



COMMISSION FOR THE
HUMAN FUTURE



SURVIVING AND THRIVING IN THE 21ST CENTURY

A discussion and Call to Action on Global Catastrophic Risks

Expert round table convened by The Commission for the Human Future

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A CALL TO ALL NATIONS AND PEOPLE

The Commission for the Human Future here calls on the nations and peoples of the Earth to come together, as a matter of urgency, to prepare a plan for humanity to survive and thrive, far into the future.

To do so, our first Round Table has concluded, it is essential that everybody understands and plays their part in solving the ten catastrophic global risks that menace our future, in ways that assure not only our survival as a civilization but also our well-being as humans and that of the Earth we inhabit.

Lately, we have had many warnings. Human activity and numbers are transforming our world. Wildfires, floods, droughts, melting ice caps, large-scale extinctions of plants and animals, shortages of water, loss of soil, forests and sea life combined with rising food insecurity, universal pollution, pandemic diseases, collapsing states, wars and refugee crises are a wake-up call that our very way of life is at risk.

The Commission for the Human Future has been set up by concerned citizens of the Earth to:

- Alert humanity to the nature and scale of the combination of ten catastrophic risks that face our civilization
- Help to devise integrated global solutions to these risks
- Identify fresh opportunities that arise from solving the threats
- Encourage global dialogue about the risks, their solution and opportunities
- Serve as a knowledge hub for the solution of global catastrophic risks

Especially, we recognise that solutions to the great risks depend not just on government policy and corporate activity, but also on the actions of billions of individual humans in their daily lives.

Much of our present behaviour has to change, if civilization is to survive and prosper. The Commission's goal is to share leading thought and ideas from all over the world about what society as a whole can do to build a safer, better future – and how we can each play our part to limit and overcome these risks. We must empower everyone, young and old, female and male, poor or affluent to help build a safe, sustainable human future.

This report summarises the discourse at our first Round Table event, which was held online on March 28, 2020. It is the first of many we intend to share, on the risks we all confront and ways forward for humanity. We welcome your support.

John Hewson
Chairman
Commission for the Human Future

PART 1: THE CHALLENGE

‘Only a crisis - actual or perceived - produces real change’ – Milton Friedman

At the conclusion of its first Round Table, the Commission for the Human Future issued an urgent Call to Action to the nations and people of the Earth to join together in overcoming the ten great catastrophic risks¹ which face humanity and our civilization as a whole.

The ten risks

We identify these risks² as:

- Decline of key natural resources and an emerging global resource crisis, especially in water
- Collapse of ecosystems that support life, and the mass extinction of species
- Human population growth and demand, beyond the Earth’s carrying capacity
- Global warming, sea level rise and changes in the Earth’s climate affecting all human activity
- Universal pollution of the Earth system and all life by chemicals
- Rising food insecurity and failing nutritional quality
- Nuclear arms and other weapons of mass destruction

¹ A catastrophic risk is one that menaces human civilization in general. An existential risk is one that may potentially extinguish the human species.

- Pandemics of new and untreatable disease
- Advent of powerful, uncontrolled new technologies
- National and global failure to understand and act preventively on these risks.

The human species’ ability to cause mass harm to itself has been accelerating since the mid-twentieth century. Global trends in demographics, information, politics, warfare, climate, environmental damage and technology have culminated in an entirely new level of risk. The risks emerging now are varied, global, complex and catastrophic. They all relate to the way we humans organise ourselves.

Their root causes include: a massive increase in population leading to vast overconsumption of resources; an economic system that incentivises GDP growth and ignores its negative impacts; the mismanagement of scarce resources; the passing of waste and damage to other countries or generations; domestic politics that is unable to plan for future generations; a global political system that fosters competition in the military and economic domains and societies that foster large populations leading to rising levels of waste, disease and diminished resilience.

The group recognised that all these risks are interconnected and therefore cannot be solved one at a time. It is a systems issue. All risks must therefore be solved

² For a detailed description of these risks, potential solutions and pathways see [Surviving the 21st Century](#), Springer 2017.

together, as a system, at the same time and in ways that make none of them worse.

We assert that, at present, no nation or government on Earth recognises all of these threats as a related complex, nor does any have an explicit policy for human survival. We consider this needs to change, urgently, to focus world attention on what needs to be done.

Coming on the heels of severe climate impacts around the world, including droughts, floods, storms and fires, the coronavirus pandemic is a wake-up call to all of humanity that we need to do things differently. It is a warning of how the ten risks may compound each other to strike us successively and simultaneously as we approach the mid-21st Century. The pandemic also presents an opportunity to change the way we see our world, how we respond as humans to the self-created dangers we face and the opportunities we can seize or create as we go forward together.

The following points emerged from our discussion of the threats. The paths we need to take in addressing them and the solutions we need to adopt to make safe the human future are discussed in Sections 2 and 3.

Climate change

Climate change is primarily driven by the emission of greenhouse gases from the combustion of fossil fuels and clearing of land. These gases are altering the energy balance of the Earth System, with many serious changes to the entire Earth

System leading to increasingly severe impacts on human societies and all life on the planet.

An over-riding issue for humanity is the need to halt, and preferably reverse, human-induced climate change. Unless a global emergency response is implemented to reduce carbon emissions, civilization as we know it will collapse. Unfortunately, few governments or industries are yet taking action at the scale and speed necessary.

Climate change is happening faster than previously anticipated, driven by rising human carbon emissions from fossil fuel combustion, agriculture and land clearing, superimposed on natural variability. It has intensified extreme weather events around the world. Both the speed and scale of its impact have been badly underestimated, physically and economically.

Dangerous climate change is occurring at 1°C average global warming. Extremely dangerous climate change is likely at 2°C, which may be reached by 2035. With current global policies, 3°C warming is likely by 2050, producing a world that national security experts consider spells social chaos. These policies will lead to +4°C warming before 2100 creating a world which the same experts consider will result in the collapse of human civilization.

Inertia in the global climate system means that the impacts of our present emissions do not appear for years. By the time they become clear, it is too late to take avoiding action. It is impossible now to avoid increasingly severe climate impacts

from our past emissions. The immediate challenge is to prevent matters becoming far worse, and to adapt to impacts that cannot be avoided.

There are several drivers of climate change including population, consumption, short-termism, parochialism, power imbalances, corruption, and poor governance. Consequently, inertia in climate action is widespread both at national and individual level. Denial of climate science, whether motivated by ignorance or self-interest, remains a grave barrier to human safety. We need to build a much higher level of both governmental and community response to these challenges than we have seen thus far.

Environmental decline and extinction

Growing evidence suggests that human changes to the Earth's environment are driving the planet's Sixth Great Extinction and are now so profound that we are entering the third stage of evolution of life on Earth.

The global degradation of biodiversity is truly staggering and planetary in scale. The Earth's terrestrial vegetation has halved over human history, losing one fifth of this realm's original biodiversity. Up to 70% of the Earth's land surface has been altered by humans. Some 700 animal and 600 plant extinctions have been recorded and many more have likely gone extinct unnoticed. Since 1970, 60% of all land animals have disappeared. At least a million species are facing extinction out of a probable Earth total of around 8 million. Wild animals today are less than a

quarter of their biomass before human civilization arose.

Most of the world's present nature protection and recovery targets are on track for failure. Ecosystem services and the species that provide them are declining globally.

Globally, our ecological footprint means that we now consume 1.75 times the regenerative capacity of the Earth to provide the goods and services we use each year. This is not sustainable, either for humans or for nature and the ecosystems which support life on this planet.

Events like the COVID-19 pandemic show how human interaction with and damage to the wild world can result in new dangers to ourselves, when novel viruses transfer from ruined wilderness to take root in the human population.

Present monetary and economic systems are in conflict with the need to maintain a natural world which is capable of sustaining humanity. They need to change accordingly. This will involve a greater emphasis on co-operation across human communities and deeper links to the natural systems which support our lives.

This requires far greater attention and focus on the security of the natural world: the security of ecosystems and habitats on which we all depend. For example, if we lose the Amazon, the fate of all humans will be harmed. Without negating the importance of human rights, we have to develop a far more eco-centric view of the way forward rather than an exclusively anthropocentric one.

Nuclear weapons

Nuclear weapons pose the greatest immediate threat to human health and welfare. They have the capacity to destroy the human future in an afternoon. Unless they are eliminated, they will be used again.

