

HUMANS for SURVIVAL

In The Face Of

Existential Mega-Threats

A discussion paper for a Roundtable of ANU Leaders. Hosted by The ANU Emeritus Faculty to be held in the Mills Room Chancelry Building ANU Tuesday June 27 1pm-4.30 pm

EXECUTIVE SUMMARY

Humans are facing the greatest test in the million-year ascent of our kind. But this isn't a single challenge, like a famine or disease outbreak. It is a constellation of ten huge man-made threats, which are now coming together to imperil our stability and existence. Society often regards these ten risks – ecological collapse, resource depletion, weapons of mass destruction, global warming, global poisoning, food insecurity, population and urban expansion, pandemic disease, dangerous new technologies and self-delusion – as separate issues. In reality, they are deeply intertwined: each affects the others. This means they cannot be dealt with one at a time, but must be addressed in conjunction – and at species level.

Drawing on the latest and best science, the book by Julian Cribb, “Surviving the 21st Century “(Springer 2017) appraises each of those dangers – and also looks at what we need to do, both as a species and as concerned individuals – to avoid them. Anticipating and finding ways to limit mortal danger is what humans have always done best and how we survived through the last million years. Almost certainly we have the technical ability to do so again. However, on the present evidence, our national governments, financial and other social institutions lack the capacity, wisdom and will to solve this compound threat. In many cases, as Sir David Attenborough suggests, they are “in denial” about its sheer scale. Something has to change.

The ANU Emeritus Faculty has established a working group on this topic and is providing the framework for an afternoon roundtable discussion by invited leaders of the ANU student and academic communities as well as a group of experts on existential threat. Although a number of universities are studying these existential threats, no university anywhere, to our knowledge is leading the crosscutting solutions to them. This discussion paper argues that ANU could be the institution that raises the torch and inspires worldwide exploration. It is argued here that Humans for Survival is an initiative that should be owned by the whole University and that it should engage students and teachers, as well as researchers from the entire University community.

Three questions will be put to the roundtable and participants are being invited, in advance of the discussion, to put together their own answers to these questions. 1 What needs to happen to put the human species on a survivable course? 2. What role could ANU play in this? 3. Where are the levers for change? The Roundtable discussion will be conducted according to the Chatham house rule. The proceedings will be audiotaped and transcribed without identifying who says what. It is hoped that the report of this discussion could help to provide a suitable backdrop against which the University will consider its future mission and priorities.

Julian Cribb presented the message of his recent book here on the ABC program, Ockham's Razor
<http://www.abc.net.au/radionational/programs/ockhamsrazor/solving-humanitys-greatest-risk/8583142>

Contents

A constellation of inter-related Existential Mega-Threats	3
Eco-collapse:.....	3
Resource scarcity:.....	3
Weapons of Mass Destruction	3
Climate’s hidden risk:.....	4
The poisoned planet:.....	4
Food security:.....	4
Population growth	5
Pandemic Disease	5
Techno-Risk:.....	5
Human denial of reality:	6
Cross-cutting solutions are needed.....	6
Why are we not responding to these threats?	6
An inappropriate human Narrative?	6
Developments that favor essential transformative change:.....	6
ANU is already an intellectual leader in this domain.	7
The late Emeritus Professor Tony McMichael	7
Emeritus Professor Stephen Boyden	7
Professor Clive Hamilton.....	7
Professor Robert Costanza.....	8
Emeritus Professor Steve Dovers,	8
Dr John Hewson Professor and Chair Tax and Transfer Policy Institute, Crawford School of Public Policy	9
Professor Helen Sullivan, recently appointed Director of The Crawford School of Public Policy.....	9
Emeritus Prof Will Steffen	9
Julian Cribb FTSE	10
High quality early and mid career talent in the field of sustainability.....	10
Global Transformative Change is Urgent and Essential	10
What is missing is the national intellectual leadership to define such a response and see it adopted.	10
Humans for Survival: A University-wide Collaboration	10
Other academic institutions are becoming involved in this challenge.	11
Future Of Humanity Institute Oxford University (FHI)	11
Centre For The Study Of Existential Risk. University Of Cambridge	11
Tyndall Centre.....	11
Future Earth	11
Planetary Health Initiative University Of Sydney.....	11
Human Survival Project, University Of Sydney.....	11
Millennium Alliance For Humanity And Biosphere (Mahb) Stanford University	12
Center For Critical Human Survival Issues, University Of Virginia.....	12
Ihope: The Integrated History And Future Of People On Earth	12
The Earth System Science Partnership (ESSP)	13
The International Human Dimensions Programme On Global Environmental Change (IHDP)	13
The Global Change Institute University Of Queensland	13
The ANU Grand Challenges Scheme	13
Engaging the ANU community in the Grand Challenge of “Humans for Survival”	14
A Roundtable for dialogue about this topic	14
Possible ANU activities	14
How would the ANU Collaboration on Humans for Survival add to what is already going on.....	15
Research Challenges	16
Educational Challenges.....	16
Communication and advocacy Challenges	16
Evaluation Challenges.....	16
Why a Preliminary Roundtable Discussion is needed.....	17
Questions for the Roundtable.....	17
A. What needs to happen to place the human species on a survivable course?.....	17
B. What role could ANU play in contributing to this?.....	17
C. Where are the levers for change	17

A constellation of inter-related Existential Mega-Threats

The end of civilisation and human extinction are distasteful topics. Nobody likes discussing them and many people prefer to ignore them as they go about their daily lives. But ignoring them does not banish the risk – inevitably, it only renders humanity less prepared, our future more perilous. There is no other way to deal with such a complex problem than to face up to it, to understand it thoroughly, and to then take resolute and agreed species-wide action to prevent it. A brief overview of some of these interconnected existential risks follows.

