HEALTHIER, LONGER, BETTER LIVES

THE ENVIRONMENT AND OUR HEALTH

A summary of the evidence and scientific literature linking human health and the environment

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Contents

A message from AIA

At AIA our dream is for New Zealand to be one of the healthiest and best protected nations in the world. Through our flagship AIA Vitality programme, we see first-hand the difference preventative health measures can have on long-term health and wellbeing.

There is mounting evidence that demonstrates the inextricable relationship between our health and the environment. Our behaviours and activities have an impact on the environment, which in turn significantly impacts the health and wellbeing of individuals, whānau and communities. We cannot thrive in an unhealthy environment, while the environment cannot thrive when our behaviours are unhealthy - a concept well understood by Māori, our tangata whenua (the first people of this land), with 'waiora'.

At AIA New Zealand we are taking steps to ensure we do our part to protect our country's unique 'taiao' or natural environment. We have committed to achieving net-zero greenhouse gas (GHG) emissions by 2050, and have partnered with Trees That Count, a New Zealand conservation charity, to support the planting of millions of native trees around Aotearoa.

Together we can be part of the solution, and support all New Zealanders to live Healthier, Longer, Better Lives in kotahitanga or unity with the environment.

Nick Stanhope

Chief Executive Officer
AIA New Zealand

Summary

There is an inextricable link between our health and the environment, which is becoming increasingly evident.

The nature of the relationship is two-way; that is, our behaviours impact environmental health, which in turn impacts human health. For humans to thrive, a healthy environment is essential, and in the same way, the environment needs healthy human behaviour to thrive.

Globally, almost a quarter of all annual deaths (12 million) are linked to the environment, and nearly two-thirds of these deaths are due to non-communicable diseases (NCDs).

NCDs can be affected by risk factors that originate in the environment, or by risk factors that are influenced by the environment. Concerningly, the overall impact of the environment on human health is escalating.

AIA New Zealand has incorporated these insights into its strategy to curb the rising rates of NCDs through health promotion and prevention. AIA New Zealand published its 5590+ Insight Report in 2021, which highlights the five main modifiable behavioural risk factors: physical inactivity, poor nutrition, smoking, excess alcohol intake and our interaction with the environment – that lead to the five main NCDs: cancer, diabetes, respiratory disease, heart disease and poor mental health. Together they are responsible for more than 90% of deaths in New Zealand.

Waiora

The importance of our interactions with the environment and its impact on physical, mental and spiritual health is a well-known concept in Māori culture. Under the Te Pae Māhutonga health framework, 'waiora' encapsulates the importance of the environments in which we live, and the significant impact they have on the health and wellbeing of individuals, whānau and communities. The concept reflects the need for Māori to have access to resources and to live in environments that support and sustain a healthy life.

> *Good health is difficult to achieve if there is environmental pollution; or contaminated water supplies, or smog which blocks out the sun's rays, or a night sky distorted by neon lighting, or earth which is hidden by concrete slabs, or the jangle of steel which obliterates the sound of birds. Something is lost when the spiritual connection between people and the environment is felt second hand through a television screen or via a computer simulation.*
>
> *Health promotion must take into account the nature and quality of the interaction between people and the surrounding environment. It is not simply a call for a return to nature, but an attempt to strike balance between development and environmental protection and recognition of the fact that the human condition is intimately connected to the wider domains of Rangi and Papa.*
>
> • Sir Mason Durie, ONZ KNZM,
> Te Pae Māhutonga: A Model for Māori Health Promotion

Climate change

Climate change is the greatest global health threat of this century. It plays a crucial role in human health and wellbeing, in two ways:

- Directly: through storms, droughts, floods, heatwaves, temperature changes and wildfires.
- Indirectly: through water quality, air quality, land-use change and ecological change.

The risk of NCDs increases as a direct result of climate change, such as an increased risk of cardiovascular disease due to air pollution and extreme temperatures. In addition, NCDs are indirectly impacted by climate change, for example through changes to food availability.

The consequences of climate change can cause significant mental distress, as well as exacerbate pre-existing mental health conditions. Direct consequences may include trauma related to extreme weather events, while climate change-related disruptions like famine and displacement may indirectly have mental health consequences. Overall, the awareness of climate change and its current and future impacts can result in long-term distress.

Air pollution

Air pollution is second only to smoking in causing NCDs worldwide, contributing to cancers, stroke, heart disease and chronic obstructive respiratory disease.

Pollution can result from pollutants that are natural, such as from volcanic eruptions, or that are anthropogenic (man-made), such as from second-hand tobacco smoke and emissions from motorised transport.