There are 13,890 nuclear weapons in the global stockpile. Around 2000 are on hair trigger/high alert for immediate use. Detonating less than 1% of this arsenal would cause an abrupt ice age and a global famine affecting everyone.

The danger of nuclear war is growing. In 2020 the hands of the Doomsday Clock were moved to 100 seconds to midnight, closer to global disaster than they have ever been. The hard-won agreements that constrained nuclear proliferation are being dismantled, arms and technology races are ratcheting up and explicit nuclear threats are escalating. Arms makers are recruiting the 'best and brightest' young minds to help build more devastating weaponry.

The nine nuclear-armed states are modernising their arsenals with new weapons, technologies and fresh capabilities, such as AI, which lower the threshold for their use. While there is widespread support for nuclear disarmament and 36 countries have ratified the UN Treaty on the Prohibition of Nuclear Weapons, the Treaty does not come into force until 50 states ratify it. Nine nuclear armed states and 30 'nuclear dependent' states (NATO members, Japan, S Korea and Australia) currently oppose the ban treaty. As things stand, a nuclear war that wrecks civilization or

even eliminates humanity remains a distinct possibility.

The Round Table felt one could be forgiven for thinking that the only priority in national security nowadays is the 'security of the state'. Instead, it was argued, we need a concept of national security that begins with the personal safety and well-being of all citizens – 'human security'. Unless we start to move away from conventional definitions of national security, we are not going to solve this.

Humanity has to start thinking about security differently from the way it has been framed historically. This raises the debate to the point where the future of the nation state depends on global cooperation in the face of all the risks that we are discussing.

Resource scarcity

The human population, now 7.7 billion, is forecast to reach 10 billion in the 2050s and 11 billion by 2100, leading to spiralling consumption, degradation and wastage of overstretched resources.

Total human demand for resources has increased 40-fold in the past 120 years and is likely to redouble again by the mid-century. For example, while the human population has tripled since the mid-C20th, our demand for water has grown sixfold.

Currently our annual consumption includes 3.8 trillion tonnes of fresh water, 17 billion tonnes of mineral, construction

and energy products, 5.8 billion tonnes of forest products and 5 billion tonnes of food. Only a very small part of this is recycled or re-used. Total waste production is estimated at 10-11 billion tonnes a year.

As previously mentioned, humanity is currently consuming 1.75 times the regenerative capacity of the Earth every year. If everyone lived at US or Australian living standards, we would need *five planets* to satisfy our combined demands.

Yet issues such as recycling of materials, water and nutrients, the reduction of waste, the control of pollution, and the 'circular economy' continue to suffer a low priority among both governments and civil societies around the world. Some cities and local communities display a higher priority – but overall, the performance is far below what is necessary for human civilization to survive and flourish in the longer term and to avoid the scarcities and harms that will inevitably arise from our extract-pollute-waste system.

Food insecurity

Global food security is on a knife-edge due to massive soil loss, growing water scarcity, ecosystem decline and climate change. The COVID-19 pandemic has exposed the fragility of the global industrial food chains which feed the megacities, raising the spectre of scarcity amid plenty.

Everybody needs to eat, every day. History shows that, if they don't, wars

break out. The Spanish have a saying that "There are only seven meals between civilization and anarchy." Food is at the heart of all of the catastrophic threats. It connects them all. Two thirds of the wars fought in the last 100 years originated in disputes over food, land and water. Already a third of a billion people are moving from insecure to more secure regions of the world every year.

Humanity currently produces around 5 billion tonnes of food a year, up to 2 billion tonnes of which is wasted. Food production is one of our biggest impacts on the Planet. Two thirds of the world's available fresh water are used to grow food and a global water crisis is fast approaching as the megacities consume more of the water that farmers need to grow crops. Food production and distribution generates 30% of world climate emissions. One third of the world's farming soils have been lost since 1970, and up to 75 billion tonnes are shed every year. Ocean fish catches have been dwindling for 25 years. The stable climate in which agriculture was born is now extinct and a far more unreliable era has begun.

This means our conventional food system is failing. It will be unable to feed 10 billion people on a hot, resource-stressed planet. Global diets and food production methods must change.

Like renewable energy, the world needs a renewable global food system that recycles nutrients and water, feeds everyone and ends food scarcity, based on regenerative farming, urban food production and deep ocean aquaculture. Such a system would not only feed

everyone, it would also release 25 million sq. kms for rewilding and reforestation, thus helping to end the 6th Extinction. By securing sustenance for everyone, it can help prevent most wars.

Regenerative agriculture and grazing can also restore the soil and farming environment. This will draw carbon out of the atmosphere, to increase soil fertility, save water and help to slow global warming.

Dangerous new technologies

A wide array of advanced technologies is having a profound effect on the Planet and all life, including our own. These range from chemical pollutants to radioactive nuclides and plastics to intangible but real threats such as artificial intelligence, robot killing machines biotechnology, nanotechnology and electromagnetic radiation that are entirely new to the Earth System and may potentially alter the evolution of life on our planet.

Digital technologies like Artificial Intelligence contribute to many catastrophic risks. Fake news is distorting the discussion around the climate emergency. Machine learning is being used to manipulate elections or increase resource consumption. 'Big tech' is increasing inequality and creating a "digital divide" within society. Facial recognition software, data mining, AI and quantum computing are being used to spy on, manipulate and control populations.

None of these technologies are adequately overseen by society or sufficiently governed by regulation in the public interest. While most deliver palpable benefits to society, all are capable, if misused, of making other risks worse.

Governments have lost their way on how to frame public policy on such matters. The fragmented national leadership we currently have is incapable of managing global problems of the scale of those which now confront us. It is going to take a major change in pressure from the community at large to force the types of changes that are really necessary. What we lack at the present time is any kind of coordinating element that can bring different groups together across the community. Society needs to develop greater cohesion and unanimity, to ensure that governments act in the best interests of humanity.

The grassroots are of central importance in this. There is a need to develop a public narrative on science and systems – and all the opportunities that are opening up around these catastrophic and existential threats. There is a growing interest in participatory democracy. The OECD has recently conducted a big study of 755 participatory democracy projects around the world. One of the key things that has come out of that is that when ordinary people are presented with a range of expert views, they can make very sensible decisions. Hyper-local activity, such as kitchen-table conversations, will be of great importance.

We need the kind of public discussion of these great issues that cuts through

conventional politics and parochial interests in a way that we have never seen before.

Overpopulation

In 2020 the global population will reach 7.77 billion, at an annual rate of growth of 1.05 per cent. Populations growing at 1 per cent per annum double every 70 years. Without a decline in growth to 0 and below, the human population would exceed 15 billion by 2090.

Luckily, the rate of growth has been easing and UN's medium population projection for 2100 is 10.9 billion – 42 per cent higher than our current numbers. However, concerns about 'the ageing population' are leading many governments to promote growth in birth rates.

Exponential growth in both population and consumption was inevitably going to lead at some point to a crisis in human affairs. Such concerns have been raised repeatedly, inter alia Thomas Malthus in 1798, the Club of Rome in 1972, and Julian Cribb in 2017. All of which have been ignored as the global community constructed an economic system of perverse incentives guaranteed to ensure its own destruction.

There are now too many people on the planet using too many resources and producing too many risky wastes.

Human population growth at current levels exacerbates all other threats. Its seriousness, and preventability, are not being addressed in any country or

internationally. The key question is "How can we slow both population growth and its impact in ways that can enable survival and prosperity for all?"

Lowering the human birth rate voluntarily is surely better than the alternative of massive dieback or slaughter of billions of people in their prime.

Universal pollution by chemicals

The number, variety and volumes of chemicals produced by humankind has risen exponentially since the beginning of the 20th century. They are now found in the air we breathe, the food we eat, the water we drink, in mother's milk, and in wildlife in the most remote parts of the planet. Many of these chemicals are relatively stable and long-lasting and can accumulate in animal and human tissues.

Humanity releases between 120-220 billion tons of chemically-reactive substances every year – from three to five times more than our climate emissions. These emissions are cumulative. Very few people have any idea of the scale or impact of our combined emissions on human health or the stability of life on Earth.

There is increasing evidence that this chemical outpouring poses a risk to human existence – because long term exposure to apparently non-toxic amounts of some environmental chemicals has been shown to contribute to the development of cancers, autoimmune, developmental, reproductive and neurological diseases.

Because of their possible impact on our health and wellbeing, steps have to be taken to reduce the quantity, range, toxicity and mixing of chemicals in the human environment. Global awareness is absolutely critical on this issue, if it is to be resolved safely. The circular economy and ending fossil fuel use are vital steps.