Eco-collapse:

Humans have eliminated more than half the world's large animals in the last 40 years, on land and at sea. Dozens of species are thought to go extinct every day due to human activity. As the world's greatest biologist, E. O. Wilson, warns "We are tearing down the biosphere" – the very thing that supports life on this Planet. Or as young environmentalist Bindi Irwin succinctly puts it "If you keep on pulling one brick after another out of your house, eventually the house falls down."

An approach that is being discussed is to move half the world's food production into cities and recycle both nutrients and water, and then 're-wild' 24 million sq kms (an area the size of North America) under the management of indigenous people and farmers. It is to gradually replace mining with mineral recycling, and cease releasing toxins. Yet answers like these are not yet even being discussed in our social and political discourse.

Resource scarcity:

Not only has the human population quadrupled in the last 100 years, but our personal consumption of resources has grown tenfold. In our lifetime, the average person uses 100,000 tonnes of fresh water, 750 tonnes of soil, 720 tonnes of metals, 5 billion energy units and emits 300 tonnes of greenhouse gas. Key resources are becoming scarce and landscapes worldwide are being ruined to obtain them.

The self-evident answer is to re-use resources on a continual basis. Thanks to technology the 'circular economy' is already feasible and becoming cost effective, while green energy is rapidly replacing fossil fuels. However resistance – by political and vested interests – continues to block innovation.

Weapons of Mass Destruction

The latest models indicate it would only require 50-100 Hiroshima-sized (i.e. small) nuclear bombs to end civilisation in a nuclear winter. World stockpiles currently hold around 15,000 such devices, and the risk of their falling into terrorist hands is growing as nuclear materials are stolen, on average, every ten days (IAEA). A new technology-based arms race is underway among the major powers featuring things like pilotless nuclear drones and artificial intelligence.

Nuclear conflict remains the most likely route by which civilization may be destabilized and terminated. We have already seen conflict spiral out of famines, quarrels over resources, people displacement, and mass migration. Conflict also arises from collective delusions, such as political, religious, monetary and nationalistic ideals. The United Nations has initiated a process to ban all nuclear weapons and their materials, and this is supported by over 100 countries. Regrettably, 35 governments – including Australia's - and the nuclear industry remain opposed.

Climate's hidden risk:

The release of 2.9 trillion tonnes of carbon dioxide into the atmosphere and oceans is predicted to drive the planet into a hot phase of +4-5 degrees Celsius above present temperatures. We have already released 1.9 trillion tonnes of carbon dioxide and are adding 50 billion tonnes a year by burning fossil fuels and clearing land. However, the greatest risk is that, as the planet warms, much of the 5 trillion tonnes of methane that is estimated to be locked in the tundra and seabed will be vented, causing unstoppable 'runaway' warming to 10 degrees or more. Scientists fear this may render the Earth uninhabitable to large life forms.

The only foreseeable way to avert this is to dramatically reduce use of fossil fuels and to revegetate a substantial part of the world's land mass. This can be accelerated by a switch to urban agriculture, carbon farming and landscape restoration – the same approach as has been discussed for ecological collapse. Renewable energy is advancing by leaps and bounds and will soon be in a position to take over from fossils. Governments, however, supported by the 90 big companies who make up the bulk of the fossil fuel industry, are hampering this transition.

The poisoned planet:

Man-made toxins are now ubiquitous across land and ocean ecosystems. The whole of humanity and indeed, all life on Earth, is exposed to 250 billion tonnes of annual chemical emissions from human activity. Toxins are in our food, our water, the air we breathe, the furnishings and materials of our homes, vehicles, schools and workplaces, in wildlife, the oceans, in our bodies and even, now, in our genes. Humanity's chemical emissions are four times larger even than our carbon dioxide emissions. Medical evidence that toxins are damaging human intelligence, gender, reproduction and health is mounting.

There is a logical approach, though not an easy one. It is for consumers worldwide to stop buying toxic goods and foods, and to start rewarding companies, which produce clean, safe products. This requires an act of co-operation and knowledge sharing on a global scale, to cleanse our poisoned planet. Concerned citizens, parents, cancer societies, doctors, environmentalists and others are already uniting, worldwide, to start this process. There must be a new human right: not to be poisoned.

Food security:

World food security is on a knife-edge – for the simple reason that population and economic growth between them will drive a doubling in global food demand by the 2060s – while the world is running out of everything needed to satisfy it by traditional methods: topsoil, freshwater, wild fish, oil and mineral fertiliser. We have already extinguished the climate in which agriculture was born.

Food perfectly illustrates the dilemma humanity faces: to solve the problem using modern high intensity agriculture will only (a) worsen climate change, (b) destroy more land and water, (c) accelerate extinctions, (d) displace a billion small farmers, and (e) undermine human health. In other words, it's a response that makes almost everything far worse.

On the other hand, producing half the world's food in cities, using recycled water and nutrients, by converting agriculture outside the cities to low-intensity carbon eco-agriculture, and rewilding the abandoned lands could be a win-win-win which addresses several of the mega threats.

