



## New Shoots: people making fresh choices in a changing world

This collection of blogs is based on the new book by Patricia Lustig and Gill Ringland, "[New Shoots: people making fresh choices in a changing world](#)".

### A world of few children



Image by [Gerd Altmann](#) from [Pixabay](#)

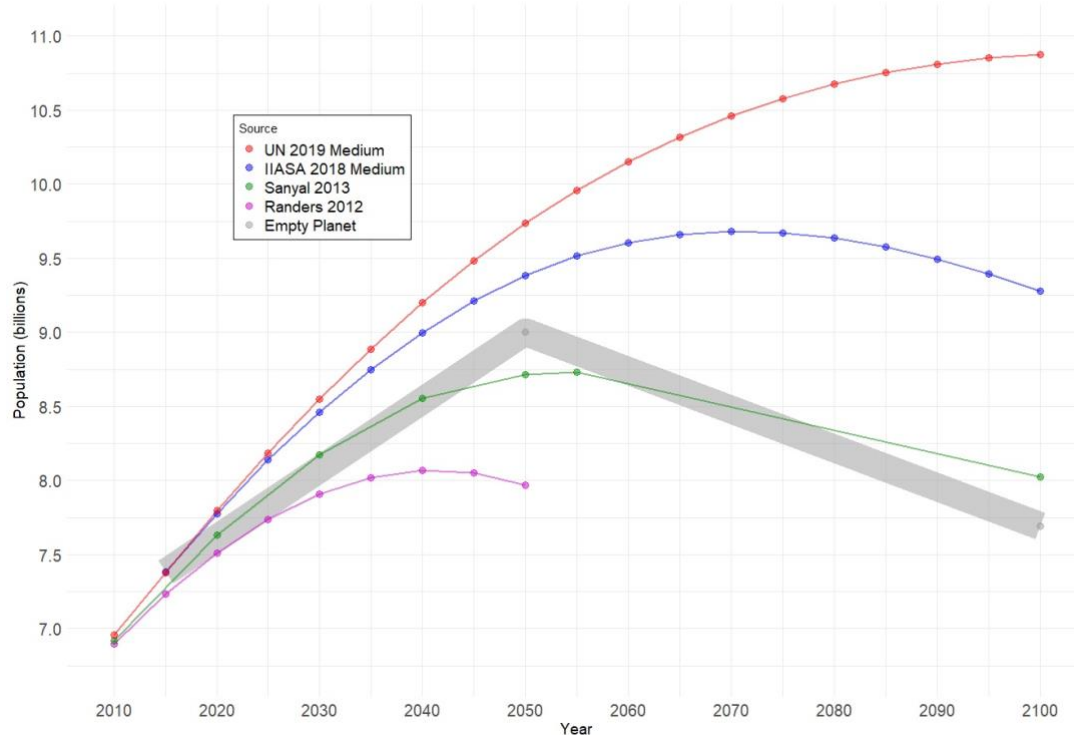
This blog first appeared, in July 2021, as a Pamphleteer in the Long Finance series, <https://www.longfinance.net/news/pamphleteers/world-few-children/>.

Demographers are starting to talk about global population decline, with alarm. Why is it alarming? We know that the world has gone through periods of catastrophic population decline before, due to volcanic eruptions and plague. These caused population decline by killing large numbers of people. This time it is different. Our new phenomenon of a declining population is not only about the numbers, but also about the changing age profile of society. As such, it introduces totally new societal challenges and structures.

Some of the estimates of global population to the end of the century are represented in the graphic below.



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Global Population Forecast

The differences in forecasts are mostly due to differences in assumptions about fertility rates rather than assumptions about longevity. In most regions, the picture is clear, with decreasing fertility rates. Even in India, the fertility is now 2.1%. It is below replacement in many places, with many women choosing to have only one or no children. Much of the uncertainty in the forecasts relates to the speed with which Africa becomes urban, with the corresponding drop in the birth rate. One effect of the decline in fertility is that already there are globally more people aged 65 or over, than those of 5 or under. Even the USA will have, for the first time ever, more people over the age of 64 than under 15, by 2030. Firms and governments in many parts of the world are starting to plan for this – or as in China, trying to reverse this.

