

WATER

Rich Living



AOTEAROA NZ
ROCHA
Conservation and Hope

Acknowledgements:



The Rich Living project and materials were produced with funding from and in partnership with Tearfund New Zealand. Tearfund's mission is to encourage New Zealanders to act for justice to relieve poverty among the world's most vulnerable people.



Thanks also to our long-term partner Fusion Print.

To order:

For further copies of this publication and other booklets in the Rich Living series:

<http://www.arocha.org.nz/education-engagement/rich-living>

Email: new.zealand@arocha.org

Published by A Rocha Aotearoa New Zealand

A Rocha Aotearoa New Zealand
c/- Hamilton Environment Centre
PO Box 19104
Hamilton 3244
New Zealand

© 2017 A Rocha Aotearoa New Zealand
978-0-473-41315-6 (Softcover), 978-0-473-41316-3 (PDF)

For further information about the work of A Rocha please contact us

email us: new.zealand@arocha.org

visit our website: www.arocha.org.nz

or visit our Facebook page: www.facebook.com/ARochaNZ/

Written by: Dr Andrew Shepherd

Illustrations & Layout: Rachel Doragh – Wairua Design



Photo Credits: Andrew Shepherd, Rachel & Mike Doragh, Helen Manson and Jens D'Haeseleer.

Rich Living:

Making sustainability integral to lives of faith



We live in a remarkable period of human history with standards of living and life expectancy higher than ever before. And yet, there is a lot of evidence that our levels of consumption are unsustainable. Our Western lifestyles are destructive to the systems that are vital for life on our planet.

Jesus stated that the greatest commandments were ‘to love God and love your neighbour’ (Matthew 22:37-39). However, consciously or unconsciously, we participate in a way of living that often contributes to the pollution of our atmosphere, the poisoning of our oceans and waterways, and the degradation of our land – this has a negative impact on our local and global human and non-human neighbours.

Pieter Bruegel the Elder’s 16th century painting depicting the *Tower of Babel* (Genesis 11:1-9) captures something of our current plight. In building a civilisation that strives to reach ‘into the heavens’ we have become more and more disconnected from the earth from which we are formed and upon which the tower’s structure is dependent!

But it doesn't have to be this way. Across the world, facing the challenges of ecological degradation, global climate change and growing economic inequality, communities are choosing alternative, more sustainable, ways to live.

Christians too, are to be agents of hope. Another 16th century painter, Paolo Veronese, offers a contrasting vision in his *The Wedding at Cana* (John 2:1-11). Jesus takes the elemental gift of water and utilises this for the purpose of a joy-filled community celebration (water into wine!). This is a picture of the 'life in abundance' that Jesus says he comes to offer (John 10:10).

At A Rocha, we believe that Christian faith communities have the potential to offer glimpses of authentic 'rich living' – living in sustainable ways that care for the long-term wellbeing of our broader communities, composed of human and non-human neighbours.

This booklet is one of five in the Rich Living series – *Climate Change, Water, Food, Transportation, Stuff & Waste*. Designed for small groups of participants, each booklet consists of four studies (45-90 minutes in length) incorporating information, Scripture readings, discussion questions and practical activities. It is our hope that this material will assist your community to reflect upon how you live and offer practical steps to make sustainability integral to your lives of faith.

Would you like to see how the Rich Living resources are shaping the lives and actions of others? You can share your photos, reflections and new practices at: www.facebook.com/groups/ARochaNZ.RichLiving/

We look forward to seeing the practical steps your community is taking towards sustainable – and genuinely rich – living.

Study 1 – Water : The Gift of Life

‘Water is the driving force of all nature.’

Leonardo Da Vinci



Living Water

Water is fundamental to life on our planet. In some organisms, 90% of their body weight is composed of water. An adult human’s body weight is 60% water. Water is integral to human societies – we use it for drinking, cooking, washing, irrigating crops and livestock, and for recreation and rituals. Indeed, water is a biological necessity – after 3-5 days without it, essential functions within the human body begin to shut down. Water is, literally, life!

In Aotearoa New Zealand we often take water for granted. We live in a temperate country surrounded by ocean and get a lot of rain. The Cleddau Valley, to the west of Milford Sound, has an estimated

average annual rainfall of 13.4 metres and is one of the wettest places in the world. Most of us live in urban contexts and don’t experience these deluges of mountain rainfall – sometimes up to 250mm in 24 hours! – but, nevertheless, in our well-watered land, rivers, streams and lakes are never far away.

In this booklet we’ll be reflecting upon how we can use water wisely and more sustainably – for the richness and wellbeing of our lives and also that of our human and non-human neighbours.

NZ receives about 560,000 million m³ of rain and snow annually – enough to cover our entire land mass 2.1 metres deep in water!

The Blue Planet

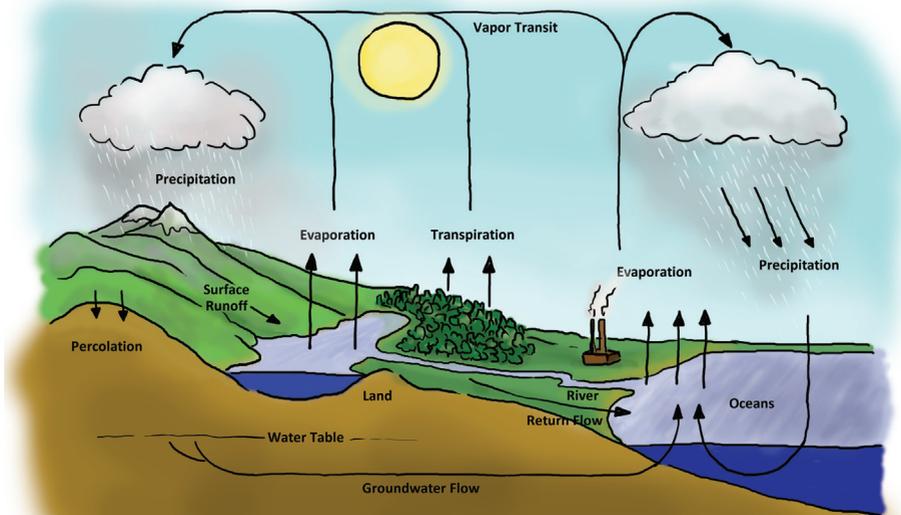
Some suggest it's a misnomer for our planet to be called Earth. We live on a blue planet with 72% of the surface covered in water. However, only a small percentage of this water is accessible for human consumption.

