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## OPINION

### **Some good news on global population growth**

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*There is a long history of predicting the downfall of civilization, and all previous doomsayers have been wrong.*

**Matt Ridley** – ‘The Rational Optimist’, 2010

In recent years, we have been beset with fears of future global overpopulation overwhelming the earth's ecological system and producing shortages of energy, resources, water and food. Since the ‘Brundtland Report’ (United Nations 1987), sustainability has been a major long-term concern. Contemporaneously, climate change, wholly or partly human induced, is thought to be causing a warming of the planet, an increased incidence of extreme weather events, a reduction in agricultural yields, melting the ice caps, and rising sea levels which will eventually cause flooding of low lying islands and coastal districts.

From RUSI's geopolitical and national security point of view, critical shortages could be accompanied by competition between nations for scarce resources, civil unrest, particularly in the case of food and water shortages, uncontrolled migration and the possibility of armed conflict and failed states. Also, the tertiary effects of climate change would most likely involve the military in disaster relief and possibly climate wars.

But there is another story. The world population has increased exponentially since 1800, from less than 1 billion to 7.1 billion today, but the rate of increase is slowing and world population will probably peak at around 9–10 billion in the second half of the century. All the growth is taking place in developing and underdeveloped countries, while the populations of many developed countries are declining and ageing. Environmentalists' concern is that we will exceed the carrying capacity of the planet, and some believe we have probably exceeded it already. Put another way, we are using up natural capital by not properly pricing and accounting for it.

Lomborg (2001) has shown by analysing mostly United Nations' data that the environmentalists' litany of woe is almost always overstated, and generally based on short-term trends. By most criteria the aggregate human condition is improving. While globalization has increased the level of inequality in the world, both between and within countries, it has also resulted in a world in which everybody is healthier, richer, cleaner and living longer. Lomborg has argued that the vast majority of environmental problems such as pollution, water shortages, deforestation and species loss as well as population growth, hunger and AIDS, are area specific and highly correlated with poverty. They could be solved by economic and social development. Lomborg sees ending world poverty as the world's overriding goal, as aside from moral imperatives, eliminating poverty is positively linked to most other goals including adaption to climate change.

OECD (2012) projects the world economy at 2050 will be four times what it is today, consuming 80 per cent more energy with fossil fuel still accounting for 85 per cent of the total. But physical constraints of resource availability and the physical response of the global ecosystem may intervene and the economic growth projections are unlikely to be realised with current technology.

For the human impact on the planet to remain the same or decrease, efficiencies in production, transmission/distribution, consumption and waste disposal must be able to offset increases in population and rising standards of living. We need to ‘decouple’ impact on the ecosystem from economic growth. While relative decoupling is a normal productivity and efficiency outcome, absolute ‘decoupling’ of economic growth from ecosystem impact is difficult to achieve as efficiencies are passed on as price reductions which result in increasing consumption.

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<sup>1</sup> Mike Rawlinson is a councillor of the Institute. These are his personal views. This opinion piece is an edited version of an opinion piece first published in the *RUSI VIC Newsletter* **12** (4), December 2013, at pp. 5, 12.

The conventional economics approach to scarcity is in the interaction between demand and supply. Initially, a shortage causes an increase in price, as some consumers are prepared to pay more to secure scarce goods. This tends to reduce demand, but also calls forth further supply from higher cost sources. If demand still goes up, then price increases further and still higher cost sources are used to generate supply. As the price increases some demand is diverted to the purchase of existing substitutes or alternatives. Still further increases in price motivate investment in completely new alternatives to satisfy demand. Often, discoveries in the search for substitutes result in new products and services with even lower costs.

As an example, over the last 10 years the increasing price of petrol, relating to extraneous shortages, higher production costs, increased demand from the developing countries, the prospect of diminishing oil reserves, and public policy to curb carbon dioxide emissions, has seen car manufacturers tardily respond with smaller and lighter cars, much more efficient petrol engines, gas conversions, small diesel engines, hybrid/electric and electric motors. However, with the exception of battery technology, there have been no real technological breakthroughs, as most of these measures were available and only awaiting a market incentive to overcome corporate inertia.

Now consider the upside. Throughout history there have been waves of innovation that have raised the economic and social development of the civilized world. The last wave was in information and communications technology (ICT) and ran from about 1980-2001.

