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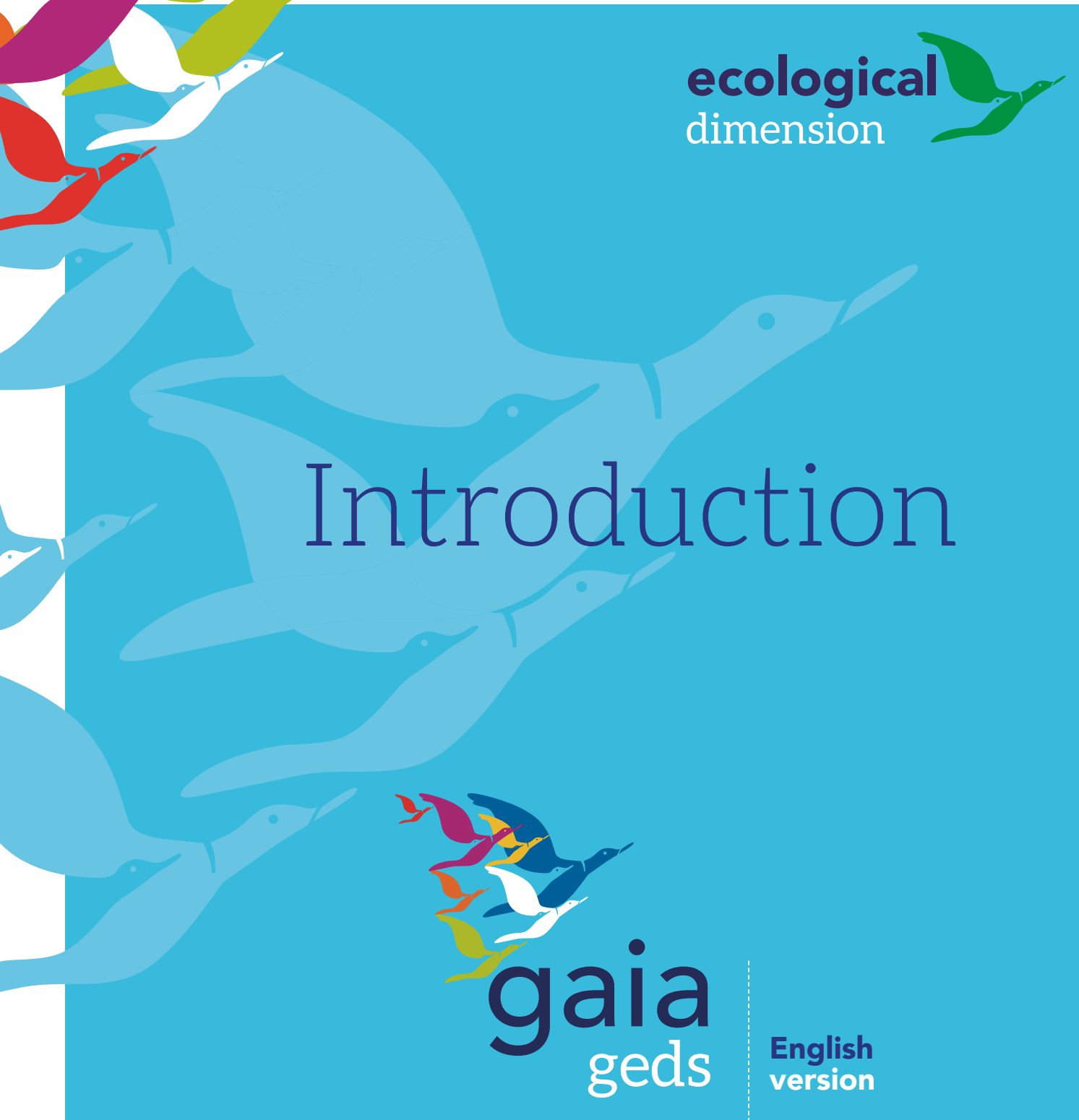
Design for Sustainability



ecological
dimension



Introduction



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English
version



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1.