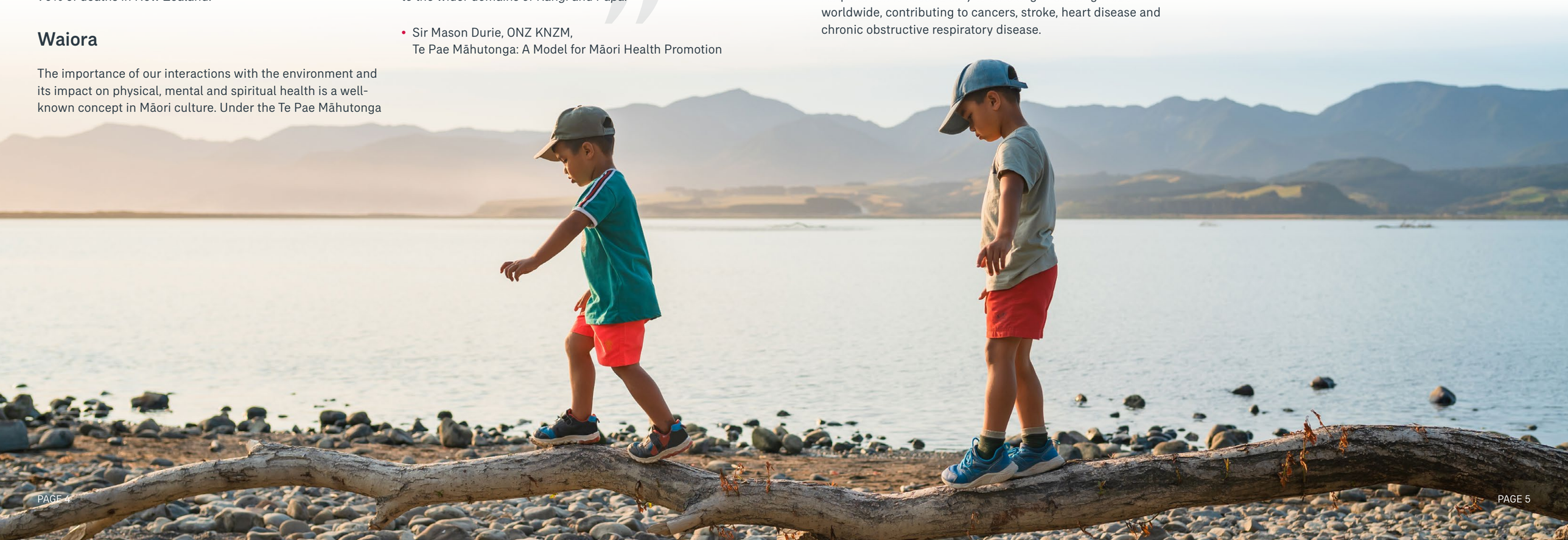
Agriculture and food production

Agriculture, in particular food production, is a known driver of global environmental change. It contributes to climate change, biodiversity loss, freshwater use, and land-system change.

The most common environmental issues in the food system relate to food processing loss, food wastage and packaging, energy efficiency, transportation of food, water consumption and waste management. While there is more to be done, New Zealand farming is generally considered more sustainable than many other nations globally.

Dietary patterns have shifted towards diets that are high in unhealthy, processed foods. This has resulted in an increase in diet-related diseases, such as a significant increase in the global prevalence of diabetes. At the same time, this trend has caused environmental degradation, due to factors such as an increase in the global use of nitrogen fertiliser.

In contrast, foods that are associated with improving health, such as whole grains, fruit, vegetables, nuts and legumes, often have a low impact on the environment.



Urbanisation and the built environment

Urbanisation and the built environment can significantly influence physical and mental health – both positively and negatively. Well-planned cities and built environments have the potential to promote health and wellbeing and therefore reduce the incidence of NCDs.

For example, a city can be intentionally designed to encourage positive healthy behaviours like increased physical activity, via walking and cycling paths, green spaces (e.g. parks and reserves), recreational facilities and sports infrastructure. In contrast, cities have historically been designed in ways that discourage physical activity and encourage sedentary behaviour, such as through transport systems dominated by motorised vehicles and limited facilities and spaces that allow for physical activity.

Green spaces are increasingly associated with improved human health (physical and mental), and reduced mortality. At the same time, green spaces result in environmental health benefits.

Blue space, which refers to visible, outdoor, natural surface waters, also has the potential to promote human health and wellbeing. Research shows that investment in blue spaces can improve mental health.

Opportunities for change

Policies and programmes that consider both the environment and the causes of NCDs – for example, those focused on reducing air pollution and designing healthy urban spaces – are an important upstream preventative approach that has mutual benefits for communities and the planet.

At an individual level, everyone can take small steps to shift their behaviour towards reducing their risks of NCDs, while incidentally improving the health of the environment.

For example, choosing to follow a planet-friendly diet can increase nutrient intake while reducing the impact on food production and processing. Choosing public transport can reduce air pollution by reducing vehicle emissions and provides opportunities for active transport between rides.

AIA New Zealand's purpose is to help New Zealander's live Healthier, Longer, Better Lives. We realise that it is critical that we encourage a healthy interaction with the environment to improve planetary health, and to help Kiwis live Healthier, Longer, Better Lives. To achieve this, our wellbeing strategy focuses on healthy behaviours highlighted in the 5590+ framework: being more active, eating well, not smoking, avoiding excessive alcohol intake, and improving our individual interaction with the environment.

The AIA Vitality health and wellbeing programme provides a platform that integrates scientific evidence with behavioural economics to shift behaviours by rewarding healthier choices. As members improve their behaviours, they reduce their risk of NCDs and their impact on the environment.

As part of the AIA Group's overarching Environmental, Social and Governance (ESG) strategy, AIA has committed to achieving net-zero greenhouse gas (GHG) emissions by 2050. AIA has also committed to the Science Based Targets initiative (SBTi), a global body enabling businesses to set ambitious emissions reduction targets in line with the latest climate science.

Based on the estimation that planting one trillion trees globally could arrest the effects of climate change, combined with emerging evidence of the positive health impacts of nature, we have also partnered with Trees That Count as an impactful and cost-effective intervention. Trees That Count are an NZ conservation charity bringing together business, community and everyday New Zealanders, with the vision of helping plant millions of native trees across Aotearoa.

Introduction

There is an inextricable link between population health and the environment[1]; significant evidence of the interplay between environments and human health and wellbeing exists. Human behaviours have an impact on the environment and the environment in turn impacts people in many ways, resulting in a clear bi-directional relationship. Without a healthy environment, people cannot thrive[5].

Broadly, the environment includes everything external to people, including the physical, natural, social and behavioural environments. Environmental health is a branch of public health that focuses on preventing or controlling disease, injury, and disability related to the interactions between people and their environment[2].

Globally, 23% of all deaths (about 12.6 million deaths per year) are linked to the environment[7] and nearly two-thirds of these are due to non-communicable diseases (NCDs)[7]. Many NCD risk factors are environmental in origin or may be influenced by the environment[1,28] and evidence of the impact of the environment on NCDs is increasing[25, 27, 28, 29].