Pandemic Disease

The coronavirus (COVID-19) is the latest example of a disease pandemic that doctors and environmental health researchers have warned about for decades. There have been seven pandemics since the start of the 21st Century.

Pandemic diseases generally arise in the first place as a consequence of human overpopulation, destruction of forests and the wild world, increased trade in wild animals, farming practices, international transport and dense urban living conditions. All must be addressed to limit the risk.

This pandemic, in particular, highlights the devastating combination of an intertwined global economy, unpreparedness, belated action, social disconnection and hyper-individualism.

It also provides a striking example of the limitations of current evidence-based models to inform global decision making. These models underestimated the speed and impact of the pandemic, the relevance of local conditions and the lack of knowledge about the healthcare system's capacity to respond.

However, on the other hand, positive responses by people and governments also show that widespread, universal change in human behaviour is possible – at least in the case of an acute global health crisis. What we learn from this may also apply to the ten existential risks to humanity that are now unfolding.

The COVID-19 pandemic thus offers direct experience in how to deal with a catastrophic threat. After the storm, the global and societal landscape will have changed. We cannot resume business as usual and would be wise to prepare for sweeping change.

Denial, Misinformation and Failure to Act Preventively

Faced with constant and growing global evidence of catastrophic droughts, fires, floods, storms and rising seas, people can no longer delude themselves that climate change is not happening. The same applies to all the catastrophic risks.

There is a need to galvanise people everywhere to come together to debate, design and implement innovative strategies to transition to a sustainable world - and to avoid bequeathing an environmental and societal catastrophe to future generations.

The dominant global discourse, economically, politically and academically, has for several decades been captured by excessive optimism – while voices calling for fairness, equity or warning of limits to growth and risks have been largely ignored or suppressed. Part of the

problem is that there is significant (often deliberate and well-funded) misinformation that contradicts the scientific consensus on catastrophic risk. Delusions, carefully implanted, are difficult to correct.

At the heart of the contemporary global malaise is the erosion of trust, the absence of leadership and the inability of those who govern to create a political narrative that reflects the values on which inclusive, compassionate and resilient societies depend.

One thing the ten existential threats have in common is that their solution requires the imposition of measures and some costs *now* in order to secure a *future* benefit. Contemporary politics is bedevilled by the fact that politicians are for the most part unwilling to impose any costs. Those who attempt to campaign for good policy become a target for scare campaigns by their opponents.

Influential members of the political class also show a disdain for scientific knowledge and some are actively hostile to it. This has led to scientific advice being ignored, and scientific investment cut – because it does not suit short-term political agendas or (unfounded) political beliefs. Other sources of expertise, such as an independent and impartial public service, are similarly disdained.

Consequently, there is a systemic failure of governance, involving the undermining of democratic norms, a decline in public trust in science, and disdain for truth in politics. The political culture is failing us: political parties in particular, the media,

the commentariat and the adversarial character of politics.

This is leaving us with systems of governance which are demonstrably incapable of understanding and tackling catastrophic and existential risks – and are devastatingly ill-suited to enabling human survival as the risks begin to play out. There is a need for sweeping political reform, including dealing with narrow, vested interests and the influence they exert over the activities of government.

Milton Friedman said that “Only a crisis - actual or perceived - produces real change. When that crisis occurs, the actions that are taken depend on the ideas that are lying around. That, I believe, is our basic function: to develop alternatives to existing policies, to keep them alive and available until the politically impossible becomes the politically inevitable.”

It is becoming inevitable very quickly and if we do not seize this opportunity, we will have failed in our task.

Summing up the Challenge:

The corona virus pandemic appeared suddenly, without warning and took the whole world by surprise. This shows how swiftly a catastrophic risk can appear and affect everyone, how short-term and blinkered are our horizons, how vulnerable and unprepared we are for threats that can shake or collapse our civilization, even extinguish us as a species.

At present, no government in the world has a plan for meeting *all* these risks, for dealing with them as a total system and for finding the best and safest way out of them.

This lack of preparedness means humanity will continue to be ambushed by unforeseen crises.

What our species does about these ten existential threats in the next few years will determine whether present and future generations face a safe, sustainable and prosperous future or the prospect of collapse and even extinction. It is a choice we all must make, together.

Yet, however grim the threats we face, our message is one of hope. We can turn things around if we can get the right people out in the front, giving the right messages. If we clearly understand the nature and causes of the risks, devise integrated solutions - and take early action to defuse them. The longer the delay, the greater the penalty, both economic and in human lives.

We need to convince our fellow citizens of Earth of the necessity to commit ourselves and every belief system we hold, to *survive and thrive*. We must recruit the best and brightest young humans, not to make arms, but to build the process for surviving and thriving for the whole of humanity.

The next two sections of the Round Table discussion explore pathways we can take in order to meet and overcome catastrophic risks and touch initially on possible solutions to the ten risks discussed at the meeting.

A more detailed review of each individual risk, its potential solutions and the opportunities they offer will be generated in a series of Round Table discussions hosted by the Commission for the Human Future during the coming months.

PART 2: PATHWAYS AHEAD

In this section of the report, the CHF Round Table explored and discussed various pathways which it considered will enable us to solve the catastrophic risks discussed in Part 1. The Challenge.

These, it should be stressed, are not solutions to the risks themselves, but rather, indispensable measures and reforms which we must adopt in order to make the solutions possible and achievable.

An opportunity to rethink society

COVID-19 represents an unprecedented opportunity – unlike any we have ever seen before – to rethink our society, its impact on the planet and on the human future. One immediate response has been an effort to maintain the conventional priority on economics, while ignoring the larger risks that we are currently facing. The systemic character of our problem is not well or widely understood.

The ten catastrophic risks are all part of a system that humans have, generally without intention, created. This means that the risks must be understood and analysed as a complex, interconnected system - not as standalone threats, to be dealt with one by one.

It means they must therefore be solved together, at the same time and in ways that make none of them worse.

This means that many existing systems which we take for granted – our economic

system, our food system, our energy system, our production and waste systems, our governance systems, our communities, our relationship with the Earth's natural systems – must all undergo searching examination and reformation.

Fortunately, the global community is awakening to the fact that we now live in a completely different world to the one we inhabited previously, or thought we did. A world where global crises can arise almost without warning – and where we must drastically revise the way our whole system works. This will require a level of commitment across the global community to the kind of open public discussion that cuts through conventional politics, to tackle the ten catastrophic threats in a way never achieved before.

We need a worldwide discussion of the way forward for all of humanity, a discussion in which everyone can at some level participate, to a world which is peaceful, sustainable, fair, and in which all can thrive. That is the next step.

Political and policy reform

If we are to overcome the threats to civilization and our species, there is a need for sweeping political reform, nationwide and worldwide. It is going to take major pressure from the community to achieve the kinds of changes that are really necessary to defuse the catastrophic threats. What we lack, at present, is any kind of coordinating, unifying spark.

Furthermore, we cannot hope to make progress on the ten existential threats

unless we restore: trust in our political class; greater equity across society; science as a factual basis for policy; the capability of the public service to develop and advise government impartially and the capability and effectiveness of diplomacy. We must also encourage the public to demand long-term solutions to fundamental problems, not just short-term 'fixes'.

While nearly half the world lives in a self-proclaimed 'democracy', fewer than five per cent live in actual democracies. This raises the real question about how democracy is practised in current times. One of the critical issues we face is the lack of agency - the ability to influence government - that most citizens feel when control has become centralised, self-interested or corrupted. Decisions are not being made by and for the people, but for the few. The world needs more effective democracy, not less, and the building and strengthening of democratic institutions. Calling for more agency for people, greater participation and a stronger role in determining their own future will be what unifies humanity most effectively to address the common threats we face.

Our current world economic system encourages us to be competitive individualists whereas, in fact, human beings are by nature highly cooperative – and co-operation will be absolutely essential to our global civilization's long-term survival. Rising inequity is one of the many barriers to a safe human future and must be address in all societies.

The COVID-19 pandemic has demonstrated more co-operation than the world has seen in some time. It has

reinforced the evidence that worldwide co-operation on other threats is possible. There has been a huge mutual aid movement across the world demonstrating the willingness of communities and individuals to come together and support each other in hard times. It was a similar story in the case of the community response to the Australian bushfire crisis or recent typhoon and hurricane crises.