- 97.5% of the water on our planet is saltwater in our oceans
- 2.5% is fresh water.

Of that 2.5% of freshwater

- 70% is locked in the ice caps near our polar regions
- 30% is groundwater
- 0.3% is surface water (lakes, streams, rivers)
 - visible and readily accessible.

The amount of water on Earth always remains the same as it moves endlessly through the water cycle. Accordingly, water is technically a renewable resource, because it can be used over and over again.





Activity: Contemplative Reading of Scripture

That we are composed of water, surrounded by water, and dependent on water for our existence is a theme that occurs throughout the Biblical narrative. We usually read Genesis 1 & 2 focussed on the creation of land and creatures (particularly humans). But have you ever noticed the significance of water in these passages?

Read Genesis 1:1 – 2:14 (If possible, do this beside a waterway or body of freshwater). Have one person read the passage out slowly. Become aware of the place/role of water in these creation accounts.

- What images are brought to your mind by the phrase ‘darkness covered the face of the deep, while a wind from God swept over the face of the waters’; and ‘a stream... [to] water the whole face of the ground.’ [1:2; 2:6]?
- What is the significance of the waters and the ground being given a face?
- 1:20-23 contains imagery of waters ‘teeming with life’. Some of you may have experienced this through swimming around coral reefs or in marine reserves. Share your emotions.
- In Genesis 2, what relationship does the author draw between the presence of water and the emergence of humanity?

The 19th century British scientist Alfred Russel Wallace referred to the Earth’s atmosphere as ‘the Great Aerial Ocean’. Indeed, according to the creation accounts in Genesis, we are enveloped by water above and below (1:7). The waters above – the sky – are populated by avian creatures, the waters below – the sea – by marine creatures. And we – earth creatures (2:7) – reside in our own habitat; one of abundance, sustained by life giving rainfall and streams of fresh water (2:5-6).



Water: An unlimited resource?

While technically water is endlessly renewable, only a small amount within the water cycle is accessible and available for use. For most of human history, water was drawn from surface water (the 0.3%) or from relatively shallow wells, and even then, used sparingly. However, over the last two centuries, human water use has changed dramatically.

Firstly, our water-take has increased exponentially. This is due to a rapidly rising human population and also because the amount of water used per person is increasing.

Secondly, through technology, we have gained access to deep underground aquifers. Some of these aquifers replenish over relatively short periods of time. But fossil aquifers – like the fossil fuels (coal, oil, gas) that power modern-day civilisation – have their origins long ago and are regarded as nonreplenishable. These fossil aquifers – often composed of the meltwater of ice age glaciers from 25,000-15,000 years ago – once used, will take millennia to refill. The decline of these ancient waters will have major consequences for the human populations who depend on these water sources.

While not as ancient, much of the water in aquifers around Aotearoa New Zealand has been underground for centuries. Under the Canterbury plains, vast underground cisterns have been filled as rainfall and water from braided rivers has percolated down into them. Whether replenishable or



nonreplenishable, the key issue is whether our water withdrawal is sustainable – that is, whether we are giving sufficient time for these underground reservoirs to refill or whether we're leaving them empty for later generations.

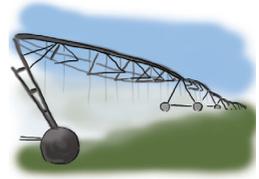
During the 20th century:

- There was a six-fold increase in per capita water use.
- Human water withdrawals were more than all previous human history.

Globally, human demand for water is increasing by 64 million m³ each year.

Utilising Water

Hydrologists use the term water withdrawals to describe the water that humans take or divert from the water cycle. So what do we use this water for?



- 70% goes to agriculture
- 22% goes to industry (e.g. manufacturing)
- 8% goes to domestic use

While this amount varies in different contexts (for example, Western nations tend to use more water for industrial purposes), the above is the basic ratio worldwide.



Hydrologists distinguish between non-consumptive and consumptive uses of water. A non-consumptive use is where water is withdrawn from a watershed temporarily and then returned. For example, where water is taken from a river for a hydropower dam or used for cooling in a factory and then returned downstream.

Consumptive use is where water is removed from its source and is not returned to this body of water. The most consumptive use of water is agriculture. Water is utilised in modern-day agriculture to produce the pasture, grains, fruit, vegetables and meat that humans and livestock consume. In this process, large amounts of water either evaporates or returns to surface or ground water – therefore affecting the availability of water from this original source. Also of importance is the quality of the water being returned to the water cycle... an issue we'll explore later.



Reflect & Discuss

- Were you surprised by the statistics on what we use water for?
- How does it make you feel that the water that you used today – has for millennia worked its way through the water cycle? – may not be available again for human use for centuries?
- Do you feel you take water for granted?

Water as Gift

While the Bible is full of water imagery, it was written in a dry Middle Eastern context – where rainfall differs radically from Aotearoa New Zealand! The Old Testament recounts how in the wilderness the people of Israel depended upon the miraculous provision of water by the LORD to sustain them (Exodus 13-17 and Numbers 20:1-13). That water is a gift, an expression of God’s sustaining care, is a theme that occurs throughout the Bible.

*He turns rivers into a desert,
springs of water into thirsty ground,
a fruitful land into a salty waste,
because of the wickedness of its inhabitants.
He turns a desert into pools of water,
a parched land into springs of water.
And there he lets the hungry live,
and they establish a town to live in;
they sow fields, and plant vineyards,
and get a fruitful yield.
By his blessing they multiply greatly,
and he does not let their cattle decrease.*

Psalm 107:33-38 (NRSV)

Because Aotearoa New Zealand is a developed country we tend to take access to water as a given. We turn on a tap and clean drinking water flows out. This is not the case in large parts of the world. For millions, clean water is a scarce resource and accessing it is a daily chore involving considerable time and energy. In many rural areas of Africa and Asia, women and young children (usually females) walk an average of 6km per day to collect water for their household, often carrying 20+ kg of water on their return trip. Not only is this back-breaking work, but the time and energy spent collecting water impinges on women’s and children’s education opportunities. Because the education of women is closely linked to economic growth, the lack of access to water impacts the wellbeing of the whole community.





Reflect & Discuss

- Describe a situation when you've been incredibly thirsty? How did this make you feel – Physically? Mentally? Emotionally?
- Can you imagine walking 6km every day in high temperatures carrying heavy loads of water?
- To what extent do you think of your access to water as being dependent upon God's gracious provision?