Population growth

On present indications, growth in the human population is expected to continue until at least the late 2060s before reaching a peak, and then commencing a slow decline. The current mid-range forecast is for 9bn in the 2050s, 10bn in the 2060s and 11 bn in the 2090s, if the upward curve is extended. While many people assume growth is all about the number of babies born, in fact growth nowadays is substantially driven by people living longer lives; this makes it all the harder to control through family planning alone. A number of eminent scientists and defence specialists have argued the world - particularly a hot world of +2-3 degrees -cannot support so many people, especially at the elevated levels of material demand driven by economic growth, without risking serial catastrophes of various kinds.

To avoid this, finding creative ways to restrain population growth and ultimately return the world to a sustainable population is one of the key imperatives of global policy.

Pandemic Disease

The World Health Organisation identifies fourteen major pandemic disease threats to the global population: avian influenza, cholera, emerging diseases (e.g. nodding disease), Hendra virus, pandemic influenza, leptospirosis, meningitis, Nipah virus, plague, Rift Valley fever, SARS, smallpox, tularaemia, haemorrhagic fevers (like the Ebola and Marburg viruses), hepatitis and yellow fever. To these it adds the worldwide emergence of a new wave of drug-resistant organisms, such as tuberculosis, golden staph, streptococcus, salmonella and malaria, which pose a rising hazard to human health not only from the diseases they cause that resist treatment, but also from the accompanying loss of antibiotic protection for surgical procedures, cancer therapies etc. WHO estimates that a quarter of world deaths are now due to infectious disease. While there is presently no known pathogen capable of extinguishing the entire human population, pandemic disease is expected to exacerbate other existential risks including famines, water shortages, climate change, conflicts and refugee crises and augment the toll caused by these. However new pathogens are constantly arising as a result of human interactions with the environment (land clearing eg hantaviruses, Ebola) and other animals (eg HIV, Nipah, MERS, SARS, Avian influenza).

The need for worldwide early warning systems is paramount. So is ongoing attention to infectious disease prevention.

Techno-Risk:

Uncontrolled new technologies like artificial intelligence, killer robotics, biotechnology and universal surveillance also harbour unanticipated threats, as people like Stephen Hawking, Elon Musk and Bill Gates have warned.

The safe control of these ultra-powerful new technologies demands oversight and control by civil society – little of which is yet in place. We must demand that control. The tools to control them do not yet exist. As with fossil fuels and the modern food supply, we are infatuated with the promise of new technologies, rather than cautious about the dangers they bring.

A development to be feared is the universal surveillance of every individual in the whole of society, every day of their life. This has not yet arrived, but within a decade or so quantum computers will deliver the memory and search power to do it. At this point every individual person could be spied upon life-long. Warning voices will be suppressed. Humanity may lose its collective ability to foresee danger and avoid it.

Human denial of reality:

However the greatest challenge may lie, not in the physical threats we face, but in our own minds. Our belief in non-material things like money, politics, religion and the dominant narrative often diverts and weakens our efforts to work together for survival. This has to change. Pope Francis, in his encyclical *Laudato Si*, demonstrated how religion and science can together be re-dedicated to human survival – and it is essential that money, politics and the human narrative are similarly realigned. Otherwise they will sabotage the very actions essential to our continuance.

Cross-cutting solutions are needed

This brief summary of inter-related existential risks illustrates the compound challenges humanity faces during the 21st Century, and the necessity for cross-cutting solutions. The scientific evidence for them cannot be denied by rational people – only ignored. To address these issues will require wisdom, co-operation and technology at a global scale. The opportunity is to devise and test the cross-cutting approaches to the combined risks.

Why are we not responding to these threats?

The scientific consensus around these existential threats is solid. Climate change has been part of the national and international conversation for a number of years but is still being discounted or ignored by the Australian, US and Russian governments. Many thoughtful people, including scientists, have warned we may be entering the endgame in human history, but neither the media nor national politicians recognise the seriousness and imminence of these interrelated threats.

An inappropriate human Narrative?

The narrative that influences human culture everywhere, has been summarized by US author David Korten as the "Sacred money and sacred markets" story. In his book entitled "Change The Story, Change The Future: A Living Economy For A Living Earth, " Korten makes the case for building into society, a new global narrative which he describes as "Sacred Life and Living Earth".

This new story, he thinks, could shift culture from one that is "characterised by selfishness, the absence of meaning, a strong belief in markets and the concentration of institutional power", to a new narrative about humanity. His shorthand summary of this is "Sacred Life and Living Earth". Korten argues that for 30 years, global society has been captured by the sacred money, sacred markets narrative, which lies at the heart of economic neo-liberalism. He says that this story does not serve human need and is exacerbating the existential threats discussed above. Could we replace the "sacred money, sacred markets" narrative with the "living economy for a living earth" story? In his recent book *The Bio-Narrative*, ANU Ecologist Stephen Boyden argues along similar lines for a new cultural narrative.

Developments that favor essential transformative change:

There are several promising developments.

1) The advent of a new human ability to 'think as a species' by sharing knowledge and values through the internet and social media is reshaping, for all time and for the better, our ability to co-operate around the planet.

2) The emergence of women as leaders in all walks of society is changing how humanity thinks about the future: women, as a rule, do not start wars, dig coal, ravage landscapes, empty the oceans, wipe out other species and knowingly poison their offspring. They think about the children and the grand children, and their needs – and they have already made a start on the population threat by reducing the human birth rate worldwide.

3) The growing development and influence of multidisciplinary networks that are building bridges between academia and civil society to develop and implement solutions to the combined existential threats. Later in this document we list some of these activities.