For the purposes of this paper, "human health" will incorporate physical and mental health, while "environmental health" will incorporate the natural and the built environment.

NCDs – from 4490 to 5590+

Until recently, it was accepted that four modifiable behaviours – physical inactivity, poor nutrition, smoking and excess alcohol – led to four major NCDs – cancer, diabetes, respiratory and heart diseases. Each year these NCDs are responsible for 90% of deaths in New Zealand.

AIA New Zealand referred to this health insight as 4490 – that is, four modifiable behavioural risk factors leading to four NCDs that caused 90% of New Zealand deaths. 4490 provided the foundation for AIA New Zealand's purpose-driven focus on life, health and wellbeing.

In keeping with the latest evidence and data on global disease, in 2021 AIA New Zealand updated 4490 to 5590+. This revision includes a fifth NCD: poor mental health, and a fifth modifiable behavioural risk factor: our interaction with the environment. Combined with the 4490 inputs, these now lead to more than 90% of deaths in New Zealand.

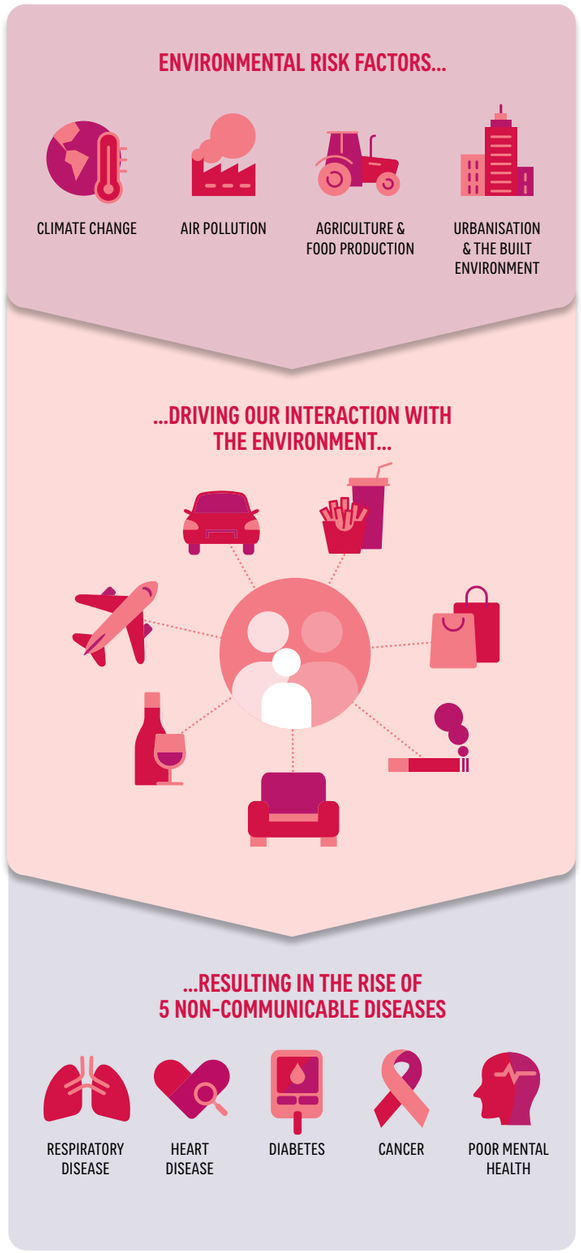
The case for investing in health promotion and prevention of NCDs is now stronger than ever. NCDs are the main cause of death and disability worldwide, and yet they are largely preventable.

AIA New Zealand is contributing to the critically important work of improving New Zealand's health outcomes and helping Kiwis live Healthier, Longer, Better Lives, through the prevention of these conditions – and a focus on the modifiable behavioural risks that underpin these.

This paper focuses on the link between health and the following environmental factors that impact NCDs:

- Climate change, which was recognised as the biggest global health threat of the 21st century by The Lancet in 2009[17]
- Air pollution, which is the second leading cause of global NCDs, second only to smoking tobacco
- Agriculture and food production, which is a major cause of global environmental change[86]
- Urbanisation and the built environment, with urban planning now recognised as part of a comprehensive solution to tackling adverse health outcomes[101].

FIGURE 1: KEY ENVIRONMENTAL AND HUMAN HEALTH INTERACTIONS



Climate change

The earth's changing climate is evidenced by increased temperatures (atmosphere and oceans), rising sea levels and shifting weather and wind patterns[18]. Human activities, such as the extraction and burning of fossil fuels, deforestation, and industrial and agricultural activities, produce greenhouse gases (GHGs), such as carbon dioxide, black carbon, and methane. These gases concentrate in the atmosphere and stop heat from escaping[19] with the resulting warming effect impacting people, plants, wildlife and ecosystems[20].

Health impacts

Climate plays an important role in human health and wellbeing, especially where climates are extreme and variable[16]. NCDs are exacerbated by climate change[25].

Climate change impacts human health directly (e.g. storms, droughts, floods, heatwaves, temperature changes and wildfires) and indirectly (e.g. water quality, air quality, land use change and ecological change)[8].

Groups who are often most affected by the mental and physical health implications of climate change include indigenous peoples, including Māori and Pacific people, children, seniors, women, people with low socioeconomic status, outdoor labourers, and people with pre-existing health conditions[17, 40, 49, 50, 53, 60, 61, 62, 63].

Climate change is however strongly mediated by environmental, public and social health determinants.

Mental health

Direct, indirect and overarching consequences of climate change can create significant mental stress and exacerbate pre-existing mental health problems. Direct psychosocial consequences of climate change include trauma related to extreme weather events, like floods, hurricanes, wildfires, and heat waves[42, 74]. Research on climate change and mental health provides increasing evidence that extreme weather events can trigger post-traumatic stress disorder (PTSD), major depressive disorder (MDD), anxiety, depression and a variety of other mental health concerns[40–53].