Activity: Read Scripture

Read Isaiah: 41:17-20 slowly and reflectively.

- What emotions does the passage evoke in you?
- What role and responsibility as followers of Christ do you think we have to ensure the 'poor and needy' have access to water?



Activity: Local Knowledge

This week trace the journey of the water that flows through your taps at home/church. Illustrate this journey through a drawing or a process chart and bring to share with others next time.

- How is your water gathered?(Rainfall from roof? From lakes/streams? Drawn from underground?)
- What infrastructure went into gathering this water for you? (Dams? Reservoirs? Pipes? Canals? Water tanks?)
- Who ensures that this water reaches you safely?
- What other species depend upon water from this watershed for their life?



Activity: Pray

- Pray for those within your community / city who are responsible for the clean water you have access to.
- End your time together with a period of silent reflection. Then, pass around a glass of communal drinking water. After each person takes a sip, invite them to offer a short prayer in response to what you have read and discussed. Finish by saying the prayer of St Francis together.

*Praised be You, my Lord,
through Sister Water
who is so useful,
humble,
precious,
and pure.*

From 'The Canticle of the Sun'
(St. Francis of Assisi)



Activity: Bringing it Home

In this study we've seen that (i) water is essential to life; and (ii) many in the world do not have access to clean water. We've also noted to the extent to which we may take the gift of water for granted. The activities below are designed to help us empathise with our global neighbours who live with water scarcity and to develop in us an attitude of gratitude for the gift of water.

- This week, restrict your access to only one tap in your household for a day (or the whole week). Utilise this tap for all your daily domestic requirements (drinking, cooking, laundry, personal hygiene).

or

- Fill a single 25-litre container with water and use this water for your daily domestic requirements. Do this for one day, or refill the container each day for the whole week.

and

- Write a short prayer of thanksgiving for the gift of water (or use St Francis' prayer above) and place it beside the tap you are using. Offer this prayer each time you use the tap.



Study 2 – Water Under Threat

Previously we looked at how essential water is to our lives. Aotearoa New Zealand is fortunate – relatively speaking, we have access to lots of freshwater.



Watch

Blue Lake Video (4:48 mins)
(see: <https://vimeo.com/233260977>)

A good land, a land with flowing streams, with springs and underground waters welling up in valleys and hills... a land where trees planted by streams of water yield their fruit in season and do not wither.

Deuteronomy 8:7; Psalm 1:3



Reflect & Discuss

- What emotions were evoked by this video?

Freshwater – Diminishing & Deteriorating

While water seems abundant, the reality is that it is an increasingly threatened resource – both globally and in Aotearoa New Zealand. Three factors threaten the availability of water to human and non-human communities which depend on them for their survival:

- *Our unsustainable use of water*
We are withdrawing too much water from the water cycle and not giving sufficient time for the sources of water (streams, lakes, aquifers) to be replenished.
- *Our patterns of living*
Modern agricultural methods and our modern industrial and urban way of living is polluting and contaminating freshwater sources.
- *Anthropogenic climate change*
Climate change, exacerbated by human activity over the last two centuries, is leading to significant changes in rainfall distribution, frequency and volume.

Let's look at these factors in more detail.

Modern industrialised societies are consuming more water than previous human societies. Water withdrawals during the 20th century were more than all previous human history put together, and globally the demand for water is increasing by 64 million m³ (cubic metres) each year. Our global water use is unsustainable.

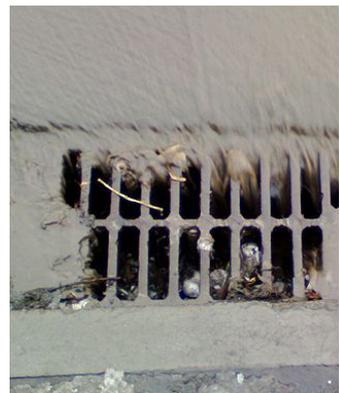
Nor is this pattern of increasing water use confined to other countries. In Aotearoa New Zealand, we're withdrawing more and more water from our rivers, lakes, streams and aquifers and the water that is being deposited back into the water cycle is declining in quality.

So, what are some of the activities that cause damage to our waterways?

Concrete

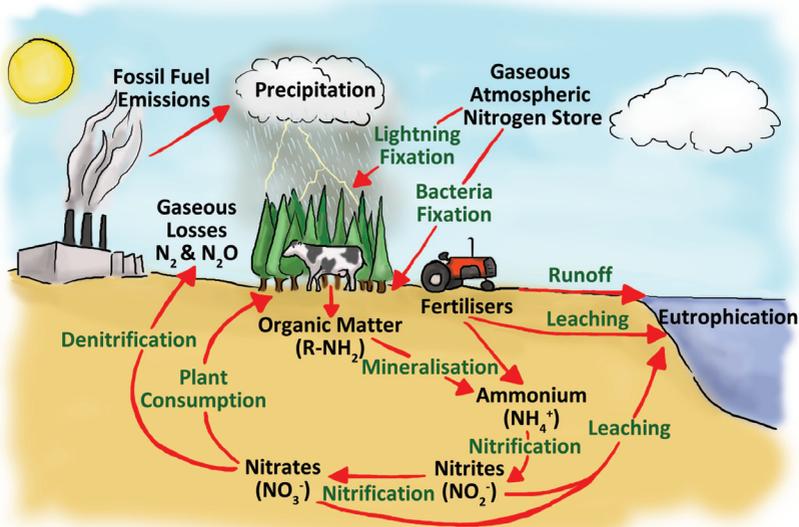
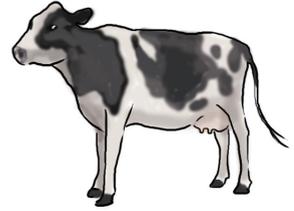
A lot of water pollution globally and in Aotearoa New Zealand comes from urban runoff. As well as industrial discharges, modern living produces lots of water pollutants (e.g. toxic metals from our roofs, the brake linings of our vehicles; hydrocarbons from oil and fuel). Because we've paved our towns and cities with hard surfaces, pollutants no longer get filtered through the ground (where bacteria deal with lots of the toxins). Instead, the water makes its way directly into our waterways which are often now out of sight and out of mind, piped underground.