From such apparent disasters we can build towards more democratic, more participatory, more connected models of co-operation and self-governance – ones that, through social media, may span the Earth. We can build a narrative around this practice of democracy and connectedness that is going on right now all around the world and create a different set of social norms which can be embedded in a fresh set of democratic institutions.

Taking advantage of this opportunity, created by the pandemic, to reshape policy thinking worldwide is of the utmost importance. There will come a point when the window for new policymaking will be open and the world will have a chance to consider our longer-term future, the great risks it holds and the great opportunities it offers. In the meantime we need recommendations for action now that are easy to implement, things that government can do immediately and which don't cost a lot of money, but which make our future safer from all the catastrophic threats that surround us.

Diverse voices

To overcome the ten global risks, it is imperative to share solutions which are inclusive of voices outside of science, business, government and the traditional centres of power. This means especially including the voices of women, of youth, of First People the world over, of minorities, the poor and physically isolated. We need to recognise, hear and share, their views, values and solutions. We need to know there are other ways to solve these threats than through political, military or economic conquest.

We need also to consider that catastrophic risks are substantially an outgrowth of western systems of thought and practice – and more diverse views may be needed to overcome them. Therefore, we need to be inclusive of voices not generally seated at the world's decision-making tables, or the evidence base from science. For example, the world may have much to learn from its First Peoples about how to care for the land, the sea and the ecosystems that sustain life, as well as from leading thinkers from non-Western philosophies, beliefs and traditions.

We need to engage far larger numbers of young people in imagining and planning our common future. We particularly need to hear the voices of women at the broader system level. We consider the time for female leadership of humanity is well and truly here, in this era where care and concern for future generations are essential - rather than, nationalism, warfare and competition over dwindling resources.

We need to rebuild fairness and equity in all societies, for these are the means by which we can best persuade people to work together for our common safety and well-being.

Redefining security

In the modern era the term 'security' has come to refer primarily to 'the security of the state' – not the security of the group, community or individual. Yet the mounting catastrophic risks confront the whole of human civilization, all communities and every individual – not merely its 195 separate nations. Humanity has to start thinking about security differently to the way it has been framed historically.

The time is ripe to redefine 'security' to a concept that begins with the personal safety and well-being of all citizens. Unless we move away from the limited conventional definitions of 'national security', we are not going to solve the threats that face us all which will be submerged in national self-interest.

The COVID-19 epidemic is an opportunity to review our ideas of what makes us secure. The conventional notion of national security relies on spending billions of dollars on the military and having 7000 nuclear weapons ready for use at a few minutes' notice. However, society is arguably far more secure when it is cohesive, has governments that listen to their people, a well-functioning democracy and genuine, sincere co-operation with other nations rather than competition, military or economic. After recent catastrophic crises driven by

climate and disease people are more interested in their personal safety and the safety of their loved ones, their parents and their communities. That safety can be enhanced by trust and collaboration around the world.

Furthermore, the concept of security framed as wellbeing, both individual and collective, fits very well within the narrative of the world's 17 *Sustainable Development Goals (SDGs)*. That narrative is truly powerful, not least because every nation in the world has signed up to it. It is a global statement of what humanity considers be the right direction for global security. We must demand its implementation as essential to building a safer world. We can also insist that our political and business leaders adopt the World Business Council for Sustainable Development's *Vision 2050* which maps out the transformative changes necessary to enable over 9 billion people to live well, within the boundaries of the planet. We should be prepared to challenge any changes that national governments may put in place that undermine that vision.

Building natural security

For humanity to survive and thrive we need a natural world that is capable of sustaining not only humans, but all the other species, habitats and ecosystems which support life on our Planet. Our present monetary and economic systems are in conflict with this need – indeed they rely on the over-exploitation of increasingly scarce resources such as water, soil, forests, oceans fish and biodiversity generally.

Our present concepts of 'national security' are also in conflict with a secure future for all and are liable to lead to disastrous wars and refugee crises. The concept of security must be redefined to refer to global security for all and natural security for the systems that give life to the Earth.

There is a need for humanity as a whole to develop more of an eco-centric vision rather than an anthropocentric or econo-centric one. This may include considering the rights of other species to exist, and the right of the natural world to be preserved to look after us all.

Above all, we have to consider the carrying capacity of the Earth and face hard questions like "How many people and domestic animals can the Planet support in the long run without causing dangerous climate change, ecological collapse or a dangerous scarcity of essential resources?" Meanwhile our system must still produce enough food for all people, along with a reasonable and equitable standard of living.

Educating for survival

The Round Table considered that sound education in living healthily and sustainably, within the limits of our planet, will be indispensable to humans surviving and thriving in this, the Century of our greatest risk. Every citizen of Earth must understand their role and their responsibility in making our future safe and our wellbeing secure.

Even before school, preschools can develop in their students a strong emotional attachment to the planet, a

motivation to support its well-being and the beginnings of a scientific understanding about the place of humans as part of an ecosystem. Teachers have the potential to contribute to the future of the planet by developing critical thinking and articulate students, with a deep understanding of the scientific and social knowledge needed to sustain the planet, and to be able to explain and argue for the planet to a range of audiences in different modes.

However, if humans are to survive and thrive, these concepts and their requirements must be built into all levels of the education system, in all countries, and integrated into all subjects studied and taught. This does not call for a major overhaul of the curricula, but rather adjustment to its content so that it educates students about the need for a viable planet to support human life and society, and how to achieve it. This theme needs to run across all subjects taught with the aim of raising a new general of global citizens able to work together to achieve it.

Universities need to develop specific courses and degrees in the *science of surviving and thriving* in a time of catastrophic risk, as well as offering optional course units within traditional subjects such as law, economics, medicine, the arts, the sciences, engineering, architecture, IT, politics and so on.

The cost of action versus inaction

Government are mostly good at assessing immediate or short-term risks – but bad at anticipating and preventing long-term risks. This has to change. We need somehow to institutionalise in government and businesses, processes for understanding and assessing long term risk, planning for and preventing it. This involves a greater respect for scientific evidence and taking full account of the costs of inaction as well as the costs of action.

The climate emergency is a cogent example of a long-term risk that has been neglected – by almost every country in the world – because the costs of preventing it were deemed too high by various governments and corporations, while the costs of its impacts were largely ignored, because they fell chiefly on future generations. There is a need for a persuasive narrative with enough weight, evidence and conviction behind it to build positive action against the ten threats – instead of ignoring them, as was the case with global warming. The new narrative must lay out the risks very clearly – but also constructively, emphasising the benefits and opportunities to be gained from preventing them.

A major mistake in the climate ‘debate’ was not to acknowledge the real risks – because some thought it might frighten people – until it was too late. The consequence of this will be climate impacts far worse than they would have been had the problem been addressed in the 20th Century. Also, the way the economic system has tended to look at climate change has completely distorted

its real impact. Despite numerous warnings from eminent economists, society still does not openly discuss the true costs of inaction. Politics has largely focussed on the cost of action, and often these have been grossly distorted. What we need is a narrative of the bigger picture, which embraces all ten catastrophic threats and their systemic links, clearly identifies the costs of inaction and pinpoints the opportunities, gains and benefits of successful action.

Surviving and thriving

Faced with ten catastrophic and existential threats, it is time for humanity to develop a new science - the *science of human survival and wellbeing*. A holistic approach to human survival requires a new scientific vision, to objectively understand the threats we face and how to solve them all, without making any of them worse.

From now on science funding should be prioritised into disciplines that improve our future prospect of survival by addressing all of the ten threats that have been identified. Currently, many of humanity's brightest minds are being recruited by the arms industry, with explicit government support. An important pathway to a safer future will be to create careers for the best and the brightest human minds in science, technology, engineering, medicine and maths in a new discipline of surviving and thriving.

Out of this will emerge a brand-new industry promoting the survival of the human species. Its members will play a

key role in convincing society, industry and governments that we need a change of direction, towards a safer, more sustainable human future.

The magnitude of these threats will also require improved cognitive and emotional capabilities to address the many causes, symptoms, stakeholders, solutions, dimensions and evolving nature of these challenges. We cannot afford to look at new threats through the lens of old experience. We know that facts and figures by themselves do not shift behaviour. We need to work with psychologists to try and work out how we can best support people in coming to understand, accept and act on these very big issues and to overcome the indifference or aversion responses which are all too common.

We ask humanity to shift from competitive to more collaborative behaviour. We recognise that is a huge shift for some, which will not be achieved easily. Its public communication will be more effective if framed around opportunities for growth, a just transition, family safety and community values – as many successful public health and safety and social marketing campaigns have shown.