Welcome to the Anthropocene

“No generation has ever faced a more daunting agenda than those who will become adults in this decade and the next. They will have to do what we, the present generation, have been unable or unwilling to do: stabilize world population, reduce the emission of greenhouse gases that threaten to change the climate – perhaps disastrously, protect biological diversity now declining at an estimated 100–200 species per day, reverse the destruction of rainforests (both tropical and temperate), and conserve soils being eroded at a fast rate. They must learn how to use energy and materials efficiently. They must learn how to use solar energy.

They must rebuild the economy in order to eliminate waste and pollution. They must learn how to conserve resources for the long-term, end the consumerism mentality and eliminate waste. They must begin the great work of repairing, as much as possible the damage done to the earth in the past 200 years of industrialization. And they must do all of this while reducing poverty and egregious social inequities. No generation has ever faced a more daunting challenge.

In one way or another those challenges will require that we learn how to work with and within the biogeochemical cycles and life processes of the earth. The industrial mind aims to use technology to reshape the biosphere. A better approach would be to design our economies, cities, agriculture, forestry, transportation systems, technologies, and culture to fit ecological patterns and processes. To do so requires a science of ecological design that runs counter to the discipline-centric worldview and core commitments of the contemporary university and the reductionistic logic of much of contemporary science.”

*With acknowledgement to **Dr John Todd** and **Dr David Orr** for their paper on Ecological Design Arts.*

“The world will no longer be divided by the ideologies of “left” and “right”, but by those who accept ecological limits and those who don’t.”

Wolfgang Sachs, Wuppertal Institute for Climate, Environment and Energy, Germany

The Anthropocene is the proposed new epoch dating from the impact of humans on the Earth’s geology, ecosystems and climate that replaces the relatively stable Holocene epoch. Various start dates have been suggested dating from the beginning of settled agriculture some 10,000 – 12,000 years ago, the onset of the Industrial Revolution around 1750 or the Great Acceleration commencing in the 1960s. Human impact on the biosphere is now so great that researchers have identified a set of ‘tipping points’ we are in imminent danger of passing. While the overall resilience of

the planetary system has managed to buffer prolonged and incremental changes caused by rising numbers of human beings consuming ever more resources unsustainably, once planetary boundaries are transgressed we are in the ‘danger zone’ of triggering large scale and catastrophic changes that occur when the converging crises start to interact and create run-away systemic breakdown or transformation.

With the Earth systems stretched to the limits, even small human-induced changes can now

“We do not see what we devalue and destroy is part of ourselves. We do not see that we aren’t merely conditionally dependent on the oceans, rainforests, and every living system on Earth for survival; that something more important than survival is at stake. It is our humanity. It is our full beingness. Love benumbed, we believe we can inflict damage without suffering damage ourselves.”

Charles Eisenstein, *Climate: A New Story*

run the danger of pushing these vital functions of the planetary life support system over the edge causing partial or complete breakdown. Professor Will Steffen and a team of scientists at the Stockholm Resilience Centre have

ocean ‘dead zones’. We will be addressing these issues and a transition to regenerative agriculture that restores habitats and biochemical flows while sequestering carbon in the living soil in module 3.