- NZ has the second highest water use per capita of all OECD countries. (OECD 2007 Report)
- National weekly water allocation has increased by ½ between 1999 and 2010. If the water taken for the Manapouri Power Station – that powers Tiwai Point aluminium smelter – is excluded, then water allocation has nearly doubled since 1999.
- 75% of NZ's total water allocation is used for agricultural and horticultural irrigation.
- 60% of all water used in NZ is now used in the Canterbury region (21.5 million m³– 8600 Olympic swimming pools – per day). 86% of this is used for agricultural irrigation.



A land flowing with milk & honey?

New Zealand faces a dilemma. Our economy is based upon primary industries. We're the world's largest dairy exporter and make our living by turning water into milk, wool, meat, timber, and, akin to Jesus, into wine! The intensification of many of these industries over the last 20-25 years has contributed to economic growth and increased New Zealand's wealth. However, the intensification of farming has also come with significant environmental impacts.



Every cow in New Zealand produces 23 litres of urine a day. In 2015, there were 10.0 million cattle (6.5 million dairy). This means that each day 230 million litres of bovine urine is added to the land –and this doesn't account for the 30 million sheep, deer and calves who also need to urinate! Once this urine is in the soil, bacteria breaks down the urea in the urine to ammonium, then into nitrites and finally nitrates.

Nitrogen is an element essential to all living things (to make DNA, amino acids and proteins). But plants can only absorb so much. The rest leaches off into groundwater and waterways where it can have a negative impact on the health of both human and non-human communities.

Eutrophication

Nitrogen increases fertility, meaning that plant and algae thrive. This is good on farmland but is an unhealthy situation in water. Abundant aquatic plant-life clogs waterways – impacting on human recreational activities – and also robs oxygen from waterways thus suffocating aquatic creatures. High levels of dissolved nitrates also stunts development and reproduction of aquatic invertebrates and fish and at high enough levels, can kill them.

Eutrophication comes from the Greek: *eutrophia*.

eu 'well' + *trephein* 'nourish'.

(i.e. Our over-nourishing of our waterways is ultimately killing them).



Extraction and Pollution

Globally, one of the huge threats for freshwater is the pollution that stems from large-scale extractive industries, especially oil and coal. One illustrative example of this is the enormous Alberta Tar Sands industry in Canada. Here, ancient boreal forests (which, like all the world's forests, take carbon out of the atmosphere) are being cut down and the ground mined to access bitumen tar.

- For every one barrel of oil produced:
 - four tons of sand and soil are removed and dumped
 - three barrels of water are required

A 2010 NIWA report assessing major NZ rivers between 1989-2007 reported a major decline in water quality with both nitrogen and phosphorus levels up across country. These figures correlated with two decades of:

- the increased use of nitrogen fertilisers
- the intensification of dairying (more cows per hectare)

- 370 million m³ of water is taken from the Athabasca River each year.
- 90% of this water never returns to the river, but ends up in enormous tailing ponds, covering 176km² - with enough liquid to fill 390,000 Olympic-sized pools!
- Nearly 1 trillion litres of contaminated water now sits behind these giant man-made dams, with some each year leaking into waterways and seeping into groundwater. Mining companies are still working out how to decontaminate all this water.

The use of fresh water for extraction of fossil fuels is not confined to overseas. In New Zealand, mining, drilling and fracking (for coal, gold, and gas) also uses significant freshwater. While strict rules are in place to protect the environment it seems irrational to use the precious gift of water to produce even more fossil fuels for burning. These extractive activities devastate places sacred to indigenous people and impact the lives of local communities and thousands of species now, and long-term, the burning of these fuels will further exacerbate climate change, impacting future generations.



Climate Change and Water

As well as the challenges to water quality, climate change will have an impact on future water availability. As the Earth's atmosphere warms so does its capability of holding water vapour, which then falls as rain. Modelling by climate scientists suggests that increased average global land and sea temperatures will give rise to strong westerlies in New Zealand. The west (already wet) will get wetter, the east – where most of our pastoral farming is done – will get drier, especially in winter and spring. Also, rainfall will become more sporadic, with an estimated 32% increase in extreme rainfall. Heavy rainfall on dry land will potentially lead to a higher likelihood of destructive flooding – with significant impact on both farm animals and human communities. (For more on this, see the 'Climate Change' booklet in the Rich Living series).

So, what are some of the consequences of this changing availability and declining quality of water in some regions of Aotearoa New Zealand?

Water, Recreation & Mental Wellbeing

Previously we discussed the importance of clean water for physical health. But water is also important for human mental wellbeing. Psychological and neurological studies have demonstrated that being in water and even the sound of running water lowers stress levels and increases a sense of relaxation. The soothing and healing properties of water shouldn't surprise us, after all, we all spent our first nine months surrounded by water in our mother's womb.

*You, Lord, are my shepherd.
I will never be in need.
You let me rest in fields
of green grass.
You lead me to streams
of peaceful water,
and you refresh my life.*

Psalm 23:1-3 (CEV)



As an island nation, surrounded by oceans and with an abundance of freshwater, swimming, boating, fishing, and other recreation activities are integral to Kiwi culture. The level of public furore after the release of a new National Policy Statement for Freshwater Management (containing a definition/redefinition of 'swimmable') in February 2017, illustrates the value we place on water for recreation.



Watch

Mad Love for Freshwater (4.08mins)

<https://vimeo.com/230518594>

This light-hearted video has a serious message. It was produced by a freshwater ecologist and Environment Canterbury Councillor in the run-up to the 2017 NZ General Elections to draw attention to the threats facing New Zealand's freshwater.



Reflect & Discuss

- How does water play a part in your mental and emotional restoration and wellbeing? (A bath/shower? Swimming? Surfing? Fishing?)
- Share how these experiences of water restore and refresh you?
- If, due to scarcity and/or deterioration of water you couldn't engage in these activities how would this impact your wellbeing – physical, emotional, mental?

Wetlands & Freshwater Species

In Study 1 we noted in Genesis 1:20-23 the description of 'waters teeming with life'. Previous generations in Aotearoa New Zealand – tangata whenua and early Pākehā settlers – made frequent mention of the profusion of bird-life and also the abundance of freshwater species – crayfish (koura), long and short-fin eels, and a host of native fish all thrived in waterways/wetlands across the country.

Within Aotearoa New Zealand we are proud of our weird and wonderful birds (they feature on our money so we obviously value them). While aware of the ongoing threat that our native bird species face due to habitat destruction and introduced predators, most New Zealanders are oblivious to the threats to aquatic biodiversity. Aotearoa New Zealand has 40 native freshwater fish species.