Such developments are essential if civilisation and our species are to survive the 21st Century. We think there is an opportunity for ANU – and Canberra, to play a key role in devising and promoting the cross-cutting solutions that will work across all the great challenges we face. ANU could become a leader in learning and sharing knowledge about solutions in terms that ordinary citizens can understand and use in their lives. It could help to ensure that every plan is resilient to existential shocks: that every individual is involved; that all solutions take a prosperous, sustainable, safe, peaceful and healthy long-term human future as their focal goal. Our task is to do what humans, for a million years or more, have done best: identify threats and find ways to avoid or mitigate them. This is the true meaning of ‘wisdom’ and great universities like ANU should be at its leading edge.

ANU is already an intellectual leader in this domain.

The late Emeritus Professor Tony McMichael

At the time of his death in 2014, McMichael had virtually completed the manuscript of a book entitled “Climate change and the health of nations: famines, fevers and the fate of populations”. The book was recently published by Oxford University Press and it rounds out the lifetime contribution of a Canberran who played a key role in world thinking on these matters for much of the last 25 years. In the final chapter of his book McMichael wrote. *“In the 21st-century, populations around the world face unprecedented but broadly foreseeable changes in climate on a global scale, with impacts compounded by other environmental and demographic pressures. We cannot predict the consequence for human populations but they may be dire – especially if runaway climate change occurs.... Can we find another, safer way forward? Our elaborate primate brain with its unique higher cognition planning capacity enables us, when pushed, to imagine alternative futures and to behave flexibly and seek transformative changes. But other human foibles and frailties intervene. These include the widespread assumption of unlimited economic growth, an instinct to retain current social and cultural structures and the limitations of rapid turnover democratic government.”*

Emeritus Professor Stephen Boyden

has been a world-leading contributor to understanding global ecology and the ongoing dangers of current human behaviour. In his 2016 book “The Bio-narrative: the story of life and hope for the future”, published by ANU press, Boyden writes *“I am rather pessimistic. The maladaptive assumptions of prevailing cultures are deeply ingrained. The notion that economic growth must take precedence over all other considerations and general ignorance of biological and ecological realities do not augur well for the future.”*

Professor Clive Hamilton

is a former ANU academic and founder of The Australia Institute, now at The Charles Sturt University, in Canberra. He has recently published a new book “Defiant Earth.” The following

edited extract recently appeared in The Canberra Times “After 200,000 years of modern humans on a 4.5 billion-year-old Earth, we have arrived at new point in history: the Anthropocene. The change has come upon us with disorienting speed. It is the kind of shift that typically takes two or three or four generations to sink in. Our best scientists tell us insistently that a calamity is unfolding, that the life-support systems of the Earth are being damaged in ways that threaten our survival. Yet in the face of these facts we carry on as usual. Most citizens ignore or downplay the warnings; many of our intellectuals indulge in wishful thinking; and some influential voices declare that nothing at all is happening, that the scientists are deceiving us. Yet the evidence tells us that so powerful have humans become that we have entered this new and dangerous geological epoch, which is defined by the fact that the human imprint on the global environment has now become so large and active that it rivals some of the great forces of nature in its impact on the functioning of the Earth system. This bizarre situation, in which we have become potent enough to change the course of the Earth yet seem unable to regulate ourselves, contradicts every modern belief about the kind of creature the human being is. So for some it is absurd to suggest that humankind could break out of the boundaries of history and inscribe itself as a geological force in deep time. Humans are too puny to change the climate, they insist, so it is outlandish to suggest we could change the geological time scale. Others assign the Earth and its evolution to the divine realm, so that it is not merely impertinence to suggest that humans can overrule the almighty, but blasphemy. Many intellectuals in the social sciences and humanities do not concede that Earth scientists have anything to say that could impinge on their understanding of the world, because the “world” consists only of humans engaging with humans, with nature no more than a passive backdrop to draw on as we please

Professor Robert Costanza

is a Professor and Chair in Public Policy at the Crawford School of Public Policy. Dr. Costanza’s transdisciplinary research integrates the study of humans and the rest of nature to address research, policy and management issues at multiple time and space scales, from small watersheds to the global system. He is co-founder and past-president of the International Society for Ecological Economics, and was chief editor of the society’s journal, Ecological Economics from its inception in 1989 until 2002. He currently serves on the editorial board of ten other international academic journals. He is also founding editor in chief of *Solutions* (www.thesolutionsjournal.org) a unique hybrid academic/popular journal. His specialties include: transdisciplinary integration, systems ecology, ecological economics, landscape ecology, ecological modeling, ecological design, energy analysis, environmental policy, social traps, incentive structures and institutions.

Emeritus Professor Steve Dovers,

said recently at an Emeritus Faculty luncheon: “I recently retired from the Directorship of the Fenner School after eight years and I currently chair the steering committee of Future Earth Australia. Future Earth is a crucial international collaboration. I would like to make a couple of key points. I’ve also been involved for many years with The Australian Council Of Environmental Deans and Directors. These come from 33 universities. There is an enormous amount happening. Future Earth is meant to be pulling this together. But there are so many separate agendas happening. That applies nationally as well as internationally. People want to collaborate and there is money. But, there is a long history of ANU not getting the structure right. There have been a number of things in recent years which have been meant to be collaborative, but they have been taken over by a particular university or part of a university such as ANU, while the other parts won’t play. How one gets better collaboration going without falling into the trap of territoriality is a key issue. My feeling is that this (Survival Agenda) will have to be carried out from a few parts of the ANU. It should not be endorsed from top-down without a number of the key schools being actively engaged. The strength of it is that we rate very highly in this field and that is a strength of the ANU.... When I

think about the hooks within ANU for what is being proposed, my own position is that I am not a structuralist. I don't tend to think that if we have a problem we must create a new structure. Because, usually that doesn't work. I'm asking the question, "What is the actual collaborative process or set of activities that would meet the issue rather than trying to impose a structure which someone will probably want to own. Generally ownership by one school at the ANU means the death of collaboration."