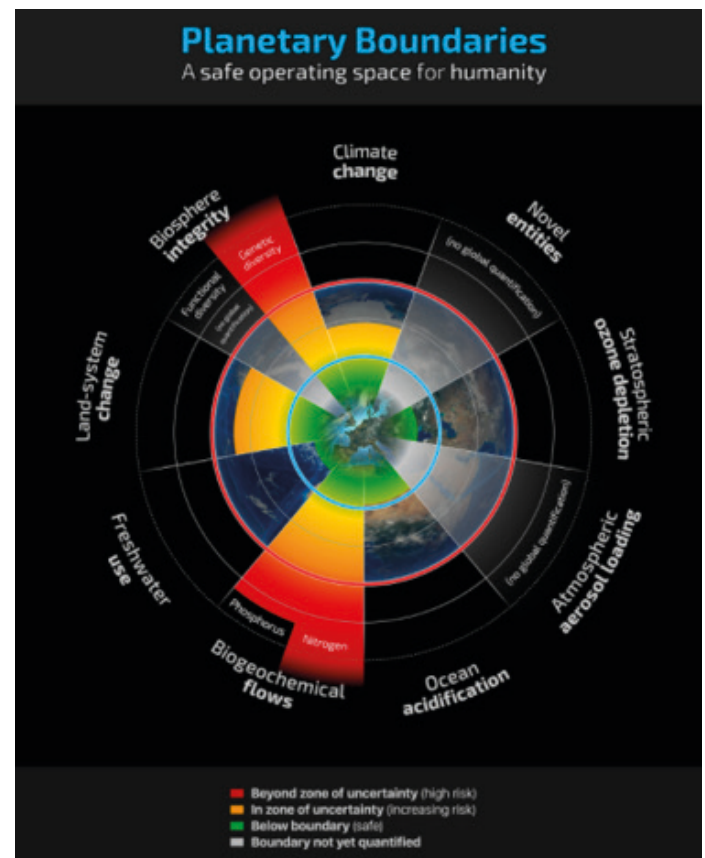


Watch the “Welcome to the Anthropocene” [video here](#)

reviewed the current state of affairs with regard to humanity’s safe operating space and the planetary boundaries we have already transgressed (2009 and 2015).

We can clearly see that loss of biological diversity and the increase in biogeochemical flows are in a higher risk zone than climate change, but this doesn’t mean they are not closely connected. The IPBES (the panel of researchers reporting to the UN Framework Convention on Biodiversity Loss) show that terrestrial biodiversity loss is primarily due to loss of habitat from specialised industrial agriculture and urbanisation, along with deforestation and desertification (land system change). The biochemical flows (nitrogen and phosphorus) are also due to inappropriate use of fertilisers in productivist farming. These in turn are responsible for freshwater and

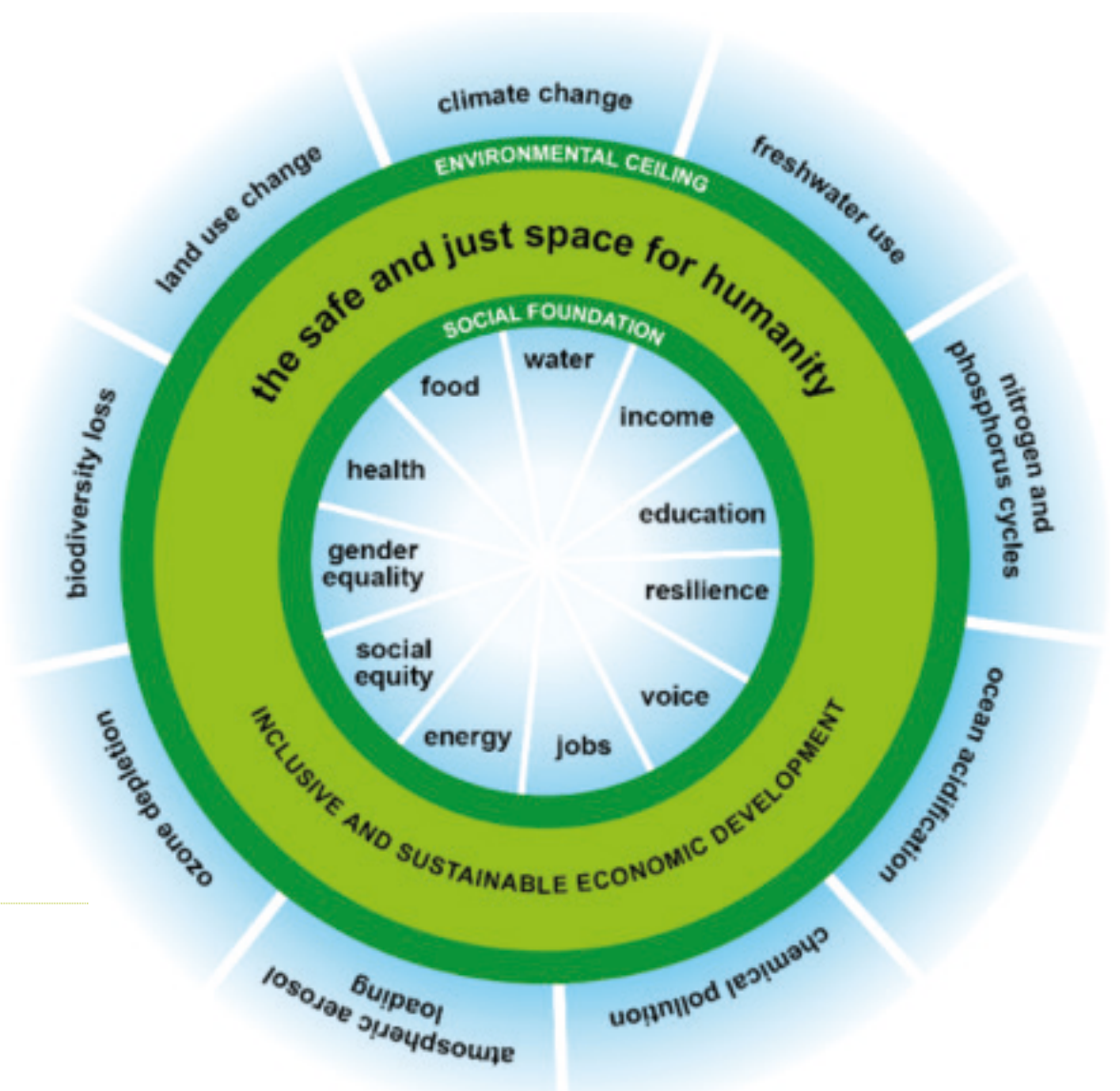
In the run-up to Rio+20, Oxfam pointed out that as well as ecological boundaries we were also transgressing important boundaries of social justice and equity, calling for a ‘Safe and Just Space for Humanity’. Poverty also drives environmental degradation as impoverished communities are thrown back on the unsustainable use of resources for survival.