Addressing denial will require making desirable behaviours simple, relevant and easy to follow for most humans. To increase the likelihood of behavioural change, people need to have confidence that the new behaviour will be effective in achieving the desired outcome of reducing their risk.

Bringing about the necessary changes in society is not simply a matter of communication. It is also about change management. *Change management* covers every aspect of the risks we face, and the necessary solutions to them. Knowing who the key stakeholders are, what motivates them and what messages they are open to, form part of the essential process of preparing people for positive change. Change management will help to draw pathways and solutions together and engender a less fragmented approach to a safer human future.

Denial and misinformation

A core feature of catastrophic risk is the significant amount of (often deliberate and well-funded) misinformation being circulated that contradicts the factual consensus on what is to be done. This has been especially obvious in the case of climate change but is evident in all categories of risk.

As a consequence, science has become politicised in many countries and on many issues, and overall trust in science has weakened because people confuse the dispassionate, factual advice it offers with political positions.

Understanding of the social, economic and cognitive biases that influence denial and negative campaigning on catastrophic risks is growing rapidly. For example, when scientific information becomes associated with ideological or political positions people are much less likely to evaluate that information rationally. By contrast, exposure to scientific evidence in the absence of political cues facilitates

coherent and rational decision making by the community.

A key part of the challenge, therefore, is how to communicate the science around catastrophic risks in a non-partisan and relevant way. One approach is to explain the challenges that humanity faces in specific and personal terms – how they affect the individual, their daily life, their family and community. It has been shown that, rather than discussing global, national or even city-level risks, one effective method is to undertake hyper-local research that reports on the risks to specific places or neighbourhoods, along with tailored suggestions for how local communities can respond. Another is for scientists to increase efforts in organised outreach which proactively communicate the science of societal risk with the widest possible range of stakeholders.

For the sake of the human future, it is of the highest importance that we increase public understanding of the evidence for catastrophic risk and decrease the volume of misinformation and public deceit released by special interests and their followers. That will involve a huge change in understanding of how wealth is accumulated and how private entities take control over public policy and the national or human interest. Many people are uncertain what to believe about risks or facts about the world in general, and this relates partly to the way information is presented to them and the role of media in presenting that information. We need better ways of getting buy-in from government, business and the community in a very apolitical way.

One effective way to change peoples' minds and behaviour, is for them to learn by doing. That is where democratic practice and deliberative democracy can be extraordinarily powerful. Research shows that the practice of deliberative democracy engenders respect for expertise Rather than focusing strongly on the risks of certain things we need to be communicating to people the benefits of action being taken on them.

We should never forget that humanity is facing an existential emergency. This means that we are going to have to develop unconventional ways of developing the human system as it cannot be solved by clinging to old ways of thought.

PART 3: TOWARDS SOLVING OUR GREATEST RISKS

‘We cannot solve our problems with the same level of thinking that created them’ - Albert Einstein

In our third session the Round Table discussed various solutions that have been proposed for catastrophic risks to civilization. The purpose of the discussion was more to note that practical solutions to all the main risks exist – and are capable of being adopted by humanity – rather than to go exhaustively into the detail of individual solutions.

We noted that all the catastrophic risks are interconnected, and that a solution to any one risk must therefore not make any other risks worse but rather, if possible, reduce the level of risk all round. We consider a systems approach to risk reduction is essential.

More detailed solutions to each of the ten risks identified by the Commission for the Human Future will be discussed and fleshed out at subsequent Round Tables. The aim here is to demonstrate that positive action to make our world a safer place is both possible and desirable, and so to underpin the Commission’s call to the nations of the Earth to develop a universal plan of action to reduce catastrophic risk.

End climate change

There is a powerful international scientific consensus of the necessity to halt and if possible, reverse, human-induced climate change and the related global warming and sea level rise. Unless a global emergency response is implemented to reduce carbon emissions, civilization as we know it will eventually collapse, rendering our ability to address other critical issues academic.

An emergency climate action plan must be adopted globally. The coronavirus experience provides, at a smaller scale, a template for the type of action required, and offers current leadership an opportune moment to abandon the present delay in responding to climate change.

It is strongly urged that countries adopt, at a minimum a 50% CO₂ reduction target by 2030. This is achievable, both economically and technically.

All future fossil fuel developments, of any kind, for any purpose should be prohibited. Existing fossil fuel developments should be phased out by 2040. These actions are in keeping with the Paris target. They are completely achievable and will lower the probability of initiating a catastrophic tipping cascade towards a ‘hothouse Earth’, where all human life is at risk.

There must be an end to all government subsidies and corporate investments in fossil fuel exploration, extraction and processing – and the transfer of these sums, or an even larger amount, into the

development of clean, safe, climate-friendly technologies and products
Federal, state and local governments around the world are urged to

- Phase out coal, oil and gas mining and support a transition to renewable energy generation and export.
- support a just transition for individual workers, businesses and communities
- stimulate large public and private investment in replacement technologies, industries and activities.
- promote employment opportunities in the renewable energy sector.
- invest in carbon sinks and storage, e.g. in agriculture, reforestation.
- assist in making good the losses and damage to poor and developing countries who are the worst affected by climate change; support a transition away from fossil fuels in poor and developing countries; strengthen local adaptation planning for both society and natural ecosystem.
- Properly educate all citizens about the risks of climate change through the media, schooling and community consultation
- Consult widely with communities on the best ways to adapt to the effects of climate change, anticipate and prepare for its worst impacts
- Encourage the whole society to make the best of new opportunities that result from a just transition away from fossil fuels.
- Publicise the costs of inaction compared to the costs of action.

Ban and Eliminate Nuclear Weapons

Nuclear weapons and climate change are the two greatest threats to the future of both civilisation and human occupation of the Earth. Both are not only catastrophic risks but direct threats to human existence. However, they are closely linked to many of the other risks facing humanity, including food and resource security.

The only way to prevent a future nuclear war is to ban all nuclear weapons, forever, and dismantle all stocks relating to them.

To achieve this, it is imperative that all nations sign and ratify the United Nations Treaty on the Prohibition of Nuclear Weapons (TPNW), currently the only global initiative that is heading us towards nuclear weapons abolition.

The widely ratified treaties banning chemical and biological weapons and landmines, provide a consistent standard for all nations to follow: a legal prohibition, the motivation for their elimination and a legal framework to achieve it. The disposal of very large stocks of weapons since the height of the cold war is a promising sign – but with 13000+ nukes remaining, humanity remains far from safe.

The treaty currently has 81 signatures and 36 ratifications. It will enter into force when it is ratified by 50 states. To date the treaty has been opposed or ignored by the world's nine nuclear armed states, the member states of NATO, Japan, Australia and South Korea among others.

Strong pressure by informed citizens on their governments remains the first, best hope of humanity for the banning and disposal of nuclear weapons and the removal of a critical danger to the future of civilization and our species. It is imperative that the legal power to start wars be transferred from party leaders to the whole legislature, in order to reduce the threat and build global confidence while the world disarms.

Repair the Global Environment

There is an urgent need for legislation worldwide to turn around the global habitat destruction and extinction crisis. In places where sound wildlife and environmental laws exist, such as Europe and Scandinavia, progress is being made to reverse some of the damage and bring species back from the brink.

However, in Asia, Africa and South America the destruction is proceeding almost unchecked. In some countries with good laws, such as the United States and Australia, there is a disturbing tendency for governments to backslide on the pretext of 'reducing red tape'. The failure to check climate change and control global poisoning, on the part of governments universally, is also accelerating the destruction of the natural world on which humans rely.

Measures to halt and reverse the destruction of nature by human activity include:

- Universal laws and their enforcement to protect nature,

wildlife and endangered species, on land and in the oceans

- Development of a renewable global food supply based on nutrient recycling, leading to the rewilding of < a third of the Planet, with a target of 'Half Earth' set aside to protect nature
- An end to deforestation globally, and the reforestation of cleared lands
- Plans for sustainable use and recovery of the world's rangelands and savannahs
- Recovery plans especially for keystone endangered species
- Outlawing of poaching, medicinal use and hunting of all threatened species
- Stronger accountability for industry and land holders for environmental damage, combined with stronger incentives to repair ecosystems and maintain stewardship
- Plans to restore the world's degraded soils and replant desert margins
- Plans to end the global water crisis by recycling, reuse, improved water use efficiency, improved water management and control of corruption
- Integrated regional planning which includes species and environmental recovery plans and engagement of local communities and landholders.