- Two thirds of these species are classified as either 'at risk' or 'threatened'
- Four out of five NZ whitebait species are endangered
- In 2013, one third of our freshwater invertebrates were classified as 'at risk' or 'threatened'

- Prior to the arrival of Europeans, wetlands (including rivers and lakes) occupied 20% of the total land area of Aotearoa. This figure is now 2%.
- 90% of our wetlands have been cleared in 200 years!
- Wetlands are crucially important – they provide erosion control, purify the water that passes through them (they are the kidneys of our land) and provide a nursery habitat for many aquatic species.

Threats to Native Fish

- If we take too much water we rob freshwater species of their home. They've nowhere else to live!
- Half of our native fish species spend time at sea. Their migration between the sea and their freshwater habitat is often blocked by dams and badly made or maintained culverts.
- Wetlands and small streams are a favourite habitat for New Zealand native fish, but these areas are shrinking rapidly (mainly due to the intensification of agricultural activities).
- Many introduced fish species out-compete or prey upon our native fish for food and space and diminish water quality.
- Pollutants such as sediment and some household products (detergents, pharmaceuticals), as well as the urban runoff described above, poison our waterways.



Reflect & Discuss

- How many of NZ's native birds can you name? How many freshwater fish species can you name? What do you think accounts for this difference?
- Were you aware of the threats that NZ freshwater fish species face? Should this be of concern to Christians?



Activity

There are a number of ways you can be involved with freshwater fish conservation efforts. Check out: <http://www.doc.govt.nz/nature/native-animals/freshwater-fish/you-can-help/>



Activity: Read Scripture

Read Hosea 4:1-3 & Proverbs 4:23

What do you think of Hosea's diagnosis that links an ignorance of God and broken inter-personal relationships with environmental destruction? What relationship does the author of Proverbs see between our internal lives and our external actions ?



Reflect & Discuss

New Zealand faces something of a conundrum. Our economy depends upon export dollars from our agricultural industry exports. However, our current methods of farming are harming our waterways. Do you think this dilemma is solvable? If so, how?

There is a 'clear link between expanding dairy farming and increasing stress on water quality.... New Zealand does face a classic economy-versus environment dilemma.'

Dr Jan Wright (Parliamentary Commissioner for the Environment), *Water Quality in New Zealand: Land Use and Nutrient Pollution* (Nov 2013)



Activity: Pray

Farmers play an important role in Aotearoa New Zealand both economically and as the people with responsibility for much of our land. Pray for farmers you know – that their farming practices will be productive and bring wellbeing to livestock, land and waterways.



Activity: Bringing it Home

- Where is the nearest waterway (stream, river) to your house? To your church? Do you have access to this waterway?
- Arrange to walk the length of this waterway from its source to its end. If possible, locate a freshwater scientist from within your faith community, a local conservation group or university. Work with the scientist to assess the quality and health of the waterway.
- What state is the waterway in, with respect to: Rubbish? Erosion? Water quality?
- What species are present in the waterway?
- Do the buildings along the waterway face or have their backs to the waterway? What might be the significance of this?
- Are there community or conservation groups involved in caring for this waterway? Could you or your faith community be involved either in assisting in this, or in initiating a community project for this purpose?

Study 3 – The Politics of Water

‘Water belongs to us all. Nature did not make the sun one person’s property, nor air, nor water, cool and clear.’

The Metamorphoses of Ovid
(Trans. Michael Simpson)



Fresh water is essential to New Zealand’s economic, environmental, cultural and social well-being. Fresh water gives our primary production, tourism, and energy generation sectors their competitive advantage in the global economy. Fresh water is highly valued for its recreational aspects and it underpins important parts of New Zealand’s biodiversity and natural heritage. Fresh water has deep cultural meaning to all New Zealanders. Many of New Zealand’s lakes, rivers and wetlands are iconic and well known globally for their natural beauty and intrinsic values.

Preamble to New Zealand’s 2014 National Policy Statement for Freshwater Management.

Thus far we have explored the fact that:

- water is life and a gift
- globally and in Aotearoa New Zealand freshwater is facing significant challenges.

In this study, we’ll reflect on the politics of water. Who owns water and who decides how we will use and protect it?



Reflect & Discuss

When you think of the value of water, which of these categories – economic, environmental, cultural and social wellbeing – do you tend to give priority to?

Which of these categories do you tend to ignore? Why do you think this is?

Valuing Water

Pressure on freshwater resources is leading to increased conflict globally and in Aotearoa New Zealand. At the heart of the conflict are important questions: Who has the access to and rights to management of water? Is water a resource that can be owned and then used and/or sold for private financial gain, or is it a public good?

Currently in Aotearoa New Zealand common law dictates that naturally flowing freshwater is treated as a public good – that is, ‘no one owns the water’. Water is allocated under the Resource Management Act (RMA) with the water take usually set to a daily and/or annual amount. (Usually there is also a minimum flow limit attached to the water body, to ensure that not too much water is removed from the source at any one time). This means that with water charges, one isn’t paying for the water per se, but rather for the infrastructure and management oversight – i.e. a charge for local councils to maintain water pipes; resource consent and monitoring fees paid to regional councils. (Confusingly, this water charge is often based on a per-litre rate!)

A ‘public good’ is a term used in economics to describe a product/resource that one individual can consume without reducing its availability to another individual and from which no one is excluded.

Water as a Commodity

The steadily increasing demand for water allocation in Aotearoa New Zealand – for agriculture, horticulture, hydropower, and bottling – has led to intense discussion and debate around questions of water access, management and ownership. That both corporations and private individuals are making profit from a public resource while the public is having to pay the



- 73 companies around New Zealand have consent to take between them 23 billion litres of water annually – to bottle and sell.
- These companies pay on average an annual fee of \$200 each. This is equivalent to \$0.003 per m³ water (1000 litres).
- Ratepayers are charged \$0.70 to \$3.00 per m³ for water from their local supply.

environmental costs of localised scarcity and reduced water quality, has led to the suggestion that we move towards viewing water as a commodity – one that needs to be paid for. Understandably, neither bottling companies, nor farmers and horticulturalists, (particularly those who rely on irrigation) are overly supportive of this idea. Māori, as we'll discuss below, are also unhappy with this idea.



Reflect & Discuss

- Do you think water can be owned?
- Do you think putting a \$ value on water increases or decreases its value?
- What are the advantages and disadvantages of viewing water as a commodity that can be bought and sold?
- Do you think putting a \$ value on water might lead to better care of our waterways ?