Indirect mental health consequences of climate change occur through social, economic, and environmental disruptions (e.g. famine, civil conflict, displacement, and migration) related to climate change[15, 37].

Overarching psychosocial consequences of climate change relate to the long-term emotional distress caused by awareness of the threats and impacts of climate change on the current and future wellbeing of the earth and its people. The multi-dimensional climate change and mental health pathway leads to a variety of unequal psychosocial consequences[73]. The threat of a changing climate can also incite despair and hopelessness, as actions to address climate change seem intangible or insignificant in comparison to the scale and magnitude of the threats[57].

Respiratory health

As temperatures rise and air pollution increases, there are also increases in the incidences of allergic respiratory disease, asthma, and other health conditions[21]. Ozone pollution, which increases with rising temperatures, is linked to asthma, bronchitis, and emphysema[23].

Cardiorespiratory disease and death

Forest fires produce air pollutants, such as carcinogens and fine particulate matter which is linked to cardiorespiratory disease and death[22].

Cancers

Exposure to ultraviolet radiation is recognised as a risk factor in the three most common types of skin cancer: basal cell carcinoma (BCC), squamous cell carcinoma (SCC) and malignant melanoma (MM). Approximately 90% of skin cancers are non-melanocytic BCCs[199]. In New Zealand, with our high levels of ultraviolet radiation (UV), skin cancer is prevalent. An estimated 90,000 non-melanoma skin cancers are diagnosed each year in New Zealand, with an approximate health care cost of $129.4 million. About 2,800 invasive melanomas are diagnosed, with estimated health care costs of $54.5 million[201]. By 2025 the total cost of skin cancer treatment is expected to grow to $295 million.

According to the Ministry of Health, in 2019 there were 503 deaths from skin cancer in New Zealand, and of these, 328 deaths were from melanoma and 175 deaths from other types of skin cancers[202].

Air pollution

Air pollution was featured on the global agenda almost twenty years ago in the WHO's Global Action Plan for the Prevention and Control of NCDs 2013-2020[26].

Sources of air pollution can be natural or man-made (anthropogenic). Natural sources include bushfires, volcanic eruptions and dust storms, while anthropogenic sources of air pollution include emissions from power stations, factories, motor vehicles and hazard reduction burns[8]. Anthropogenic sources are more of a concern for air quality as they tend to be more controllable than natural sources.

Air pollution and climate change have a bi-directional relationship through complex interactions in the atmosphere. For example, increased GHG emissions increase air pollution, which can lead to increased temperatures, which causes changes to the chemical composition of the atmosphere. Therefore, policies to address climate change and air pollution can be mutually beneficial. Combining local air pollution and global climate change mitigation policies provides a win-win situation whereby medium-term efforts to control air pollution will support long-term strategies that aim to curb climate change[200].

Health impacts

Several meta-analyses and reviews show a relationship between air pollution exposure and health impacts, including NCDs and their risk factors[102]:

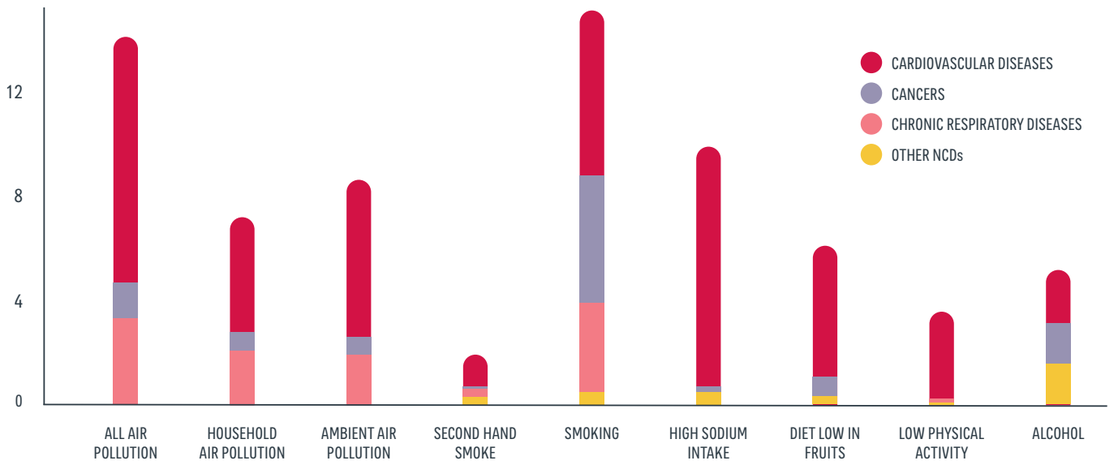
- incidence and prevalence of childhood asthma and wheeze
- asthma exacerbation
- impaired lung function[137]
- cardiovascular mortality and morbidity
- all-cause mortality
- hospital admissions
- restricted physical activity.

The carcinogenic effects of air pollution have been increasingly recognised.

The Global Health Observatory has stated that in 2016, ambient and household air pollution together caused 24% of cases of stroke, 25% of ischaemic heart disease, 29% of lung cancer, and 43% of chronic obstructive respiratory disease.

Globally, almost one-third of cardiovascular disease burden is attributable to household air pollution (17%), ambient air pollution (13%), second-hand tobacco smoke (3%) and exposure to lead (2%)[7]. Chronic obstructive respiratory disease deaths are attributable to household air pollution (29%), ambient air pollution (8%) and workplaces (11%)[7]. Research also indicates that air pollution reduces the quality of life for people with chronic respiratory disease[8].

FIGURE 2: ATTRIBUTABLE FRACTION OF NCDS FOR SELECTED RISK FACTORS BY DISEASE GROUP, 2016[25, 32, 33]



Mouldy homes

In New Zealand, household air pollution is heightened by the nation-wide issue of 'mouldy homes'. Mould, dampness and condensation worsens the respiratory health (e.g. breathing) of those living in affected houses. This can lead to a range of ongoing poor health issues, including asthma (particularly in young children), rheumatic fever (which can require hospitalisation) and cardiovascular conditions.