End food insecurity

The world food system is increasingly insecure because of:

- The growing scarcity and loss of the soils, water, climate, ecosystem services and other essential resources that support the agriculture-dominated modern food system
- The fragility of global industrial food chains, recently exposed by the corona virus pandemic
- The fact that half the human population lives in cities – and no city on Earth can feed itself, nor are any prepared for an unexpected food shortage or famine.

The solution to these risks lies in developing a Renewable Global Food System³, which involves a thorough rethink of what we eat and how we produce it.

A renewable global food system could consist of:

- (i) Regenerative farming
- (ii) Advanced urban food production and
- (iii) Deep ocean aquaculture.

Such a system would recycle all nutrients, wasting nothing. It would be able to feed everyone and end food scarcity, even in remote and developing regions.

It would release up to 25 million sq km for rewilding and reforestation, thus helping to end the 6th Extinction.

By securing sustenance for everyone, it will remove a principal driver of human conflicts and thus help to prevent most wars, civil and international.

Regenerative agriculture and grazing can also restore the world's soils and farming environment. It can draw carbon out of the atmosphere, to both increase soil fertility, to save water, reduce the effect of drought and help to reverse global warming.

Food is a powerful vehicle for driving and motivating societal change. It is a way of explaining to ordinary people the nature of existential risk, because they understand food and its absence. It is a way of translating catastrophic risk into things that ordinary humans can understand and relate to. Food is therefore an excellent vehicle for getting people to change their consumption habits. Just as we have all changed our behaviour over the coronavirus in the very short space of a couple of weeks, we can change our behaviour over food. We can demand sustainable foods as opposed to unsustainable foods. We can demand healthy foods as opposed to unhealthy foods. The most effective way of influencing governments to support renewable food is through widespread local, national and global public support for a cause.

All-hazard risk assessment

One of the reasons that catastrophic threats continually catch governments and societies unprepared, leading to

³ For details see [Food or War, Cambridge 2019](#).

worse impacts, is the poor level of understanding of risk. For example, many governments prepare for war – but ignore or underestimate the clear and present danger they face from climate change, pandemic disease or food scarcity.

The CHF Round Table considered that governments worldwide need to adopt an all-hazard risk assessment approach. This serves as a foundation for understanding the broad scope of catastrophic risks, the scale of their likely impacts and as a basis for developing policies to prevent or limit them in advance.

Some countries, such as the UK, USA and New Zealand already have all-hazard risk assessment processes, however these are often weighted to perceived national security issues rather than overall human security, leading to the neglect of risks far larger and potentially more disastrous than the historical disputes between nations.

The Round Table felt that not only should all countries adopt the practice of all-hazard risk assessment and preparation but that it should specifically include the ten global catastrophic or existential risks mentioned in this report. This recognises that in the face of such universal risks, no nation can consider itself safe, no matter how well armed or prepared it deems itself.

Human safety, in the final analysis, depends on universal co-operation to understand and reduce risks, around the planet – and nations individually are powerless to achieve this unless they work together in harmony.

Lower human numbers

A fourfold increase in human numbers since the mid-C20th is the underlying driver of all the catastrophic risks we now face, combined with our overconsumption of scarce resources. A key question, therefore, is “How can we slow both population growth and its impact in ways that can enable survival and prosperity for all?”

Limiting the human birth rate voluntarily is surely better than the alternative of a catastrophic dieback or the slaughter of billions of people, and for this reason must now be considered globally, whether people or governments want to or not.

Expert opinion indicates that we can reduce the global population to a sustainable level, over a reasonable period of time, if we can limit average global birth numbers per woman. Lowering the birth rate remains the most humane and equitable way to reduce population growth, although some governments, creeds and individuals still oppose it for their own reasons, often not understanding the risks to their own lives and families which overpopulation creates.

Furthermore, women worldwide have already voluntarily limited their own fertility from 5 babies per woman in 1965 to 2.4 today. This is a tangible expression of global leadership by women, over which men have had little say.

The time has come for the world, and individual countries, religions and cultures to consider in a mature and farsighted way a universal, a longer-term objective

of reducing population growth as it presents a catastrophic risk to all humanity.

It is well understood that lasting reductions in birth rates can be achieved where there are adequate levels of education, healthcare, family planning, female equity and a general improvement in economic conditions.

Implement the Sustainable Development Goals

The [United Nations' seventeen Sustainable Development Goals \(SDGs\)](#) offer a broad and carefully considered road to a safer, more sustainable human future in which catastrophic risks are much reduced.

The SDGs were adopted by 193 nations in 2015, with the aim of substantial implementation no later than 2030. However, their adoption has been uneven, with the highest success coming in northern Europe, Scandinavia, Canada and Oceania - and the poorest rates of adoption in the USA, parts of Latin America, South Asia and Africa.

In 2019, world leaders called for a 'Decade of Action' to deliver on the Goals. This calls for greater leadership, more resources and smarter solutions for the Sustainable Development Goals; local action embedding the needed transitions in the policies, budgets, institutions and regulatory frameworks of governments, cities and local authorities; and people action, including by youth, civil society, the media, the private sector, unions, academia and other stakeholders, to

generate an unstoppable worldwide movement pushing for transformation.

The Commission's Round Table endorsed these objectives, urging greater priority for the Goals at every level of government, business, industry and society, as their combined effect is to help reduce the level of catastrophic risk for everyone.

Clean Up the Earth

All people, and all life, are now exposed to a yearly outpouring of 120-220 billion tonnes of chemically reactive substances, emitted by human activity. This has colossal impact on our own health and wellbeing, the health of waters, soils and the environment and the survival of many species. Humanity now actively produces some 145,000 chemicals, many of them toxic or the cause of cancers and hormonal disruption. These are present in our air, water, food, homes, workplaces and vehicles. Only 21 of these have so far been banned, while an estimated 9 million people die prematurely every year from chemical pollution.

Because of their possible impact on our health and wellbeing, steps must urgently be taken to reduce the quantity, range and mixing of chemicals in the human environment. New and existing chemicals must be rigorously tested thoroughly for health and environmental safety and dangerous ones withdrawn. Because exposure is mostly to mixtures rather than single chemicals, testing of mixtures should also be considered. Since regulation is proving largely ineffective,

global awareness and action by consumers is absolutely critical if this threat is to be reduced.

A ten-point plan to Clean Up the Earth has been proposed, including a new Human Right Not to be Poisoned; the elimination of fossil fuels (as the primary source of most toxins), universal chemical testing; the adoption of zero waste, green chemistry and product stewardship by industry; the education of consumers worldwide in what is safe and unsafe; the introduction of a circular economy.

SUMMARY

With this report of our Round Table discussions the Commission for the Human Future issues an urgent Call to Action to the Nations and People of the Earth to join together in overcoming the ten catastrophic risks which threaten humanity and our civilization.

We identify these risks as:

- Decline of key natural resources and an emerging global resource crisis
- Collapse of ecosystems that support life, and the mass extinction of species
- Human population growth and demand, beyond the Earth's carrying capacity
- Global warming, sea level rise and changes in the Earth's climate affecting all human activity
- Universal pollution by chemicals of the Earth system and all life
- Rising food insecurity and failing nutritional quality
- Nuclear arms and other weapons of mass destruction
- Pandemics of new and untreatable diseases
- Advent of powerful, uncontrollable new technologies
- National and global failure to understand and act preventively on these risks.

These mounting catastrophic risks originate chiefly with the overgrowth in human numbers and, especially, resource demands – which are now breaching the capacity of the Earth to sustain us. They are interconnected and must all be solved

together – not one at a time – and with solutions that make no threat worse.

This means that many existing systems which we take for granted – our economic system, our food system, our energy system, our production and waste systems, our governance systems, our community life and our relationship with the Earth's natural systems – must all undergo searching examination and reform.

Given systemic failure of governance around the world to anticipate and deal with these great risks, a decline in public trust and a disdain for truth in politics and some media, there is a need for sweeping political reform, including new ways to confront corruption by vested interests and the influence they exert over government.

The world needs more effective democracy, not less. This involves greater agency for all people in their own governance, wider participation and a stronger role in determining their own future with a view to unifying humanity to deal with the common threats we all face.

The world needs to move away from conventional definitions of 'national security' and towards new concepts of global natural security and human security that embrace the safety and wellbeing of all Earth's citizens and the natural world that supports them.