The UN General Assembly

Reaffirming the responsibility of States for the promotion and protection of all human rights, which are universal, indivisible, interdependent and interrelated, and must be treated globally, in a fair and equal manner, on the same footing and with the same emphasis . . .

Recognizes the right to safe and clean drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights;

Resolution 64/292 adopted by the UN General Assembly on 28 July 2010

Water as a Human Right

In contrast to the idea of water as a tradeable commodity is the idea of water as a fundamental human right. Recently Catholic ethicists have argued that access to clean water is as much a moral issue as other 'right to life' issues such as abortion & birth-control.



'without water, life is threatened. Therefore the right to safe drinking water is an inalienable right.'

Pontifical Council for Justice and Peace, *Compendium of the Social Doctrine of the Church*, chapter 10, no.485



Activity: Read Scripture

Read Isaiah 21:13-15 & 55:1-2

In this first passage the nomadic desert wanderers of Arabia are instructed to offer water to refugees fleeing from regional conflict. Here, and elsewhere, the Bible seems to offer the principle of water as one of the 'goods of creation' – a resource that is to be made available for all, regardless of their background or ability to pay.

Consider the story of Mama Mary and her 18-month old daughter, Sunday.

I came to Uganda from South Sudan because of the war. I would wake up in the morning and see people that had died during the night. People with their throats cut, others with gunshot wounds. We had to run to Uganda. When we arrived Uganda opened their doors to us with one heart but nowadays we have a big problem with water. In one hour after a water truck fills the tank it can run out. That's because about 700 people rely on this tank for water. We use the water tank to drink water, wash our clothes, cook food, bath, clean our dishes, water the crops and brush our teeth. But we never have enough. Lately each person has been given only 1.2 litres of water per day to do all those things with. Water is our life.



Reflect & Discuss

- What do you think of the idea of water as a fundamental human right?
- Do you think of access to clean drinking water as a ‘right-to-life’/moral issue?

In Aotearoa New Zealand, disagreements over water allocation and the care of waterways are expressed in strong passions and court cases. In other countries, conflict over water resources often leads to violence. Many believe that future global conflict will be focused more on access to water than on fossil fuel resources. Many of the conflict hotspots in the world today are in areas of water scarcity and/or involve an upstream country and a downstream one – with greater power (obviously) in the hands of those upstream.



Activity: Read Scripture

Conflict over water is not a new reality.

Genesis 26:1-33 & John 4:1-42 are two biblical narratives that revolve around water politics.

Read through these passages together and for each story consider:

- Who controls the water resource?
- Who is excluded from water access?
- How is this exclusion practised?
- How is water being viewed?
- Is water being used in a way that brings life and wellbeing to all?
- Is each party dealing with the other in good faith?
Are they being honest and transparent?
- What lies at the heart of some of the misunderstanding (and, at times, deliberate deception) as the participants engage with each other?

Water, Culture & Identity

That water is essential to all life explains why it features so prominently in human cultural and religious myths/narratives. In te reo Māori, when meeting others, one asks – ‘Ko wai koe?’ ‘Ko wai au?’ – usually translated as ‘Who are

you?’ and ‘Who am I?’ The word *wai* means water, and so these identifying questions, translated literally, ask: ‘Of which waterway are you?’ and ‘Of which waterway am I?’

In the biblical narratives above, the participants come from different cultures (Israelite-Philistine; Jew-Samaritan), and likewise, in modern-day Aotearoa New Zealand, different cultural worldviews shape contrasting attitudes and behaviour towards waterways. A *tangata whenua* perspective is particularly evocative. Within a Māori worldview, waterways are *tupuna* (living ancestors). For *iwi* (tribes) based around rivers for generations, their human identity and wellbeing is inextricably connected to that of the waterway.

A well-known *whakataukī* (proverb) that originates from the tribes around the Whanganui river states: ‘*Ko au te awa. Ko te awa ko au.*’ ‘I am the river. The river is me.’



In 2012, a Waitangi Tribunal decision found that in some cases Māori had ownership rights to water. While the NZ government argues that ‘no one owns the water’, Māori would assert that as *kaitiaki* they have guardianship of waterways. Rather than the negative statement – ‘no one owns the water’ – some, like Professor Dame Anne Salmond, have argued we need to state this positively: ‘we all own the water’. For Salmond, affirming our shared ownership of water recognises the second, often neglected, aspect of the common law principle – that one person’s use of water must not disadvantage another. Affirming our shared ownership of water also brings with it a shared responsibility to care for it.

In August 2014 the Crown signed a deed of settlement with Whanganui Māori covering treaty claims related to the Whanganui River. Te Awa Tupua (Whanganui River Claims Settlement) Act 2017 recognises the ancestral Whanganui River as a legal person with all the rights, powers and duties of a person.



Reflect & Discuss

- How might a Māori understanding of waterways as living ancestors influence human behaviour towards these waterways?
- To what extent does this Māori worldview cohere with how waterways (and other landscapes) are depicted in the Bible?



Activity: Local Knowledge

On a large sheet of paper note down the different groups with an interest in water in your region (e.g. farmers, scientists, fishermen; recreational boaters, conservationists, Māori).

- What are their cultural values?
- What are their needs regarding water?
- What are their attitudes towards water?
- What are the similarities and differences between each group?
- Are the differences reconcilable?
- Do Jesus' actions in John 4 provide an example/model of how contemporary water conflict can be overcome?



Reflect & Discuss

- How is freshwater utilised in your region?
 - How much of this water is used consumptively vs non-consumptively?
- Do you know of communities whose access to clean water is jeopardized?
- Whose activities are leading to this decline of water quality?
- In Aotearoa New Zealand, waterways are managed by Regional and District Councils. Have you or your church or community ever made a submission to your local Council on issues of water allocation and management? Do you see this as an important aspect of Christian witness?



Activity: Bringing It Home

While only a small percentage of water use is for domestic purposes, the quantity of water we are using in our homes is also increasing. Modern conveniences such as flush toilets, washing machines and dishwashers use considerable water.

Typically, inside a New Zealand home, water use is broken down into :

- 30% - baths and showers
- 30% - toilet flushing
- 20% - kitchen use
- 20% - laundry



The average New Zealand household uses between 180 and 250 litres per person per day! Compare this to Mama Mary's story earlier.