Hospitalisation for bronchiectasis, childhood bronchiolitis and total respiratory disease is on the rise, and currently respiratory disease accounts for one in ten of all hospital stays in NZ, with one third of whom are children.[203] The 2018 Census recorded more than 280,000 children in Aotearoa who lived in damp housing, and 237,000 in housing with mould[204].

To combat this the NZ Government introduced healthy homes standards in July 2019, which set specific and minimum standards for heating, insulation, ventilation, moisture, drainage and draught-stopping in rental properties.

Nearly 600,000 households rent in NZ. All private rentals must comply with the healthy homes standards within 90 days of any new or renewed tenancy, with all private rentals complying by 1 July 2024. In Figure 2, all air pollution (combined) is shown as a major risk factor for NCDs, second only to smoking.

The 2018 Census recorded more than 280,000 children in Aotearoa who lived in damp housing, and 237,000 in housing with mould.

Agriculture and food production

Strong evidence indicates that agriculture is a major driver of global environmental change, while food production specifically is the largest. Research demonstrates that food production contributes to climate change, biodiversity loss, freshwater use, interference with the global nitrogen and phosphorus cycles, chemical pollution and land-system change[76].

Globally, agricultural food production emits approximately 30% of GHGs[115, 116]; occupies approximately 40% of land[117]; causes nutrient pollution that profoundly alters ecosystems and water quality[118]; and accounts for approximately 70% of Earth's freshwater withdrawals from rivers, reservoirs, and ground water[119]; among other negative environmental effects[120, 121].

Food systems that are unsustainable threaten to outstrip the planet's natural resources, while dietary patterns are unhealthy, unaffordable and unsustainable.

It is worth noting that research into the full life-cycle carbon footprint of New Zealand's beef & sheep meat has found that it sits at the lower end of published estimates among producers globally, despite distance from markets. Similarly, research shows New Zealand is also the most efficient of the major global milk producing countries, with an on-farm carbon footprint 48 percent less than the average of 18 countries studied[207].

Eating patterns impact the environment, but the environment can also impact dietary choice (e.g. loss of food biodiversity impacts the availability of micronutrients)[99].

Swinburn et al[139] defined the food environment as the "collective physical, economic, policy and socio-cultural surroundings, opportunities and conditions that influence people's food and beverage choices and nutritional status".

Food environments can be framed as the 'interface' or 'link' between food systems and diets[140] and comprise the foods available to people in their surroundings as they go about their everyday lives, and the nutritional quality, safety, price, convenience, labelling and promotion of these foods[140, 141].

Diets link environmental and human health. Rising incomes and urbanisation are driving a global dietary transition in which traditional diets are replaced by diets higher in refined sugars, refined fats, oils and meats[111]. Equally, due to recent economic activity New Zealand is experiencing a rise in inflation and costs of living, including food and petrol prices. This is likely to result in those on lower incomes unable to afford more expensive, healthier food options, and instead purchase cheaper, processed foods that have lower nutritional value. These dietary shifts are driving increases in diet-related diseases and are also causing environmental degradation[189].

Health impacts

Obesity and diet-related NCDs are mainly driven by unhealthy diets[143, 144]. Unhealthy diets, in turn, are driven by unhealthy food environments[145].

If these dietary trends continue, by 2050 they will be a major contributor to an estimated 80% increase in global agricultural GHG emissions from food production, and a cause of global land clearing[111]. Moreover, these dietary shifts are greatly increasing the incidence of type II diabetes, coronary heart disease and other chronic NCDs that lower global life expectancies[111].

Recent dietary shifts have contributed to an increase in diet-related health and environmental impacts, including an 80% increase in global diabetes prevalence and an 860% increase in global nitrogen fertiliser use[189].

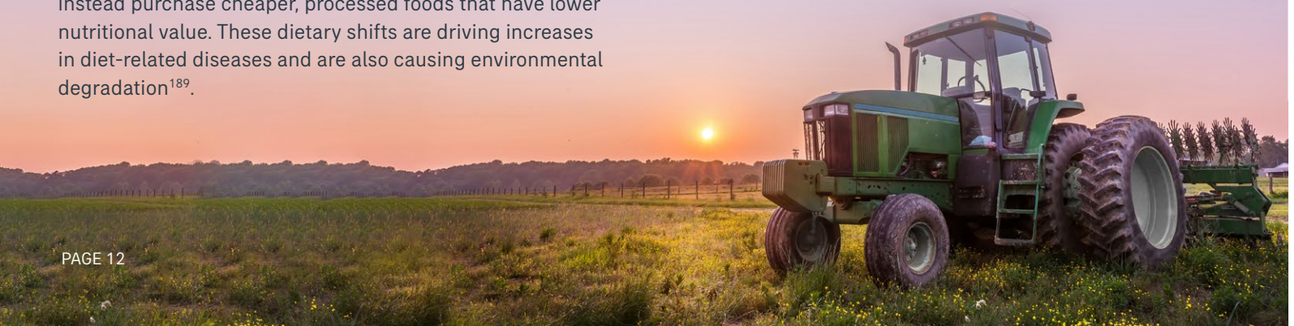
This diet–environment–health trilemma is both a global challenge and an opportunity. Developing solutions to this trilemma is therefore of great environmental and public health importance[111, 189].

The most common environmental issues in the food industry are related to food processing loss, food wastage and packaging; energy efficiency; transportation of foods; water consumption and waste management[99].

Research has found that foods associated with improved adult health also often have low environmental impacts, indicating that the same dietary transitions that would lower incidences of NCDs would also help meet environmental sustainability targets[112].

Of the foods associated with improved health (such as whole grain cereals, fruits, and vegetables), most also have a lower environmental impact.