Dr John Hewson Professor and Chair Tax and Transfer Policy Institute, Crawford School of Public Policy

Told the luncheon: "The gap between public understanding and science seems to have widened quite a lot. I am quite concerned about that. Perhaps one of the reasons for this is that they are so often the purveyors of gloom and bad news. In terms of positioning an initiative like this you need to have the positive element, while recognising the magnitude of the threat. The magnitude is real and has to be emphasised. I think there is a positive story about the transformation that is required. There are both challenges and opportunities for this transformation. I have been a long-term advocate of a substantive response to climate change. We tried the doom and gloom argument and it worked for a while. It got exaggerated for a while by some of the principal players and the credibility of the argument began to suffer a bit in short-term political terms. There are great opportunities on the other side in terms of the development of business. We have a cutting-edge opportunity in this country with probably the best sun and wind in the world; along with the available technologies to disseminate and store it and so on. The business opportunities in a world of jobs and growth can be very real. I agree that the challenge is enormous and there is an urgency about it but it is not reflected in the day-to-day politics in this country and in other countries. I think the opportunities on the other side are very real. If a collaboration like this can embrace the magnitude of the challenge and seek to put in place policies that can respond to it at the business, community and government levels, it could be very positive"

Professor Helen Sullivan, recently appointed Director of The Crawford School of Public Policy

said at the same event: "In the short time I've been here it has seemed to me that collaboration is the most effective way to achieve things. I am from the UK where we have many more universities than we do in Australia. There is a tendency for each institution in Australia to fiercely guard its independence.... There are two things. One is the grand challenges and the other is the need for public transformation. It seems to me that there is no grand challenge greater than the one we are talking about here. That seems to me to be the most cross cutting and the most fundamental challenge that we could pick.

Emeritus Prof Will Steffen

Will Steffen has a long history in international global change research, serving from 1998 to 2004 as Executive Director of the International Geosphere-Biosphere Programme (IGBP), based in Stockholm, Sweden, and before that as Executive Officer of IGBP's Global Change and Terrestrial Ecosystems project. Will was the Inaugural Director of the ANU Climate Change Institute, from 2008-2012. Prior to that, he was Director of the ANU Fenner School of Environment and Society. From 2004 to 2011 he served as science adviser to the Australian Government Department of Climate Change. He is currently a Climate Councillor with the Climate Institute, and from 2011 to 2013 was a Climate Commissioner on the Australian Government's Climate Commission; Chair of the Antarctic Science Advisory Committee, Co-Director of the Canberra Urban and Regional Futures (CURF) initiative and Member of the ACT Climate Change.

Julian Cribb FTSE

Is a former ANU visiting lecturer in science communication and a current member of the ANU Emeritus Faculty. His book 'Surviving the 21st Century' accentuates the need to develop cross-cutting solutions to all the scientifically-attested megathreats facing humanity in the Anthropocene, and identifies a number of the solutions to be taken at both global and individual level.

High quality early and mid career talent in the field of sustainability

Underpinning ANU's international high fliers in this broad field are very strong postgraduate programs and early and mid-level academics committed to the broad field of sustainability and public policy.

Global Transformative Change is Urgent and Essential

The seriousness of the combined threats and the completely inadequate action on them by the Australian government and many other governments, demands an urgent response.

What is missing is the national intellectual leadership to define such a response and see it adopted.

The response must come from the community and from the many institutions that make up civil society, especially our universities. Academia cannot manage this process alone but it can play a key role not only in developing the evidence base for change, but in actively collaborating with civil society in developing both the momentum for change and the workable solutions required.

There is an unequalled opportunity for the ANU, its staff and students from all faculties to participate in the development of approaches that ensure human survival through this dangerous century. No issue the university currently deals with is of greater urgency or importance.

Humans for Survival: A University-wide Collaboration

In response, the ANU Emeritus Faculty is exploring the development of a university-wide collaboration on human survival in the face of existential risk. We have concluded that transformative change will not come about from the actions of a single academic Centre of Excellence at one university, but from a broad collaboration across Australian academia that systematically and intentionally engages civil society, other academic institutions, the media and our political leaders in discussions of policy solutions that are based on sound scientific evidence. This evidence needs to come from diverse academic disciplines including earth science, economics, commerce, environmental science, health science, psychology, sociology, history, geography and biology, to name only a few.

We propose that the ANU host a university-wide collaboration on human survival, known as Humans for Survival (H4S) which engages all our schools and faculties and all undergraduate and postgraduate students in developing the solutions that will ensure human survival. The new collaboration will need leadership from the very top of the university and serious commitment from schools and departments across the campus in developing its approach.

Promoting and assisting in the implementation of public policies that effectively address existential risk should be at the heart of the mission of a National University.

As a first step, we propose that ANU host a roundtable discussion of the concept of a university wide collaboration by university leaders and people with special expertise on the topic of existential risk and its solutions.

Other academic institutions are becoming involved in this challenge.

