up two Environmental Clubs. Members actively take part in project activities, such as producing and planting native Prosopis trees (known locally as Algarrobo).

Other activities and projects include:

- visiting places of environmental interest
- creating green areas in their town centres
- growing vegetables at their club house
- recycling and reusing plastic waste
- carrying out informative community events.

Club members develop a deep appreciation and responsibility for their environment. They raise people's environmental awareness, particularly regarding their community's commitment to conserve the dry forest.

Melanye Atocha Gamarra is a 14-year-old club member. She explains, *'Through the club I have learnt not only to grow plants and take care of the environment, but also to relax, unwind and grow as a person. I like being part of the club because I can be in contact with nature, have a cleaner environment and contribute to my community.'*