Foods associated with the largest negative environmental impacts – such as foods high in refined sugars or saturated fats – are also associated with the largest increases in disease risk[112].



The relative risks of food, diseases and the environment can be seen in Figure 3 below. Graph A shows the relative risks of disease per serving of food, while B shows the relative environmental impact per serving of food produced.

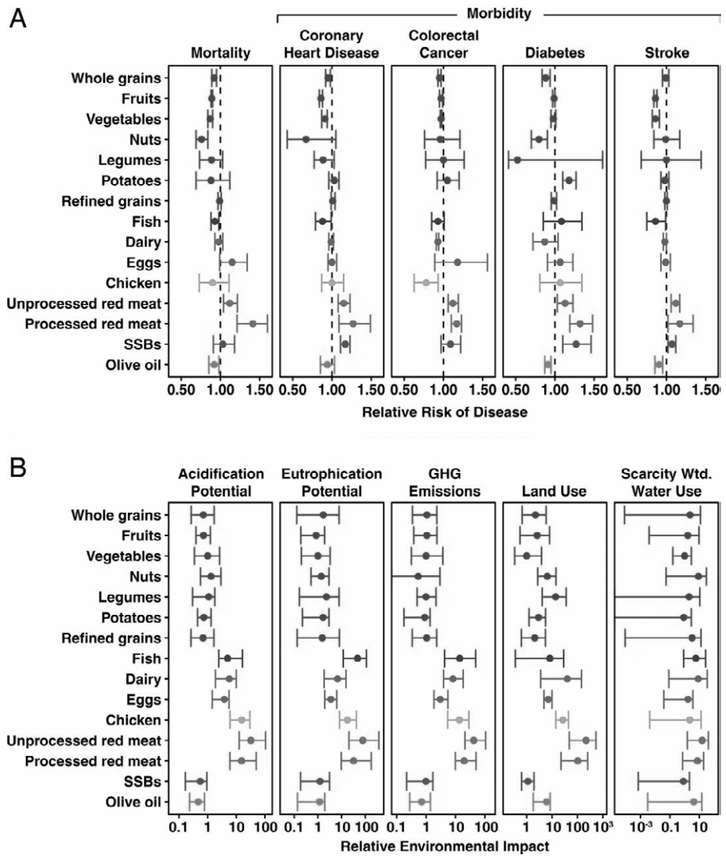
Win-win diets are diets that are healthy and environmentally sustainable[86]. Lose-lose diets are unhealthy and environmentally unsustainable diets[86].

EAT-Lancet Commission

The EAT-Lancet Commission was convened to develop global scientific targets for healthy diets and sustainable food production[75]. The Commission developed a "universal healthy reference diet" to provide a basis for estimating the health and environmental effects of adopting an alternative diet, as compared with current standard diets, many of which are high in unhealthy foods[76].

The healthy reference diet largely consists of vegetables, fruits, whole grains, legumes, nuts, and unsaturated oils. It includes a low to moderate amount of seafood and poultry, and little-to-no red meat, processed meat, added sugar, refined grains, and starchy vegetables.

The global average intake of healthy foods is substantially lower than the healthy reference diet, and over-consumption of unhealthy foods is increasing[76]. The Commission found with a high level of certainty that global adoption of the reference diet would provide major overall health benefits, including a large reduction in total mortality[76]. It is considered that dietary changes from current diets to healthy diets are likely to substantially benefit human health, preventing around 10.8-11.6 million deaths per year – a reduction of 19.0–23.6%[76].



Source: pnas.org

A Health data are reported as the relative risk (RR) of disease per serving of food consumed, where an RR <1 indicates that food consumption is associated with decreased disease risk and an RR >1 indicates that food consumption is associated with increased disease risk. Range bars indicate the 5th and 95th percentile confidence intervals.

B Environmental data are shown as the relative environmental impact per serving of food produced, where a value of 1 indicates that producing a serving of food has the same environmental impact as producing a serving of vegetables. Values below 1 indicate a lower environmental impact and values above 1 indicate a more intensive environmental impact.

Urbanisation and the built environment

Urbanisation is the process of the population shifting from rural to urban areas within countries[181]. Urbanisation is seen by many as a double-edged sword: while its beneficial economic effects are widely acknowledged, it is commonly seen as creating adverse side effects for NCD-related health outcomes[181].

It is estimated that the world's population will reach 10 billion people by 2050, and 75% of this population will live in cities[101]. Urban spaces are increasingly being recognised as important social determinants for health with the potential for both negative and positive effects on physical and mental health[129].

The built environment is defined as the part of the physical environment that is constructed or modified by human activity[146]. It includes homes, schools, workplaces, parks or recreation areas, green-ways, business areas and transportation systems.

Leading global agencies recognise that city planning and management decisions affect the liveability of cities[103] and, ultimately, the health and wellbeing of residents.

Health impacts

Mental health

Positive mental health is related to mental and psychological wellbeing, and there is growing interest in the potential role that the built environment has on mental health[157]. While research into the role of the built environment on mental health is relatively new, causal pathways connecting both constructs are starting to emerge[157].

Studies of the relationship between built environments and mental health have reported that the quality of public utilities, walking distance to public spaces, access to transport, and level of infrastructure[158, 159 -164] contribute to a state of wellbeing, positive responses to stress factors, ability to work productively, and community participation.

Physical activity

Physical inactivity is one of the largest contributors to the development of NCDs, and much of the evidence on city planning and health has focused on this[102]. Levels of physical activity are impacted by the environment via mode of transport, design of cities, and green space access[25, 35, 36, 37].

The environment is integral to encouraging and enabling physical activity[148]. Town planning can facilitate people meeting the recommended levels of daily physical activity due to incidental exercise completed as part of everyday life. Even though individual and social factors can affect physical activity[150], research has shown that well-designed environments can provide an important positive influence[151, 152, 153].