We are not alone. Leading universities around the world are exploring these challenges and there are frameworks developing to assist the global collaboration that will be needed to generate an adequate response. Some of these are listed below:

Future Of Humanity Institute Oxford University (FHI)

FHI is a multidisciplinary research institute at the University of Oxford. Academics at FHI bring the tools of mathematics, philosophy, social sciences, and science to bear on big-picture questions about humanity and its prospects. Director: Professor Nick Bostrom <https://www.fhi.ox.ac.uk/>

Centre For The Study Of Existential Risk. University Of Cambridge

The Centre for the Study of Existential Risk is an interdisciplinary research centre within the University of Cambridge dedicated to the study and mitigation of risks that could lead to human extinction or civilisational collapse. Director: Huw Price, <http://cser.org>

Tyndall Centre

The Tyndall Centre was founded in 2000 to conduct cutting edge, interdisciplinary research, and provide a conduit between scientists and policymakers. Beginning in East Anglia it brings together resources from at least 8 UK universities resources of eight. With nearly 200 members ranging from PhD researchers to Professors, the Tyndall Centre represents a substantial body of the UK's climate change expertise from across the scientific, engineering, social science and economic communities. <http://www.tyndall.ac.uk>

Future Earth

Future Earth is the largest international R&D collaboration focused on long term sustainability solutions for the planet and human societies, supported by a range of leading global institutions. Future Earth is a global research framework that brings the world's researchers together with leading thinkers in business, public administration, the humanities and social sciences and the community to build the cooperation, trust and tools to create long-term solutions to global challenges in which economic, social and environmental values can coexist and thrive. It was initiated five years ago by the International Council for Science (ICSU), and draws together thousands of researchers across hundreds of individual and collaborative research programs; already mobilising over US\$2 billion research funding internationally. Future Earth builds on more than three decades of global environmental change research programmes and carries forward the legacy of DIVERSITAS, the International Geosphere-Biosphere Programme (IGBP) and the International Human Dimensions Programme on Global Environmental Change (IHDP).

Future Earth Australia is hosted in this country by the Australian Academy of Science which has appointed Dr Imran Ahmad as the Director of Future Earth Australia to lead the initiative. ANU Emeritus Prof Steve Dovers chairs the Australian steering group.

<https://www.science.org.au/supporting-science/future-earth-australia>.

Planetary Health Initiative University Of Sydney

Planetary health is a multi-disciplinary field founded very recently on the interconnectedness of human and natural systems. It recognizes that human advancement and economic development impose heavy burdens on natural systems and that global patterns of human production and consumption are unsustainable. Leader: Professor Tony Capon

Human Survival Project, University Of Sydney

University of Sydney also has a Human Survival Project in the Department of Peace and Conflict Studies. The ultimate goal of the Project is to save humanity and all other living and prospective sentient species on the planet (together with the environments and habitats they depend upon)

from nuclear holocaust and its aftermath of civilisational collapse and deadly somatic and environmental effects. The latter effects include both catastrophic climate change (nuclear winter) and world-wide, long-lasting radiation hazards, as well as massive destruction of the atmospheric ozone layer. A most urgent priority is to show the absurdity, the logic-free fantasy of received deterrence theory and nuclear “defence” postures. A specific goal of the project is to undertake and encourage research in neglected areas of nuclear survival concern and help bring about radically new policy settings and weltanschauungen (world view) of peoples, governments and global civil society to cope with the master threat of nuclear war.

Co-Conveners: [Peter King peter.king@sydney.edu.au](mailto:peter.king@sydney.edu.au) and [John Hallam johnhallam2011@yahoo.com.au](mailto:johnhallam2011@yahoo.com.au)

Millennium Alliance For Humanity And Biosphere (Mahb) Stanford University

The goal of the MAHB is to create a platform to help global civil society address the interconnections between the greatest threats to human well-being: failure of ecosystem services, economic inequity, social injustice, hunger, epidemics, toxic chemicals, and loss of security to crime, terrorism and war, especially resource wars (veiled or not), to name a few. There are two arms to the MAHB—a research arm and an action arm. The research arm relies on multi-disciplinary collaboration and scholarly research on critical questions about shifting individual, cultural, and institutional behavior from the current self-destructive patterns to actions that support equity and ecological stability. Here MAHB houses its initiatives to 1) define foresight intelligence and 2) create a compelling and plausible vision for a 2050 headed for sustainability, pathways to that desirable world, and measurements of success. The action or engagement arm comprises the Nodes and Associates that focus on interventions, projects, and initiatives and who use the MAHB to interact, share information, lift individual work to higher visibility and fuel a sense of urgency.

President: Paul Ehrlich, <https://mahb.stanford.edu/welcome/the-mahb-organization/>

Center For Critical Human Survival Issues, University Of Virginia

CCHSI aims at a critical engagement with both local and global human concerns, focusing on specific issues such as environmental degradation and pollution, social injustice and inequality, violence and war, etc. In doing so, the Center actively promotes interdisciplinary scholarly collaboration within and outside of the University of Virginia, at the undergraduate, graduate, faculty and community levels. Director: Professor R. S. Khare <http://www.virginia.edu/cch-surv/CCHSI/>