To survive and thrive we also need to develop a more eco-centric vision of our future rather than an anthropocentric or econo-centric one, one that fosters a natural world that is capable of sustaining

not only humans, but all the other species, habitats and ecosystems which support life on the Planet.

A core feature of catastrophic risk is the significant amount of (often deliberate and well-funded) misinformation that contradicts the factual consensus on what is to be done. It is of the highest importance that we increase public understanding of the evidence for catastrophic risk and decrease the volume of misinformation and public deceit released by special interests and their followers.

Yet, however grim the threats we face, our message is one of hope.

We *can* turn things around and reduce all these threats if we act together, as humans on the Earth, if we are willing to change our behaviours and adapt to new circumstances and new opportunities. And we can discover fresh opportunities, more satisfying ways of life and fulfilment from overcoming our risks.

For this it is essential that humanity develops a shared understanding of the nature and causes of the risks, that we devise integrated solutions – and that we take early action to defuse them. The longer the delay, the greater the penalty, both economic and in human lives.

Important to this goal is the development of a new science - the science of human survival and wellbeing – and the integration of ‘surviving and thriving’ into educational systems worldwide, so we raise a generation of young people who know how to do both, despite the troubled world they have inherited.

It is essential that all human belief systems, political, religious, monetary and in terms of the narratives we tell ourselves, commit to a shared goal of surviving and thriving. We must recruit the best and brightest young people to build and lead this process. This demands the inclusion of far more voices outside the current centres of power: women, youth, First Peoples, minorities, the poor and physically isolated. The time for female leadership in all spheres is here, in this era where care and concern for future generations is essential - rather than warfare and conflict over dwindling resources.

We will empower everyone, young and old, female and male, poor or affluent to play a part in building a safer, saner human future.

The Commission recognises that the solutions discussed in this first report fall short of all that is needed to overcome the ten catastrophic risks. However, they represent a start in tackling our common threats together and, more importantly, they prove that solutions exist – and that they can offer a brighter, safer future.

Importantly, they demonstrate that there are huge benefits and great opportunities, new industries, jobs and creative lives, to be found in changing the way we do things in favour of our survival.

They show that facing great risks is not merely a question of overcoming our fears – but also of opening our eyes to the many opportunities and advantages which solving them creates.

Humanity has proven time and again in the past million years that it is superbly adapted to survival – and that survival opens us to boundless new horizons, to great achievements, fresh dreams and their fulfilment.

Recommendation:

The Commission for the Human Future calls on the nations and peoples of the Earth to come together, as a matter of urgency, to prepare a plan for humanity to survive and thrive, far into the future.

APPENDICES

Appendix 1 - Contributors to the CHF Roundtable Discussion and Report

Most of the contributors prepared a page of key points for consideration by participants in the Roundtable before the discussion began. Three separate sessions were held by Zoom, each lasting more than 1.5 hours. Each was attended by 30+ of the participants. Each of the three sessions was recorded and the discussion was transcribed and distributed to all participants. This report has been authored for the Commission by an editorial group of five: Professor John Hewson, Dr Arnagretta Hunter, Em Prof Bob Douglas, Mr Julian Cribb and Ms Alison Leigh, who have drawn from the transcripts and key points. Below are listed all those who contributed to the Roundtable key points, discussion or both.

Paul Barratt AO. Former Secretary of two Federal Departments; Defence and Primary Industries and Energy. Former CEO Business Council of Australia. Now Chair, Australia21 and Co-Vice Chair Commission for the Human Future. He is President of Australians for War Powers Reform.

Allen Behm heads the International and Security Affairs program at The Australia Institute following careers in the Australian Public Service and as political advisor to two senior politicians.

Professor Corey Bradshaw, is a Fellow in Global Ecology at Flinders University. He works in applied ecology, biodiversity conservation, human demography, species responses to climate change, disease ecology, and applying ecological theory and modelling techniques to hindcast prehistoric ecosystems.

Professor Colin Butler, Former GP, and Co-Founder of the NGO, BODHI, which works in six Asian countries, to promote development and improve human rights. His prolific research activity is around advancing sustainable global health.

Dr Steven Cork is an ecologist and futurist, who played a lead role in developing the Millennium Ecosystem Assessment Global Scenarios. He is a principal consultant at Ecoinsights, a Director of Australia 21 and has taught environmental policy and communication at the ANU.

Julian Cribb is a science writer and author of four books on Existential Risk. Member of the Board of the Commission for the Human Future.

Dr Geoff Davies is a retired Earth scientist who has for two decades turned his attention to economics and published several books on its role in society.

Mark Dorman holds a Master degree in Environment, specialising in Education and Social Change. He recently hosted a podcast series for Australia21, entitled 'Survival Matters' about engaging youth in the Existential Threats. He is a Board Member of the Commission for the Human Future.

Emeritus Prof Bob Douglas AO is a former ANU Public Health Academic. He is a Director of Australia21 and Secretary of the Commission for the Human Future.

Ian Dunlop is a former fossil fuel company director and former CEO of the Australian Institute of Company Directors. He is also a former Chair Australian Greenhouse Experts Group. Now a Member of The Club of Rome, a Director Australia21 and a senior member of the advisory board of **Breakthrough** National Centre for Climate Restoration.

Hannah Ford is a Final Year student in Development Studies at ANU. She was awarded the ACT Young Environmentalist of the Year Award in recognition of her efforts towards the climate movement and is a Board Member of The Commission for the Human Future.

Professor Sharon Friel is Professor of Health Equity and Director of the Menzies Centre for Health Governance, School of Regulation and Global Governance (RegNet) ANU. She was Director of RegNet from 2014-2019.

Jenny Goldie is a former science teacher and science communicator with CSIRO. She is Vice President of Sustainable Population Australia and President of Climate Action Monaro.

Professor Russell Gruen is Dean of the ANU College of Health and Medicine, a public health trained trauma surgeon with 25 years' experience in the front lines of clinical care management and a Board member of the Commission for the Human Future.

Rachel Hay is a senior Arts-Law student at the University of Tasmania, Rachel has been very active in sustainability, justice, and social and environmental policy groups and is a Board Member of the Commission for the Human Future.

Professor Judith Healy is a Social Scientist, at ANU. Widely published on national health care systems. Shared publications with late husband Prof Tony McMichael. She is Treasurer, Commission for The Human Future.

Professor John Hewson AM is an economist and former politician. He is Chair of the Board of the Commission for the Human Future and a Professor in The Crawford School of Public Policy at ANU.

Tim Hollo is Executive Director of The Green Institute, where he leads thinking around ecological political philosophy and practice, and drives policy discussion around Rights of Nature, Universal Basic Income and participatory democracy. He is a former board director of Greenpeace Australia Pacific.

Professor Mark Howden is Director of the Climate Change Institute at the ANU. He is Vice Chair of the Intergovernmental Panel on Climate Change (IPCC) and a member of the Australian National Climate Science Advisory Committee.

Em Prof Terence Hull is a demographer at ANU. He works on issues of reproduction, population growth, censuses, and mortality in the Asia-Pacific Region.

Dr Arnagretta Hunter is a physician and cardiologist. She is a Board Member of The Commission for the Human Future and is The Human Futures Fellow at the ANU.

Dr Aparna Lal is an early career academic in Population Health at ANU, with a background in wildlife science and a current focus on how the physical environment impacts human health and well-being.

Alison Leigh is a TV producer and Director of an international group celebrating science excellence. She is a Board Member, Commission for The Human Future.

Professor Raina McIntyre heads the Biosecurity Program at the Kirby Institute, UNSW, which conducts research in epidemiology, vaccinology, bioterrorism prevention, mathematical modelling, genetic epidemiology, public health and clinical trials in infectious diseases.

Shirley Pipitone is an independent scholar, interested in the human attributes related to pro-environmental behaviour. She is also The Public Officer of The Commission for the Human Future.

Dr Hugh Possingham is Chief Scientist of The Nature Conservancy best known for his work in conservation biology. He is an ARC Laureate Fellow in the Department of Mathematics and the School of Biological Sciences at the University of Queensland. He is a member of "The Wentworth Group".

Professor Alfred Poulos is a health researcher and has published two books on chemical pollution of foods and the environment.

Dr Vince Polito is a Senior Research Fellow in the Department of Cognitive Science at Macquarie University. His research focuses on belief formation, self-representation and consciousness. He is a convenor of the Macquarie University Wise Cognition Research Group.

Professor John Quiggin is Professor of Economics at University of Queensland. He writes extensively on economics, climate change and the environment.