Go online and utilise a water footprint calculator to work out just how much water you're using in your household. Try the two listed below (a simple and an extended version):

<http://waterfootprint.org/en/resources/interactive-tools/personal-water-footprint-calculator/>

<http://waterfootprint.org/en/resources/interactive-tools/personal-water-footprint-calculator/personal-calculator-extended/>

Once you've worked out your weekly water consumption (if on a water meter use your old water bills) set your household a realistic water conservation target. Do some research and brainstorm practical measures to reduce your water consumption. Here are a few obvious starters:

- Check for water leaks
- Retro-fit water appliances (toilets, low-flow shower heads)
- When replacing appliances choose ones that are both energy and water-efficient
- Take shorter showers
- Only use washing machines and dishwashers when they are full

- Turn off taps when shaving, brushing teeth, peeling vegetables
- In the garden use drip irrigation rather than a hose
- Plant drought-resistant lawns, shrubs and plants
- Store rainwater for garden use
- Consider whether you could collect greywater for garden use

Next week share your ideas with each other and then put them into action!



Activity: Pray

Use the poem below as a closing prayer.

Grounded in the Water

*All of life's problems bleed away
When I get grounded in the water.
Grounded in the love of God
the neverending wellspring of life
poured out for all who would drink
draw in the energy, the love, the grace
of God's gifts, freely given
like the woman at the well
we ask for the cup to be filled
for our thirst to be quenched,
without having to walk to the well
thirsty and tired, hot and tired
wanting, needing that water
grounding our faith
strengthening our spirits
to do his work*

Raymond A. Foss (2006)



Study 4 – Waters of Hope

Thus far we have reflected upon:

- water as a gift essential for life;
- some of the current threats to water in Aotearoa New Zealand and globally;
- the politics of water.

Despite the challenges that freshwater faces, it's not all bad news. Around the world human communities are waking up to the fact that clean water is essential for genuine rich living. In this study we'll reflect further upon the Christian vision of water and explore how hope put into practical action is bringing transformation to waterways and communities.



Activity: Read Scripture

Read Ezekiel 47:1–12 (Revelation 22:1-2)

As we've already noted, water features prominently in the Biblical narrative. The creation accounts in Genesis 1-2 (see Study 1) offer a captivating image of a well-watered Temple-Garden in which God is present and where all life – trees, animals and humanity – flourishes. This Temple-Garden motif is one the people of ancient Israel returned to as a source of inspiration during difficult times in their history. In exile in Babylon, the prophet Ezekiel offers a vision of life-giving water flowing perpetually from the Temple and making its way through the Jordan valley and wetlands, eventually flowing into the Dead Sea. This river brings life to all the animals and fish and the human inhabitants along its course.



Adam as Gardening Priest

Gen 2:15 says God placed Adam in the Garden ‘to cultivate it and to keep it.’ The two Hebrew words for ‘cultivate and keep’ (respectively, *abad* and *shamar*) can easily be, and usually are, translated ‘serve and guard.’ When these two words occur together later in the Old Testament, without exception they have this meaning and refer either to Israelites ‘serving and guarding/obeying’ God’s word (about 10 times) or, more often to priests who ‘serve’ God in the temple and ‘guard’ the temple from unclean things entering it (Num 3:7–8; 8:25–26; 18:5–6; 1 Chr 23:32; Ezek 44:14).

Gregory K. Beale, *‘Eden, The Temple, and The Church’s Mission in the New Creation’* (2005).

Care for Waterways

The quality of life within human societies is inextricably connected with the health of waterways. To live truly rich lives we need clean water. Around the world and here in Aotearoa New Zealand A Rocha is involved in a number of projects related to clean water and the restoration of waterways. (See: <http://www.arocha.org.nz/practical-action/>)

One of the first projects that A Rocha Aotearoa New Zealand became involved in a decade ago was the Oakley Creek/Te Auaunga restoration project in West Auckland. In the early 2000s it became clear that a proposed extension to State Highway 20 – New Zealand’s biggest and most complex roading project ever – would cut through the suburb of Waterview and Oakley Creek. Deep-rooted opposition by local residents to the idea of a motorway slicing through their neighbourhood forced planners to consider other options. The preferred one involved building the new motorway through the Oakley Creek-bed using a method called ‘cut-and-cover’. This proposal



would have meant the death of Oakley Creek and was also unacceptable to the local community. Eventually, after many years of community action and consultation, it was decided that New Zealand’s longest road tunnels would be constructed – thus saving both the Waterview community and the iconic Oakley Creek.



Watch

Oakley Creek (17.37mins)
<https://vimeo.com/185406179>



Reflect & Discuss

- What emotions were evoked by this video?
- What aspect of the video did you find most interesting and/or challenging?

Jesus & Life-Giving Water

On the last and most important day of the festival, Jesus stood up and shouted, ‘If you are thirsty, come to me and drink! Have faith in me, and you will have life-giving water flowing from deep inside you, just as the Scriptures say.’ Jesus was talking about the Holy Spirit, who would be given to everyone that had faith in him. The Spirit had not yet been given to anyone, since Jesus had not yet been given his full glory.

John 7:37-39 (CEV)

The Temple-Garden imagery which shapes the life and practices of ancient Israel continues into the New Testament. However, in the Gospels, there is a remarkable transformation, with Jesus announcing that he is both the Temple – the source of the true life-giving water (John 2:19-21) – and the life-giving water itself (John 4:13-14).

Jesus’ declaration in John 7 takes place during the Festival of Booths. For seven days, as a reminder of God’s provision of water to Israel in the wilderness (Numbers 20:2-13) and as a symbol of their hope in the coming of

a Messiah (Isaiah 12:3), water was carried in golden pitchers from the pool of Siloam to the temple in the centre of Jerusalem. Water was thus an iconic representation of the past and of the future. While water already played an important role in this festival, Jesus increases its significance by making an astonishing claim: in effect, ‘I am the water of life: true living water finds its origin and being in me.’

Jesus is not merely using water as a metaphor. In the Biblical worldview the spiritual and physical worlds are interconnected. God, the creator of all that exists, in the person of Jesus, enters the world of matter. The life-giving force of the Spirit – hovering over the waters at creation – is still present, sustaining the world (see Psalm 104). If we are indwelt by the Spirit of Jesus then this life-giving water should flow out of us in a love for the material world that God has brought into existence and sustains.



Reflect & Discuss

- The biblical writer John conceives of water as having its source/beginning, its essence and its fullness and ending in Jesus. What do you think this means?
- Faith in Jesus – the fountain/spring of true life-giving water – should result in life-giving water flowing out from us. What might we expect this life-giving water to mean for how we think and act with regard to water?