Source: Johan Rockström, Stockholm Resilience Centre



[Here is a short film](#) (4min) with economist Kate Raworth explaining both the ecological and social boundaries to which we have to pay more attention, now known as Doughnut Economics.



The doughnut:
a safe and just
space for humanity
Source: Oxfam/
Grow Observatory

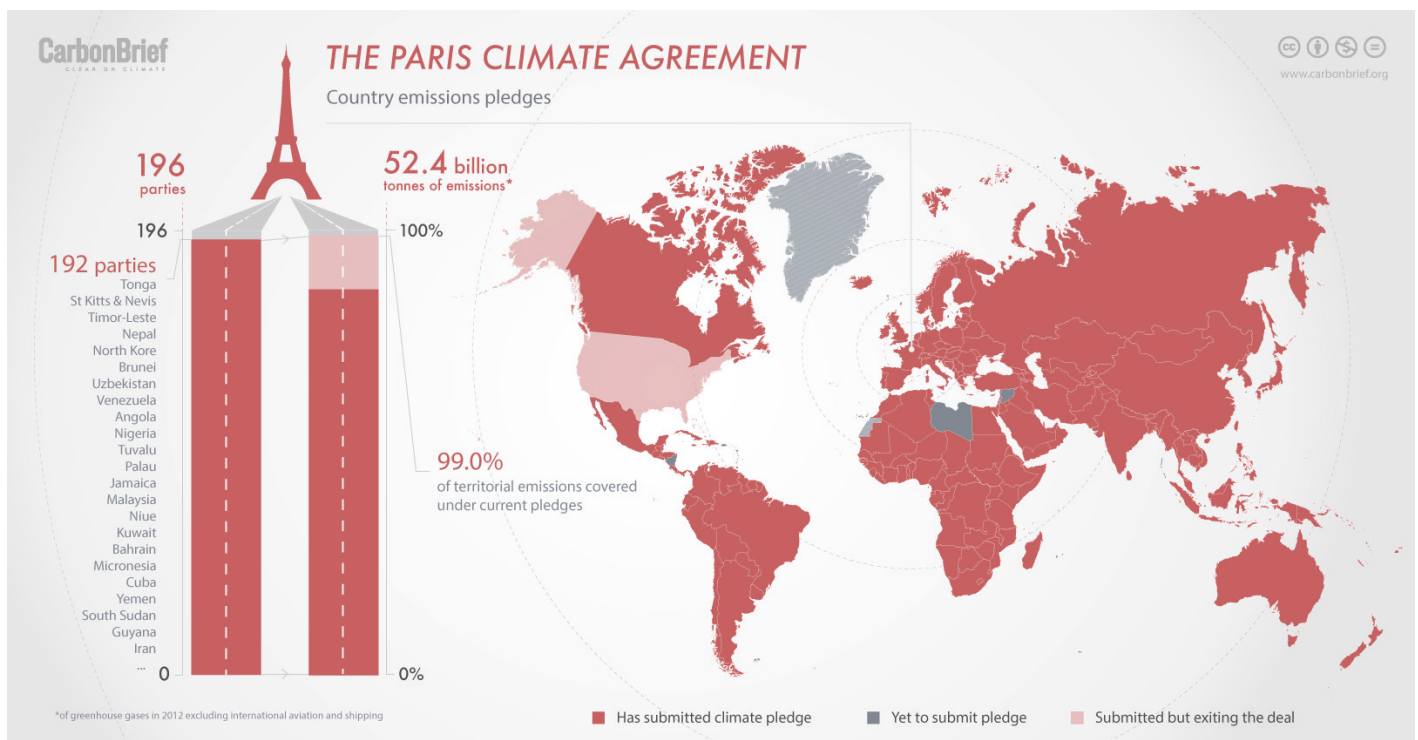
2.