Physical activity can be classified into the four domains of life where people largely spend their time: recreational, occupational, transport and household activities. Recreational and transport physical activities are relevant to, and are driven by, features of the built environment. This provides further opportunity for strategic planning to positively influence health and wellbeing outcomes in this space[154].

Features of the built environment that are hypothesised to impact recreational and transport activity can be categorised as:

- Recreational resources: Walking trails, biking trails, parks and open spaces, pools, playgrounds, and sport clubs
- Land use characteristics:
  - Residential and employment density
  - Land use mix (types of buildings, services and businesses in the community)
  - Street connectivity (grid pattern, cul-de-sac and loopholes)
  - Proximity of destinations (shops, employment and services) to residences
- Neighbourhood characteristics:
  - Availability of sidewalks and streetlights
- Community environment:
  - Mostly contextual features of the environment such as aesthetics, cleanliness, traffic
  - Crime safety, community support or cohesion.

Physical inactivity, also called sedentary behaviour, refers to periods of prolonged inactivity, such as sitting for a long time in a vehicle, watching TV or doing desk work. Sedentary behaviour is distinct from physical activity, and has emerged as an independent risk factor for chronic disease prevention[169, 170]. It is associated with an increased risk of type II diabetes, cardiovascular disease, some cancers, and all-cause mortality[171, 172]. Prolonged periods of sitting can be associated with poorer mental health[186]. Urban-dwelling working adults can sit for 10 hours or more per day, which increases health risks, even among those who meet physical activity guidelines[182, 183].

Urban design and transport

Urban and transport planning and design decisions affect NCDs, injuries, and other adverse health outcomes[102]. For example, motor vehicle-oriented land-use and transport policies in cities impact the rates of NCDs and road-related injuries in a city[102, 104]. These decisions can also influence the convenience, attractiveness, and safety of walking and cycling for transport, as well as the opportunities for, and desirability of, recreational physical activity.

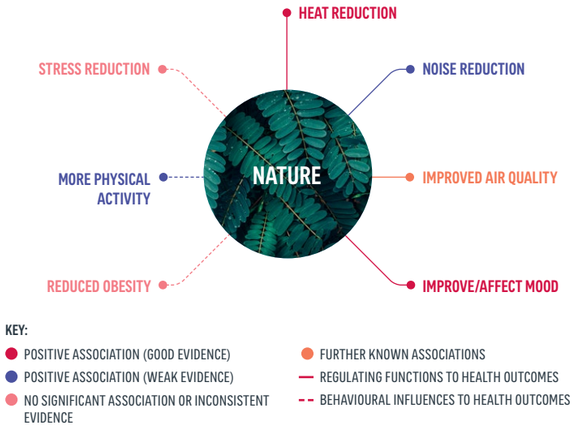
Well planned cities can reduce NCDs and road trauma, while promoting health and wellbeing more broadly[102]. Creating cities that facilitate physical activity as part of daily activities can promote health and prevent NCDs[102].

Possible health-promoting interventions in cities include reducing motorised vehicles dependency, traffic exposure, pollution, noise, and urban heat-island effects. These can help to enhance mental wellbeing, mitigate climate change, and promote walking and cycling in ways that are safe, comfortable, and desirable[102].

Natural environments

Exposure to natural environments impacts NCDs and other health outcomes through various pathways, as shown in Figure 4.

FIGURE 4: PATHWAYS FOR PHYSIOLOGICAL OUTCOMES ASSOCIATED WITH 'EXPOSURE TO NATURAL ENVIRONMENTS'[167]



Urban green spaces, as part of a wider environmental context, have the potential to help address problems 'upstream', in a preventative way. Adopting this approach is considered to be more efficient than by simply dealing with the 'downstream' consequences of ill health[187].

Green spaces have been shown to be associated with better health outcomes and reduced mortality[130]. Living near green space, particularly in urban areas, can have a positive effect on health, possibly even on blood pressure, depression, and physical activity levels[131]. Green space also benefits the environment and helps to combat climate change[132].

Defined blue space is used to refer to all visible, outdoor, natural surface waters, with potential for the promotion of human health and wellbeing[168]. In the first systematic review of the literature on blue care (a systematic review of blue space interventions for health and wellbeing), Britton et al showed that mental health, especially psychosocial wellbeing, can be improved with investment in blue spaces. Future research should however focus on developing further insight into the mechanisms through which blue care can improve public health promotion.

Opportunities for change

Evidence of the interplay between the environment, human health and wellbeing is significant and increasing. Incorporating environmental factors with the four well-known four NCD risk factors (smoking, excess alcohol, physical inactivity and unhealthy diets) provides a more comprehensive approach to tackling NCDs.

Shifting behaviours for impact

While solving environmental challenges may seem overwhelming at an individual level, every person can make small, positive behaviour changes that can influence how they and others interact with the environment. This domino effect amplifies individual actions to a collective impact on the environment and human health.

Mindfulness

We can start by being mindful about our how we interact with the world around us – our lifestyles are the sum of regular actions or habits that leave a footprint on our ecosystem. Shifting our mindsets to this increased awareness helps to highlight potential opportunities for ways to benefit our health, as well as the planet's.

Consumption

Our consumption patterns reflect what we use, how much we consume and how often. These are key when identifying ways to reduce environmental harm. There is a myriad of easy but valuable ways to reduce our consumption, including using less water, conserving electricity, avoiding chemical use, and buying second-hand items.

Composting, recycling and upcycling are on the rise in New Zealand, which is good news for reducing environmental harm from over-consumption. Statistics show that annual recycling has significant benefits for air quality. Interestingly, recycling one plastic drink bottle saves enough energy to power a computer for 25 minutes.

Purchasing power

We can harness our purchasing power to benefit the planet. Becoming conscious consumers can help us improve where and how we shop. For example, choosing to buy locally grown foods from a farmers' market reduces the carbon footprint of food miles, while reducing packaging. Shifting our preferences towards reusable products instead of single-use products reduces environmental load, and influences purchasing patterns.