What will this society increasingly dominated (numerically) by older people feel like? What does this Ageing World mean for society? Does it become more risk averse? What does it mean for health systems? For infrastructure? For peoples' jobs and careers? Camilla Cavendish in *Extra Time* questions that an ageing society is necessarily poorer and sadder, with people getting frailer and duller.

We like to talk about some role models for an ageing society. Benjamin Zander continues to work in his 80's, conducting and speaking to audiences about the Art of Possibility. He says, "Humans are addicted to possibility". Warren Buffet is preparing to hand over the reins at Berkshire Hathaway at the age of 90. And while Nobel Prizes are often awarded late in a person's career, the oldest recipient so far is 90 year old Professor Leonid Hurwicz in Economics. Jane Goodall, born in 1934, is still



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active, for instance lobbying the EU about caged farm animals. Anthony Fauci, born in 1940, became famous during the Covid-19 pandemic crisis for displaying calm leadership. Born in 1925, German native Johanna Quaas is the oldest active gymnast in the world. Finally, Yuichiro Miura climbed Everest, aged 80.

So an ageing society *can* encompass energy, activity and creativity.

At the other end of the age range, what does it mean to be part of a small family or an only child? What differences might a preponderance of only children mean to society?

A study of 303 college age young people in China – about half only children, the others with siblings – included MRI brain scans and personality tests. It revealed significant differences in the participants' grey matter volume as measured by the brain scans. Only children showed greater supramarginal gyrus volumes – a portion of the parietal lobe thought to be associated with language perception and processing, and which in the study correlated to the only children's greater flexibility. By contrast, the brains of only children revealed less volume in other areas, including the medial prefrontal cortex (mPFC) – associated with emotional regulation, such as personality and social behaviours – which the team found to be correlated with lower scores on agreeableness.

The study is of course limited in size, scope, education level and age range of the participants. It does however pose some interesting thoughts. If the conclusions are more widely applicable, how can society manage with fewer people able to act as social glue, by displaying agreeableness? How can society benefit from the creativity of only children in an ageing society? How might society create a synergistic alliance between the creativity of an energetic ageing society and that of only children?

These are among the topics we raise in *New Shoots – people making fresh choices in a changing world.*

*Written by Patricia Lustig, SAMI Principal and Gill Ringland, SAMI Emeritus Fellow  
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## Planetary Limits – fresh choices

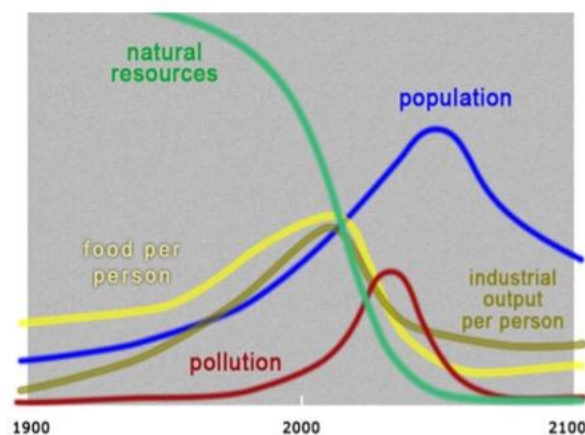


Image by [Mystic Art Design](#) from [Pixabay](#)

The 1970's classic volume [Limits to Growth](#) has influenced futurists and policy makers for a generation. Recently the assumptions in the computer model behind the conclusions, and the [conclusions themselves](#), have [attracted a flurry of interest](#).

We explored the *Limits to Growth* assumptions and conclusions for our book *New Shoots*, which is due to be published in October. What we concluded was that some of the assumptions and conclusions in their core scenario "Business as Usual" (see below) still hold.

### Business as Usual Scenario





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For instance pollution of air, water, and land is a major concern and is estimated to kill more people each year than the Covid-19 pandemic in total so far.

Industrial output per person – definitions of productivity for the knowledge economy are difficult but conventional measures of industrial productivity have stalled.