Then the one sitting on the throne said: I am making everything new. Write down what I have said. My words are true and can be trusted. Everything is finished! I am Alpha and Omega, the beginning and the end. I will freely give water from the life-giving fountain to everyone who is thirsty. All who win the victory will be given these blessings. I will be their God, and they will be my people.

Revelation 21:5-7 (CEV)



Empowered and sustained by the life-giving water of God’s Spirit, care for water will often consist of three dimensions:

- **Consciousness raising** that seeks to **reveal and resist** the activities that desecrate the life-giving gift of water.
- Seeking to **conserve** and **restore** the health and quality of waterways.
- **Creative, responsive** ways of living that **replicate the rhythms** of nature.

This three-tier model is the same we see in the life of Jesus. We see Jesus: revealing and speaking out against the life-destroying religious, economic and political systems of his day; restoring the victims of this system; creating a new community committed to just and peaceful living, empowered by love.



Reflect & Discuss

- Which of these dimensions do you most naturally gravitate towards?
- Which do you find most unsettling? Why is this?

Sacrifice and Suffering

Globally, as pressure over water increases (often due to corporate interests) there are growing numbers of communities engaged in this first dimension. However, consciousness raising through nonviolent resistance often involves significant personal cost and sacrifice.

In the 1990s, Ken Saro-Wiwa, a Nigerian writer, led a nonviolent campaign to protest against the degradation of the land and waters of his homeland of Ogoniland, due to the operations of multinational oil companies – in particular, Shell. Ultimately, Saro-Wiwa’s campaign against the collusion of the Nigerian government of the

‘I have no doubt at all about the ultimate success of my cause, no matter the trials and tribulations which I and those who believe with me may encounter on our journey. Neither imprisonment nor death can stop our ultimate victory.’

Ken Saro-Wiwa, ‘Final Statement before Execution’ (Nov 1995)

time – a military dictatorship – and multinational oil companies led to his arrest, a rigged trial, and despite international condemnation, his execution.

That in defending the health of water and the life it sustains we may face significant difficulties should not surprise us. As the writer of 1 John notes: 'Jesus Christ came by the water of baptism and by the blood of his death! He was not only baptised, but he bled and died.' (1 John 5:6). As followers of Jesus the waters of baptism summon us to the way of costly discipleship and thus to suffering.



Reflect & Discuss

- Do you know individuals and communities who have suffered for speaking out against the abuse of land, water and communities?
- What are your thoughts and emotions towards the strategy of direct action or peaceful protest around water and other environmental issues? Does this approach have a place in Christian discipleship? Why or why not?
- Would you be prepared to suffer to protect the quality of water for your own family or community?

Clean Water, Climate Change and Community Development

Care for water will not always involve confrontation. As noted earlier, there are A Rocha projects around Aotearoa New Zealand involved in the second dimension of *conserving* and *restoring* waterways.

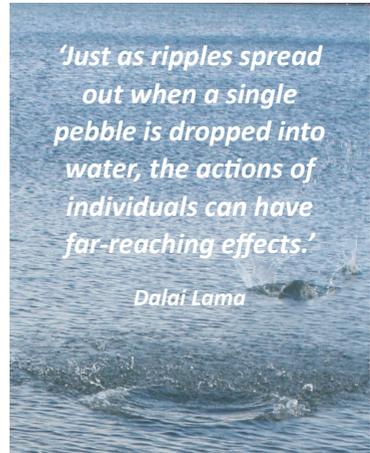
Meanwhile, an A Rocha Uganda project offers a striking illustration of how *creative responses* can enhance the health & wellbeing of human communities and broader creation. As in many developing world contexts, the water available to slum communities near Kampala is unsafe to drink. A Rocha Uganda provides cheap and easy to use bio-sand water filters to produce clean and safe drinking water for these communities. In doing so they provide richer living for the human community, the land, and countless other species!





Activity: Life-Giving Water for Others

Mother Teresa is often attributed (incorrectly) with the saying: ‘I alone cannot change the world, but I can cast a stone across the waters to create many ripples.’ Regardless of the quote’s origins, there is truth in this and the similar quote from the Dalai Lama. Critical too is the knowledge that we do not follow Jesus as individuals but as part of a new community – the body of Christ.



Think about the ways as a community you could contribute to the water issues faced by a community in a developing country. A Rocha International has a range of projects – including bio-sand water filters – that bring wellbeing to human communities while also protecting waterways and broader ecosystems. See: <http://shop.arocha.org/>



Activity: Bringing it Home

- On a large sheet of paper brainstorm ways in which your family, church or community could be involved in the three dimensions of caring for water we saw above.
- Have you thought of your home, church building or neighbourhood as a Temple-Garden? How might this idea shape your living?
- What practical measures could you introduce to transform your home, church building or neighbourhood into a Temple-Garden?
 - Rain-harvesting from the roof?
 - Planting a community garden, orchard or food-forest?
 - Creating a contemplative garden for prayer and reflection (with recycled running water)?
 - Digging up hard surfaces and restoring habitat for biodiversity (fruiting and nectar trees for birds or stone gardens for gecko and lizards)?



Activity: Reflect & Pray

Spend time together in silent reflection.

What pebbles is God asking you to hurl, drop or coax into the water?

Use a marker pen to write down on pebbles the actions that God is calling you to take individually or collectively, in light of what you've learned during these studies.

Symbolically, drop these pebbles into a bucket of water – or into a nearby stream or lake.

Ripples on the Water

*A rock thrown in the pond,
full force, or maybe, just maybe,
thousands of pebbles, hurled,
dropped,
even gently coaxed into the water
ripples, reverberating, echoing,
growing into a groundswell
a tsunami, if even have force
to change the face of the planet
to change the discussion
at least for a day
onto on topic
where we live
the place
we call
home*

Raymond A. Foss (2007)



Activity: Into the Future

There are four other booklets in the Rich Living series that reflect on the themes of Climate Change, Food, Transportation, Stuff & Waste. If you've enjoyed engaging with the studies in this booklet, order the others and continue the journey together.



The existing Western lifestyle is unsustainable – our consumption habits impact on the wellbeing of our human and non-human neighbours. But Christian faith communities have the potential to be agents of hope.

This booklet is one of five in the Rich Living series (*Climate Change, Water, Food, Transportation, Stuff & Waste*). Designed for small groups, each booklet consists of four studies designed to assist communities make sustainability integral to their lives of faith.