The most noticeable outward sign of this wave of innovation has been the exponential growth in the use of computers and mobile phones. Applications for the new technology are ongoing with developments in communications, health, education, and micro-finance offering huge productivity advances and increases in living standards in underdeveloped countries.

The ICT revolution merges into a new wave of innovation centred on resource efficiency, eliminating waste, internalizing externalities and selling services not products. While there are diminishing returns in production processes, there are no diminishing returns on the generation of ideas. The world now has more educated people than ever before, and through networked intelligence the ICT revolution has multiplied the potential for continued innovation by emphasising collaboration, openness, sharing, integrity and independence.

Current indications are that the potential of the new wave of innovation to solve emerging population/ human impact problems is very good. Future implications for energy, food, fresh water, resources, climate change and human well-being, are positive, but problems will still persist in specific areas, and for peoples who are unable to adjust and adapt to changing conditions.

There is considerable scope for increases in efficiency in the generation, transmission, distribution and use of electricity. Smart grids and the storage of electricity are needed to efficiently utilize intermittent renewable sources. While new shale gas/oil exploitation will ensure that fossil fuels do not run out this century, fossil fuels are non-renewable and there is merit in conserving them for future generations.

Development of renewable energy sources, ostensibly to reduce carbon-dioxide emissions, have produced significant advances in electricity generation by solar photovoltaic cells, solar/thermal, wind, and geo-thermal power generation. Awaited developments are in carbon capture and storage, and 4<sup>th</sup> generation nuclear reactors using thorium which offers the potential of a plentiful nuclear fuel with much lower levels of radioactive waste.

Today, almost 1 billion people are undernourished and lack access to fresh water, although we could adequately feed everyone now, given the political will to do so. The United Nations has calculated that at the level of basic nutrition the world will still be able to feed itself as the current population of 7.1 billion increases to 9 billion by 2050. The signs are that we will be able to do much better than this.

World agricultural production currently involves considerable inefficiencies in production, transportation, distribution and consumption, which when addressed will significantly increase the supply of most foods. Also, the subsidised growing of corn (maize) for biofuel has reduced the amount of grain available for human consumption. There is also the incongruity that sees a rising level of obesity and associated diabetes in developed and developing countries contrasted with near starvation in some underdeveloped countries.

The original green revolution was not fully exploited in all countries and many more could increase crop yields using existing technology. In particular, there is much arable land in Africa which

is underutilized and scope worldwide to increase yields by wider application of genetically-modified (GM) crops. Where suitable land is not available trials have had great success with vertical farming/horticulture in multi-story, factory/greenhouse, hydroponic farms.

On the protein side, beef is set to become more expensive as it uses a disproportionate amount of water to produce. While the fishing catch from the world's seas and oceans has peaked, the yield from aquaculture currently equals the wild fish catch and is increasing.

The basis of modern agriculture is land, fertilizer, fossil fuel and water. Earth is the blue planet, and there is plenty of water even though only 1% is available as freshwater in groundwater, rivers, lakes and swamps. The problem is not availability but accessibility to freshwater when and where it is needed.

Supplies of freshwater can be increased by desalination and new purification methods using nanotechnology, but there is considerable scope increasing efficiency in the use and transmission of freshwater, which is typically under-priced. Seventy per cent of the water is used in agriculture, mostly inefficiently. Where aquifers are being exhausted, human ingenuity needs to address the means of their replenishment. The conservation mantra of the '3Rs' (reduce, reuse, recycle) applies to both resources and water.

Development in underdeveloped countries has been held back by wars, tribalism, civil instability and incompetent, oppressive and corrupt governments.

A number of historical studies have found that the keys to social development are the hallmarks of liberal democracy (individual freedom, the rule of law, property rights, a free press, and free markets), openness and trade.

There is no current or emerging world population crisis or problem. Food, water and energy shortages are only likely to occur for limited times in specific areas. Things are getting better everywhere, and with networked innovation and globalized trade the pace of improvement is likely to quicken.

Future conflicts are more likely to be related to nationalism, religious fundamentalism and perceived inequality between developed countries with ageing populations and developing countries with young adult populations.

## References

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*On what principle is it, that when we see nothing but improvement behind us, we are to expect nothing but deterioration before us?*

**Macaulay, 1830**