The most notable divergence of the actual situation now from the model is that the food per person has continued to increase and has not collapsed as the model predicted. Food shortages today are local and largely due to losses in the supply chain (estimated at up to 40%) rather than due to inadequate worldwide production. The improved food supply has been achieved through a combination of public awareness, globally-based scientific advance ([the Green Revolution starting in the 1970's](#)) and support from governments.

*Limits to Growth* assumptions were of their time, when people had less choice. Since 1970 more people have been able to exercise choices; their incomes have increased as they benefit from planetary economic growth. This is illustrated by the fact that predictions for the world's population now are for it to peak in this century and then to fall slowly. The model forecast a sharp decline due to food shortages. What is actually happening is that women are choosing to have fewer children.

The most dramatic prediction of the *Limits to Growth* model was the catastrophic exhaustion of natural resource. Certainly, some natural resources are near exhaustion – lithium is causing concern as we write. But when we started to explore one of the natural resources often flagged as being in crisis – water – we found that the evidence was complex.

Water shortages have hit the headlines. Perhaps the most publicised was when Capetown in South Africa was facing DayZero – when it would run out of water, on April 12<sup>th</sup>, 2018. A number of factors averted this, including diverting water from agriculture, publicising water maps at household levels and “dirty shirt” challenges (who could wear a shirt without washing it the for the longest time). These measures pushed DayZero back until June, by which time the rains finally arrived.

The role of water is discussed in an excellent [BBC4 series “H2O: the molecule that made us”](#). What we know is that [global average rainfall has increased slowly since 1900](#); that climate change is having [the effect of making wet regions wetter and dry regions drier](#); and that [weather \(including rainfall\) is becoming more erratic and extreme](#).

Since 1900, [the world's population has approximately quadrupled](#). [Better standards of living increase a person's “water footprint”](#). Can water supplies meet the demand over the next decades?



Many water supplies are from aquifers and glaciers. Worldwide, aquifers are not being replenished as fast as water is being extracted. Glaciers are shrinking due to global warming. The sources mostly used for water are under threat. Water is bulky and not usually transported long distances. So water shortage has all the makings of a “wicked” problem, one which has only bad solutions.

But.....

The precipitation falling over land each year is [approximately 35,000 bn cubic metres](#). Usage is [approximately 4,350 bn cubic metres pa](#), about 12% of the rainfall each year. So would this suggest one avenue for at least a partial solution to water shortages? To harness more rainwater? This has often been implemented as a household level activity and would need to be scaled up to tackle the shortfall. We see few New Shoots of planning to harness rainfall at the scale needed.

A small positive example is taken from El Hierro, an island in the Canaries. More than 20 years ago, the government planned to relocate the 11,000 inhabitants, but they decided on a different future. Their first project was to become self-sufficient in energy and water. They chose windmills and water basins with height differences as their method for energy supply. “Free” energy allowed them to desalinate additional water. And they merged the energy and water companies to prevent conflict of interest. Developments followed in agriculture, sustainable fishing, a winery cooperative and a methane biodigester which turns waste into energy and fertilizer. They offer visitors gastronomy, paragliding, hiking trails, and scuba and volcano diving.

To conclude, we were surprised when we checked the world’s water usage against planetary rainfall. It reminded us yet again to check the evidence.

Backup data and the [examples are to be found in the Pearltrees](#) associated with [New Shoots – people making fresh choices in a changing world](#).

*Written by Patricia Lustig, SAMI Principal and Gill Ringland, SAMI Emeritus Fellow  
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## Global Warming – Is The Ship Turning?



Image by [Gerhard G.](#) from [Pixabay](#)

This blog first appeared last week as a Pamphleteer in the Long Finance series, <https://www.longfinance.net/news/pamphleteers/global-warming-is-the-ship-turning/>.

As COP26 approaches, we are wondering if there are any signs that the juggernaut of global warming may be turning. Will organisations, governments and people decide to act? Will these efforts be enough to halt the warming trend?