Ihope: The Integrated History And Future Of People On Earth

The IHOPE initiative is a global network of researchers and research projects with its International Program Office based at the Stockholm Resilience Center, Uppsala University, Arizona State University, Portland State University, and the Australian National University (includes Bob Costanza and Will Steffen). Research linked to IHOPE demonstrates that Earth system changes in the past have been strongly associated with changes in the coupled human– environment system. IHOPE supports integrating knowledge and resources from the biophysical and the social sciences and the humanities to address analytical and interpretive issues associated with coupled human– earth system dynamics. IHOPE will create frameworks that can be used to help achieve the integration of human history and Earth system history. The overarching goal is to produce a rich understanding of the relationships between environmental and human processes over the past millennia. The specific objectives for IHOPE are to identify features of complex social– ecological systems, on local to continental spatial scales, which induce resilience, stress, or collapse in linked systems of humans in nature. IHOPE is now a project of Future Earth. <http://ihopenet.org/>

<http://www.futureearth.org/projects/ihope-integrated-history-and-future-people-earth>

The Earth System Science Partnership (ESSP)

The Earth System Science Partnership (ESSP) was established by the international global environmental change research programs (i.e., DIVERSITAS, IGBP, IHDP and WCRP) to facilitate the study of the Earth system in order to understand how and why it is changing under increasing pressure from anthropogenic transformation, and to explore the implications of these changes for global and regional sustainability. Crucial to this scientific enterprise are interdisciplinary Joint Projects on carbon, food, water and health. All ESSP projects are now covered under Future Earth.

<http://essp.org/>

<http://www.igbp.net/news/news/news/earthsystemsciencepartnershipbeginstransitiontofutureearth.5.19b40be31390c033ede80003788.html>

The International Human Dimensions Programme On Global Environmental Change (IHDP)

IHDP was launched in 1990 by the International Social Science Council as the Human Dimensions Programme. In February 1996, the International Council for Science joined the International Social Science Council as cosponsor of the IHDP, and the Secretariat was moved to Bonn, Germany. IHDP is an international, interdisciplinary, non-governmental science programme dedicated to promoting and coordinating research. Its aims are to describe, analyse and understand the human dimensions of global environmental change. IHDP's programme is designed around its three main objectives of research, capacity building and networking. This research requires collaboration from a wide range of disciplines and studies encompassing the local, regional and global scales. IHDP increasingly works in collaboration with partner international programmes on global environmental change: the International Geosphere–Biosphere Programme (IGBP), the World Climate Research Programme (WCRP), and the International Programme on Biodiversity (DIVERSITAS).

http://www.bonn.de/wirtschaft_wissenschaft_internationales/bonn_international/internationaleorganisationen/03264/index.html?lang=en

The Global Change Institute University Of Queensland

The Global Change Institute (GCI) at The University of Queensland, Australia, is an independent source of innovative research, ideas and advice for addressing the challenges of a changing world. GCI works to address the impacts of climate change, technological innovation and population growth through collaborative research across four key themes:

- Clean Energy
- Food Systems
- Healthy Oceans
- Sustainable Water

Established in 2010, GCI's research activities draw on the expertise and constituent parts of UQ's world-class schools, institutes, faculties and centres. <http://www.gci.uq.edu.au/>

The ANU Grand Challenges Scheme

Humans for Survival (H4S), is a perfect fit for the forthcoming **ANU Grand Challenges scheme**.

We propose that Humans for Survival could:

- Establish an Australian network of interacting nodes of 'survival research';
- Co-ordinate a Year 1 course of undergraduate lectures, tutorials, etc (initially at ANU);

- Develop a significant internet 'presence' (blogs, MOOCs, etc) to disseminate the work of H4S nationally and internationally
- Hold regular H4S ANUEF lectures/discussions.
- Create new interdisciplinary opportunities not being advanced elsewhere
- Tackle pressing social and/or technology problems too complex for a single disciplinary approach
- Attract unusually creative high-risk / high-reward interdisciplinary proposals that might not attract immediate support from more traditional funding mechanisms
- Explore novel sources of funding support including philanthropy , sponsorship and crowd funding.
- Expose the next generation of students and researchers to the benefits of multidisciplinary collaboration
- Create research leadership opportunities for Early Career Researchers and a cross-disciplinary platform for future research funding
- Recognise and reward leadership, research excellence, and collaborative and collegial behaviour.

Engaging the ANU community in the Grand Challenge of “Humans for Survival”

The authors of this document consider there is no higher “Grand Challenge” than rescuing the human species from its currently disastrous trajectory and the foreseeable likelihood of civilisation collapse or even human extinction.

The problem is not a lack of available solutions but a process whereby these problems and their solutions can be examined, tested and accepted into mainstream thinking and policy development. This, we suggest, is the challenge that ANU should address as a whole institution. Not only does the challenge apply to all staff and students at ANU and their families, but it also raises fundamental questions for many academic disciplines – for example, how do we create a prosperous economy that sustains human society, rather than endangering it? How can we be sure that the solutions adopted will succeed in all ten areas of risk, not just in one or two?

We see an opportunity for ANU to lead in making every Canberran and every Australian “survival literate”. By that we mean helping everyone understand the nature of the threats we face and the ways they prevent them in their own lives, and as members of society. We suggest that ANU take on the leadership mantle of informing all Australians, including policymakers and industry leaders, what they must do in their lives and work to secure the future.

A Roundtable for dialogue about this topic

For this to happen, the issues presented in this discussion paper need to be explored by the leadership of the University and by the leadership of its student bodies. Accordingly, we propose a half day roundtable of up tot 50 invited leaders to engage in constructive dialogue about the institution's future role in this field.