Dr Lynne Reeder is a Director and former EO Australia21 and in that role she founded the Mindful Futures Network – a network of over 700 across Australia interested in the research and application of mindfulness, empathy and compassion.

Assoc Prof Tillman Ruff AO is a public health and infectious disease physician at The University of Melbourne, Co-President of International Physicians for the Prevention of Nuclear War and co-founder of the International Campaign to Abolish Nuclear Weapons (ICAN).

Professor Luis Salvador-Carulla is Head of the Centre for Mental Health Research and co-lead of the Visual and Decision Analytics Lab at the College of Health and Medicine ANU His Field of Research Is Decision Analytics and Complexity in Health Care.

Rumtin Sepasspour is a public servant who works on foreign policy and national security issues. He has been Visiting Researcher at the Centre for the Study of Existential Risk, at the University of Cambridge He contributed to this discussion in his capacity as Board Member, Commission for the Human Future.

Dr Mark Stafford-Smith, coordinates climate adaptation research in CSIRO in Australia, overseeing an interdisciplinary program of research as well as regularly interacting with national and international policy issues.

Emeritus Prof Will Steffen is the Former Director of the ANU Fenner School, Former EO of IGBP Global Change Program in Stockholm and a current member of the ACT Climate Change Council.

Lyn Stephens is an organisational development consultant. She has worked with The Australian Centre for Dialogue at the ANU. She is a Director and former EO Australia21.

Professor Toby Walsh is Scientia Professor of Artificial Intelligence at UNSW Sydney and CSIRO's Data61. He is a strong advocate for limits to ensure AI is used to improve our lives.

Dr Sue Wareham OAM is a former GP and is President of the Medical Association for Prevention of War and a board member in Australia of ICAN (the International Campaign to Abolish Nuclear Weapons). She is also Secretary of Australians for War Powers Reform.

Appendix 2 - Commission for the Human Future Communique, March 28, 2020

Canberra, March 28, 2020: A group of Australian scientists, business leaders, public servants and academics has called for the world's nations to come together to develop a strategy for human survival.

Recognising mounting catastrophic risks from mismanaged human and environmental systems, under-regulated weapons and the failure of our political processes to address serious challenges like climate change and pandemic disease, the newly formed Commission for the Human Future said it is time for humanity to act together to secure our future.

“The coronavirus pandemic, Australia’s recent bushfire crisis and severe drought highlight how catastrophic risks are building up. Most countries are experiencing similar increases in uncontrolled threats. These are a wake-up call to the whole of humanity that it is time for action,” Commission chairman Professor John Hewson said.

“At our online Roundtable today, we considered ten major catastrophic threats to humanity – and we recognised they are interconnected. This means we must solve them together, not one at a time, and with solutions that make no threat worse. What we are facing now with COVID19 is a dress rehearsal for other threats to come.”

“The group also agreed that many practical solutions exist and can easily be implemented to avoid catastrophic consequences in the years ahead.

“What humans do about catastrophic risks in the next decade will determine whether current and future generations will face serious threats to their survival – or whether we can build a safer, more prosperous and sustainable future.

“The group concluded that solving these risks holds tremendous opportunities for wellbeing, development, stability, peace and renewal for the whole world – and that the benefits to all of acting now as a global community are enormous.”

A full report of the Roundtable discussion will be issued shortly. Contact us for a copy.

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More details on global risks and The Commission: <http://humansforsurvival.org/>

Appendix 3 - Resources on Catastrophic Risk and its Solution

The Commission for the Human Future acknowledges the vital work on global risks by a growing network of august institutions and individuals round the Planet, and their invaluable contribution to our own deliberations.

- Future of Humanity Institute, Oxford University: <https://www.fhi.ox.ac.uk/>
- Cambridge Institute for the Study of Existential Risk: <https://www.cser.ac.uk/>
- The X-risks Institute: <https://www.xrisksinstitute.com/>
- The Millennium Alliance for Humanity and the Biosphere: <http://mahb.stanford.edu/>
- Future Earth: <http://www.futureearth.org/>
- The Geneva Global Initiative: <https://www.genevaglobalinitiative.org/>
- Surviving C21: a blog. <https://juliancribb.blog/>
- Yale e360: <http://e360.yale.edu/>
- 350.org: <https://350.org/>
- Bulletin of the Atomic Scientists/Ploughshares: <https://www.ploughshares.org/issues-analysis>
- Future Directions International: <http://www.futuredirections.org.au/>
- Richard Heinberg: <http://richardheinberg.com/>
- David Suzuki Foundation: <https://david Suzuki.org/>
- Great Transition Initiative: <http://www.inspiringtransition.net/>
- Lethal Heating Blogspot: <http://lethalheating.blogspot.com.au>
- Al Gore: The Climate Reality Project: <https://www.algore.com/project/the-climate-reality-project>
- Leonardo DiCaprio Foundation: <https://www.leonardodicaprio.org/>
- Aesop Institute for Human Survival: <http://www.aesopinstitute.org/human-survival.html>
- UN Global Environment Facility: <https://www.thegef.org/>
- UN Population Division: <http://www.un.org/en/development/desa/population/>
- UN Sustainable Development Goals and 2030 Agenda: <https://sustainabledevelopment.un.org/?menu=1300>

Appendix 4 - About the Commission for the Human Future

The Commission for the Human Future (CHF) is a body of researchers and concerned citizens dedicated to finding and developing solutions to the greatest challenge in human history - the complex of catastrophic global threats that now confront us all.

Its website address is www.humansforsurvival.org

Our goals are:

- To alert Australians and all other humans to the looming planetary crises caused by a group of ten, interlinked, potentially catastrophic threats to the human future, including:
 - Climate change, with global heating, ocean level rise, extreme weather events:
 - Eco-system destruction and loss of biodiversity:
 - Population increase beyond Earth's carrying capacity:
 - Famine and food insecurity:
 - Global pollution by chemicals emitted or created by humans:
 - Weapons of mass destruction including accidental or intentional use of nuclear weapons:
 - Declining availability of natural resources on which society depends:
 - Pandemics of untreatable and preventable diseases:
 - Unregulated expansion of disruptive technologies and artificial intelligence:
 - National and global failure to understand and/or act preventively on these risks.
- 2. To promote a positive narrative for transitioning to sustainable planetary health.
- 3. To partner with governments, researchers, policymakers, industry and civil society in this endeavour.
- 4. To draw on the research available in Australia and internationally for this purpose, including partnering with like-minded national and global institutions.
- 5. To act as a 'knowledge broker' in communicating about threats and solutions.
- 6. To engage in policy dialogue with key players, in order to develop action on threat reduction, mitigation or adaption, that focus on both selected and combined risks.
- 7. To communicate findings in regular, readable reports to decision makers and the world public.
- 8. To develop and monitor a Human Survival Index comprising component risk indicators (climate change, resources, human population, pollution etc.) in order to measure and monitor progress.

Appendix 5 - Become a Supporter of the Commission for the Human Future

To become a supporter of the Commission and its work to build a safer, brighter human future please complete this form and send it to us, together with your subscription/donation.

A Supporter of the Commission is entitled to receive all its public reports and statements and its newsletter, and to share them as widely as possible with their family, friends, work colleagues and other contacts globally.

We seek your support for the objects of the Commission, which are to:

- Alert humanity to the nature and scale of the ten catastrophic risks that face our civilization
- Help to devise integrated solutions to global catastrophic risks
- Identify the fresh opportunities that arise from solving the major threats.
- Encourage global dialogue about the risks, their solution and opportunities.
- Serve as a knowledge hub for the solution of global catastrophic risks

Note: Donations to the work of the Commission are tax deductible within Australia.

Categories of support and subscription:	
Supporter (adult, general)	\$50 a year
Supporter, concessional (e.g. pensioner, retired etc.)	\$20 a year
Youth Supporter (under 25)	Free
Corporate supporter (company, NGO or agency)	\$500 a year

Your scanned application form should be returned to: bobdouglas@netspeed.com.au and your subscription and /or tax deductible donation, should be paid by direct transfer at <http://www.humansforsurvival.org/donate> or sent by cheque to the address shown there.

Application details

I apply to become a registered supporter of the Commission.

Name:

Country of residence:

Email address:

Telephone (optional):

Supporter Category: Adult /Concessional/Youth/Corporate (circle one)

Additional donation to the work of the Commission \$

Amount paid \$

Please add any information about yourself and your qualifications which might assist the Commission in its work.