Scientists have been tracking global warming and warning of potential consequences since 1988. The scientific framework for understanding the cause of global warming is the subject of John Houghton's *Global Warming*. A significant contributor is emission of pollutants (including greenhouse gases or GHGs) into the atmosphere. Initiatives to reduce global warming focus on reducing emissions of CO<sub>2</sub> and methane (CH<sub>4</sub>) and developing carbon capture methods.

Generation Z and Millennials such as Greta Thunberg have been highlighting the issue of global warming more recently. Sarah Jaquette Ray, Professor of Environmental Studies, describes how Generation Z are approaching global warming. "Generation Z students care a lot more about humans than previous generations. They flock to environmental studies out of an awareness that humanity and nature are deeply interconnected and a genuine love for both. These students are increasingly first-generation Americans, non-white and motivated to solve their communities' problems by addressing the unequal distribution of environmental costs and benefits." She adds that the rapid and radical changes that society has



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undertaken in response to the Covid-19 pandemic is evidence that change is possible.

Some Investment funds have claimed to be focusing on 'green' industries, while the ESG descriptor is being viewed critically. Until recently, however, it is probably fair to say, there has been more talk than action.

Now people, governments and organisations have started to ask what will it cost to contain and reverse global warming, to turn the ship? A friend who sold computer systems told us that once a prospect asked the price, she knew she had a customer. We think this is a similar signal, a sign of plans for action on carbon emissions.

One question is whether reducing economic activity alone could turn the ship. The evidence from the Covid-19 pandemic, which curtailed economic activity across the planet, was that it reduced the CO<sub>2</sub> emissions from travel and the industrial use of fossil fuels. About 8% of the projected total for 2020 will never be emitted into the atmosphere, according to estimates by the International Energy Agency. However, according to Carlo Buontempo, director of Europe's Copernicus Climate Change Service, "Because of the inertia in the climate system, even if we were to significantly reduce or stop our emissions today, you would still see the expected increase in temperature for the next 20 years to be almost unaffected. In reality it is very likely that the total concentration of CO<sub>2</sub> in the atmosphere will continue going up in the future."

Bill Gates' book *How To Avoid A Climate Disaster: The Solutions We Have And The Breakthroughs We Need* highlights that between us, we humans generate 51 billion tons of CO<sub>2</sub> each year. So to halt (without even reversing) the incremental global warming effect of CO<sub>2</sub> emissions each year, the planet's economy needs to remove 51 billion tons of CO<sub>2</sub> each year. About three quarters of this comes from industry, electricity generation and agriculture. The rest comes from transport and from the heating and cooling of buildings.

Breakthrough Energy, Gates' climate fund, has laid out four different uses for his planned \$1.5 billion investment: developing green hydrogen fuels, sustainable aviation fuels, energy storage, and technologies that take carbon dioxide out of the air.

The concept of a 'green premium' can be used to estimate the costs of de-carbonising each sector. This premium is lowest for heating and cooling of buildings, which means that design of new build and insulation of older buildings are obvious targets. Similarly, the design of electric or hydrogen powered passenger cars, buses and trucks is relatively easy. And in *New Shoots* we provide snapshots of companies piloting systems to reduce carbon emissions in 'wicked' sectors like steel manufacturing and agriculture.





The Earthshot Prizes announced recently included one directly addressing climate change. It went to a German company, Enapter. They have already delivered their scalable plug & play AEM electrolyser modules – which turn renewable electricity and water into green hydrogen – to 33 countries. Other finalists were Reeddi Capsules, from Nigeria, making solar-powered energy capsules to make electricity affordable and accessible in energy-poor communities, and SOLbazaar, Bangladesh, who have the world’s first peer-to-peer energy exchange network in a country on the front-line of climate change. The prizes were specifically to support scaling up of proven technologies.

We think that these new shoots suggest that the ship is turning. The new visibility of the attitude of Generation Z, the focus on “what will it cost”, massive investment in four key technologies, discussion of easy and wicked sectors using ‘green premia’, and prizes to aid in scaling up – two years ago we did not see any of these. Today we are more optimistic.

*Written by Patricia Lustig, SAMI Principal and Gill Ringland, SAMI Emeritus Fellow  
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