

## Population and climate change

### Introduction

Climate change is the long-term alteration of weather patterns affecting our planet. In the modern world this occurs largely due to human produced greenhouse gases, such as carbon dioxide and methane, which trap heat in the atmosphere and alter the earth's climate. The range of impacts this will have on the planet is hard to quantify but includes more extreme weather events, resource scarcity and sea-level rise. However whilst climate change receives a great deal of media and scientific attention, it masks a wider problem. By 2050 the world population will reach around 9 billion. This is not only a direct cause of climate change but will exacerbate each of its associated problems.

### Linking climate change and population

Climate change is caused by greenhouse gas emissions trapping heat and altering weather patterns. Every person on the planet causes carbon emissions through consumption of products and energy. At the most basic level, more people on the planet means more consumption, more emissions and heightened climate change.

Most of the emissions currently in the atmosphere come from developed countries such as the UK or USA as they have been industrialized for longer and have higher levels of consumption. However due to the total number of emitters, population growth in the developing world means they will at some point overtake the emissions from western countries where growth is lower.

As well as causing climate change by producing more emitters, population growth exacerbates every other issue associated with changing weather patterns. For example, climate change affects biodiversity levels by taking species outside of their ecological limits. At the same time, increasing demand for

space and resources means human population puts ever more species at risk by destroying natural habitats. Plants and animals are then confined to smaller and noncontiguous areas, resulting in inevitable extinction.

As atmospheric carbon dioxide rises, a greater proportion is dissolved into the oceans. Through buffering from existing oceanic carbon, this dissolution causes ocean acidification. This affects fish, corals and other species. Again population growth has a multiple impact on these species as more people place more demand on marine resources for food and livelihoods. This can lead to mismanagement and problems such as the collapse of North Sea cod stocks.

### Issues of time and space

The dangers of population growth are not just felt immediately or confined to one place. The legacy and patterns of growth greatly affect the impacts of climate change. Climate change is a problem that will be felt far into the future, even if emissions were to stop today. Transient climate response means it will take centuries for a new equilibrium to be reached. The same is true of population growth. By having a large family, not only do you produce an immediate effect of more people, but also the legacy of further births will be felt infinitely into the future. This creates a legacy of rising consumption and emissions.

The impacts of population growth and climate change are also felt spatially. Immigrating or choosing to have large families in countries such as the UK or USA has more detrimental effects on the climate than in developing countries. This is because per capita emissions are higher in the developed world. Addressing the drivers of emigrating from lower-income countries can help reduce emissions driven by growth in carbon-intensive countries.

The issue of space is further felt in a greater amount of people living in at-risk areas. Climate change increases risk from flooding due to more storms and higher sea level. As population continues to swell, housing pressure means more people have to live on floodplains or other dangerous areas. The effects of climate change also act as a driver of migration creating large amounts of refugees that will cause pressure on other regions.

### Resources

Climate change poses a great threat to our natural resources. A warmer world, with more seasonal and inconsistent patterns of rainfall will heighten water scarcity. This in turn will affect agricultural productivity and our ability to feed the world. This is before considering that the current population already consumes almost three earth's worth of resources. A burgeoning population will require even more resources at a time when they are becoming less and less available. This huge increase in demand and drop in supply is likely to promote mismanagement affecting equity around the world and for future generations. Due to the traditional market mechanism, changing both demand and supply will promote a double upward pressure on price levels, meaning basic human rights may become unaffordable to the majority.

At the same time, a larger population means more people requiring energy. In order to limit the impacts of climate change, traditional fossil fuel derived energy reserves such as oil and gas need to be left untouched. However, the rate of introduction of clean energy is unlikely to keep pace with the rate of population growth which means dirty, non-renewable fuels will continue to be used.

### Solutions

Acknowledging that population growth not only causes climate change but exacerbates each of its problems opens up new and affordable ways to adapt and

mitigate climate change. The first stage to addressing this problem is to acknowledge it in the media and academic circles. Currently 97% of climate scientists agree about the dangers of climate change but this falls to 80% in regards to population growth.

By having a smaller family, not only are individual household emissions reduced, but so is demand for natural resources. This then has a knock-on effect for future generations, helping to consistently reduce population to a sustainable level. Promoting smaller families should be achieved through limiting child subsidies and education on the benefits and costs associated with different family sizes.

Improving sex and relationship education in schools, including lessons on the impact of population growth on the environment, can reduce the effects on climate change. This will also help to reduce the high level of unintended pregnancies that create more emissions and a greater demand for consumption.

As the largest increase in emissions is coming from the developing world, improving access to family planning, contraceptives and sexual education in these countries will make a major contribution to future emissions reductions. In parallel to this, improving female empowerment and their right to choose family size will also help address problems of climate change, population growth and female equality. In this way improving career options for women is another strategy for reducing the impacts of climate change.

Addressing the drivers of population growth provides win-win scenarios for equity and climate change.

### Conclusions

The world's governments have agreed to limit future climate warming to 2°C, as a certain level of carbon emissions cause a

set amount of climate warming. This gives rise to the idea of a climate budget or set amount of carbon that can be burnt to limit climate change.

A rapidly growing population will not only make it impossible to keep to this target due to higher levels of consumption and energy demand but will also exacerbate the associated problems of exceeding it. Resource stress, biodiversity loss, food and water scarcity and pressures on space are all at threat from the double jeopardy of population growth and climate change. Acknowledging that population growth not only causes but compounds climate change gives rise to new methods to militate against future impacts. These include:

- Having smaller families
- Promoting access to family planning and contraceptives
- Better and compulsory sex and relationships education in schools
- Female empowerment strategies
- Addressing the push factors behind migration
- Reducing consumption

In order for this to be effective, population growth should be an integral part of future climate negotiations.