Harnessing solar energy, for example by switching to solar power at home, reduces the harmful emissions that result from generating electricity. Currently New Zealand has the third highest rate of renewable energy as a portion of primary supply in the OECD (after Norway and Iceland) with 40% of our primary energy coming from renewable source, and 82% of electricity generation coming from renewable sources. While we rely heavily on renewables, such as hydro, geothermal and wind to produce our electricity, 60% of our energy still comes from fossil fuels[205].

Dietary choices

Eating patterns that minimise damage to the environment while supporting our health and wellbeing are known as 'win-win' diets. These diets tend to be plant-based, emphasising vegetables, fruit, whole grains, legumes and nuts. As with other small changes, the cumulative effect of every individual making one change to their diet has enormous potential for influencing purchasing patterns, health and impact on the planet.

Transport

Shifting the choices we make about how we travel by using active transport (cycling or walking) and public transport versus private cars can significantly reduce air pollution via vehicle emissions. In addition to improved human and planetary health is the economic benefit from reduced transport costs.

While the COVID-19 pandemic has reduced air travel significantly, we can in the future look to fly less by continuing to schedule virtual meetings, holidaying locally, and using trains instead of planes where possible.

Air quality

Improving indoor air quality has never been more important given the increased amount of time New Zealanders have spent at home in recent years.. Reducing or quitting smoking is another way to reduce air pollution for us personally, as well as those around us.

Government action

Governments play a pivotal role in protecting the environment. They are uniquely positioned to deploy large-scale measures that fundamentally impact health and wellbeing.

Governments can help to strengthen the global response to environmental challenges, by engaging with international efforts. For example, New Zealand is party to The Paris Agreement, which aims to respond to climate change by targeting increasing global temperature.

Effective policy design and implementation is an upstream approach that can lay the foundation for simultaneously reducing the risks of NCDs and protecting the planet. This interplay must therefore be considered upfront to ensure that win-win interventions are woven into the design.

Governments can incentivise urban design that encourages physical activity to reduce the risk of NCDs, as well as reducing air pollution from vehicle emissions.

Governments should also consider evidence of the relationship between the built environment and mental health. The state of mental wellbeing, response to stressors, the ability to work productively, and to make contributions to the community can all be affected by factors such as the quality of public utilities, walking distance to public spaces, access to transport, and level of infrastructure.

Clearly, government policies and programmes are prime opportunities to integrate design and strategies that benefit health outcomes for people and the planet as part of a comprehensive government effort to tackling NCDs.

AIA New Zealand's actions

AIA New Zealand is focused on the critically important work of improving the nation's health outcomes, driving awareness of the importance of healthy behaviours, and helping New Zealanders live Healthier, Longer Better Lives.

This is underpinned by 5590+. That is, preventing the five major NCDs: cancer, diabetes, respiratory disease, heart disease and poor mental health – by improving the five modifiable factors that underpin these: physical inactivity, poor nutrition, smoking, excess alcohol and our interaction with the environment.

As a life, health and wellbeing insurer, AIA has invested heavily in developing programmes that support New Zealanders to maintain and improve their health throughout their lives. To help people be healthier for longer and improve their overall wellbeing, AIA New Zealand has built an ecosystem of products, services and partners through five stages:

Our shared-value approach means we put our efforts into projects and interventions that benefit not only our customers and business but society more broadly.

"Planting native trees is one of the most significant actions we can take for the physical and mental wellbeing of New Zealanders: both in a long term, global sense, and to benefit our local communities. Our partnership with AIA is not only enabling us to get thousands of native trees in the ground, but also raise awareness of the benefits of this mahi with New Zealanders.

Melanie Seyfort, Trees That Count

Where to from here?

AIA New Zealand is inspired by the opportunity to improve our environmental impact, as well as empower our customers and all New Zealanders to try to make a difference

AIA's global scale positions our organisation in a powerful position to be able to amplify even small changes for significant impact. We embrace this privilege and responsibility as we unwaveringly innovate to deliver solutions for our people and our planet.

As part of the AIA Group's overarching Environmental, Social and Governance (ESG) strategy, AIA has committed to achieving net-zero GHG emissions by 2050. AIA has also committed to the Science Based Targets initiative (SBTi), a global body enabling businesses to set ambitious emissions reduction targets in line with the latest climate science.

Research shows that by planting trees we can help to improve the environment in which we live. Trees draw carbon dioxide out of the environment, they are critical in controlling regional rainfall, they sustain the animal ecosystem responsible for food sources, and in urban areas, they help to cool and to reduce air pollution.

It is estimated that planting one trillion trees globally could arrest the effects of climate change.

AIA New Zealand is partnered with Trees That Count (Te Rahi O Tāne), managed by environmental charity Project Crimson, and to date have funded the planting of over 10,000 native trees around Aotearoa.

Planting native trees is one of the powerful actions we can take to combat climate change, whilst protecting our beautiful landscapes, waterways and forests for future generations.

NZ native trees improve our mental wellbeing and our physical health by offering a natural playground for tramping, climbing, picnicking, walking and cycling. They improve the quality of our air, absorbing carbon dioxide and emitting oxygen, and help clean up waterways, protect downstream ecosystems, and help reduce flood risk. Native trees provide habitat and food sources for our native birds, bees, insects and invertebrates, and can contribute to nutrient recycling by absorbing nutrients from intensive agriculture. They are vital for stabilising soils, reducing sedimentation, moderating erosion, offering greater indigenous biodiversity with greater resilience and a bigger range of functions within our ecosystems.

Furthermore they are culturally significant in Māori heritage and myth; they're part of our whakapapa in the domain of Tāne Mahuta. For all of us, native trees provide a sense of wellbeing and belonging that reminds us of what it is to be a New Zealander.

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