Possible ANU activities

We suggest that participants in the roundtable might consider the following suggestions:

1. That ANU accepts as part of its national mission the creation of a nationwide collaboration on “Humans for Survival” in developing cross-cutting solutions to existential threats.
2. That ANU establish a cross-disciplinary working group to develop the framework for an urgent and integrated national policy response to all of the 10 existential threats.

3. That existential survival issues be taught, in one or two introductory lectures, as a part of all ANU undergraduate courses.
4. That an undergraduate course be developed in survival literacy that will be taught by a cross disciplinary group and offered to undergraduate students enrolled in all disciplines.
5. That ANU develop a journal of Human Survival to promulgate the findings, achievements and results of its own and its partners research into solution for existential risk. NB such a journal already exists <https://www.thesolutionsjournal.com/>
6. That the group develop a mechanism for promoting survival literacy through educational institutions across the nation.
7. That early in its life the ANU initiative form partnerships other Australian initiatives and institutions in this area, especially with Future Earth Australia, other Universities and the Learned Academies
8. That ANU take active steps to inform the public and policy debate about existential risk and ways to solve it via direct briefing of governments and industry, via the media and social media.

How would the ANU Collaboration on Humans for Survival add to what is already going on

As the material in this paper shows, both in Australia and internationally, there is a serious academic endeavour underway to better understand the dimensions of existential risk and ways to counter it.

However, we are unaware of any university, anywhere, which has made the kind of commitment that we are proposing: one, which cuts across and embraces all disciplines, and engages the collective wisdom of the university as a whole.

Also, we are not aware of any institution exploring cross-cutting solutions to the ten greatest existential risks, nor their development and implementation locally, nationally and globally through a process of adaptive learning.

The parlous state of public policy in these areas attests to the need for a quantum shift, which we think ANU could help to bring about both in Australia and internationally. But we also emphasise that this must be a collaborative exercise in which ANU uses its unique resources to empower and embolden others in academia, civil society and government to develop the transformative changes that are required.

The starting point for the ANU collaboration would be for ANU to appoint a cross-disciplinary leadership group and establish objectives and governance. It will also need to develop a series of timed targets. As a start, we advocate a five-year programme of education, research and advocacy, as well as a serious effort to evaluate the impact of the programme.

We anticipate that at the end of the five-year programme Australia will be well advanced in the development of an integrated approach to human survival and will be playing an active role in facilitating such a development in various international bodies and with partner countries.

While much of the basic science around the nature of existential risk is reasonably well settled, the development of workable cross-cutting solutions for inclusion in public policy and the adoption of these solutions by the community and the political institutions in Australia and other parts of the world, leaves a gap that is crying out to be filled.

All of the ten intersecting existential risks are interacting, and all must be addressed under complex systems science, as part of a “Humans for Survival” initiative. Policy solutions to all 10 threats need to evolve progressively in tandem with each other, be widely discussed and understood in the community and be shared across the planet. Each of these threats offers rich research potential and requires new thinking about education and communication. There are ample opportunities for early and mid-career researchers that offer the promise of huge long-term social benefits. And as an institution, we think it appropriate for ANU to be active in promoting responses to the research, education, communication and evaluation challenges which are subsets of the Humans for Survival challenge.

Research Challenges.

Each of the 10 existential risks will require interdisciplinary research teams to document what we already know, what is happening in other institutions, explore the validity of proposed solutions and test them against what is currently happening. Further research will be required into the interaction of proposed solutions with the constellation of problems. It is not at all difficult to envisage 200 doctoral theses and thousands of highly sought publications emerging from these challenges. The teams working on individual existentialists threats need to be in close communication with other teams.

Educational Challenges

The educational challenge extends well beyond the survival literacy of ANU graduates. The collaboration should set itself the task of developing educational packages for primary school, high school and college students that will help to engage teachers across the education system in Australia, as well as parents and community leaders

Communication and advocacy Challenges

Universities have been customarily wary of advocacy. But communication of the challenges and their evolving solutions will be a fundamental responsibility for those who are working on the solutions. A separate task force should be developed within the University to manage the communication of these solutions to government, the media, industry and civil society. It is imperative that all these sectors be engaged and involved in the task of threat-solving, rather than handed ready-made ‘academic’ solutions that they may not own.

Evaluation Challenges

Measurement of the impact of each solution will be critical to survival of the initiative itself. The evaluation task will require a committed academic team who can document baseline status of each of the existential risks and measure progress in community understanding and political acceptance of the survival challenge.

Julian Cribb has proposed a simple 10-point index for measuring humanity’s prospects of survival, capable of being understood and communicated worldwide. ANU could develop the academic basis for such an index.

Why a Preliminary Roundtable Discussion is needed

This proposal grew out of a series of discussions among Emeritus Faculty members who have deep experience and commitment to the future of ANU. As retirees, we have the luxury to contemplate the state of the world and its future.

We think that what we are proposing in this paper is both necessary and practicable but we also recognise the need for a reality check by those who have followed us into the academic field.

In the first instance, we suggest that the ideas proposed in this paper should be tested by a multidisciplinary group of current University leaders, as well as undergraduate and postgraduate students.

We are suggesting a process whereby a 3 1/2 hour roundtable that is preceded by distribution of participant responses to this discussion paper will provide a valuable test of the practicability of what is being proposed here.

Accordingly, we conclude with a series of three questions, which we invite all participants in the roundtable discussion to consider carefully and provide brief dot-point responses.

Questions for the Roundtable

- A. What needs to happen to place the human species on a survivable course?**
- B. What role could ANU play in contributing to this?**
- C. Where are the levers for change**