A Systemic Crisis Requires a Systemic Approach

It is now clear that the world is in a state of ecological crisis. It is a systemic crisis with Biodiversity Loss, Desertification and Climate Change (the three UN Framework Conventions that emerged from the Rio Earth Summit in 1992) as the biggest challenges humanity has ever faced. As we move out of the Holocene's relatively stable climate regime, further land degradation and greenhouse gas emissions

will impede the biosphere's ability to regulate the Earth's functional systems, compromising access to essential resources such as water and food. Erratic and disruptive weather events and ecosystem collapse will result in a severe deterioration in human and planetary wellbeing.

In December 2015, the UN Climate Change



Infographic: Who has pledged an INDC so far, and what percentage of the world's emissions are covered.

Credit: Rosamund Pearce, Carbon Brief, based on EU data. Only UN parties have been included in the emissions total. Greenland is an autonomous territory of Denmark, not covered by the EU's INDC. It is not a UN party. Taiwan is also not a UN party. **Source:** Carbonbrief.org

Conference of Parties (COP21) succeed in arriving at the Paris Agreement to limit global warming to 2 degrees centigrade and to aim for 1.5 degrees if possible. The Parties agreed to submit National Determined Commitments (NDCs) to reduce their emissions of carbon dioxide and instructed the Inter-governmental Panel on Climate Change (IPCC) to draw up reports on the most appropriate pathways to achieve these objectives. The Paris Agreement and the latest IPCC reports will be discussed in more detail later. You can check to see what your government has pledged by following the link below.

Also in 2015, the United Nations agreed to implement 17 Sustainable Development Goals to replace the Millenium Development goals and the Agenda 21 that emerged from the Rio Earth Summit in 1992. The 2030 Agenda for Sustainable Development recognises that ending poverty and other deprivations must

go hand-in-hand with strategies that improve health and education, reduce inequality, while tackling climate change, biodiversity loss and desertification. If you want to check on your country's commitment to the Agenda, you can click on the link below.

<https://sustainabledevelopment.un.org/memberstates>

The most encouraging development to date lies in the UN Decade of Ecosystem Restoration (2021-2030). Along with the IPCCs Climate Change and Land Report (August 2019), which recognised the role played by degradation of terrestrial ecosystems in greenhouse gas emissions, as well as the capacity for combatting climate change through ecosystem restoration, this heralds a major step forward, bringing together the three UN Framework Conventions (Biodiversity Loss, Desertification and Climate Change) to promote systemic solutions to our global ecological crisis.

SUSTAINABLE DEVELOPMENT GOALS



Source: sustainabledevelopment.un.org

Our biosphere crisis is now energising large-scale social movements. Young people are deeply concerned about the future and equally deeply committed to change. Larger numbers of people of all ages aspire to live within the social and planetary boundaries, building resilience within intentional communities and co-housing projects, regenerating urban and rural areas, reconnecting to the web of life and healing ourselves and the Earth in the process.

These initiatives lead by example and will galvanise others to follow. The awareness, knowledge, tools and methodologies Gaia Education's courses offer, hope to inform, enable, and inspire you to become an active agent for change, to make lifestyle choices fully integrated into regenerative cultures. While choosing to live within the social and ecological boundaries, we can do so in ways that work with nature to regenerate ecosystems and bring the Earth's dysfunctional cycles back into dynamic equilibrium.



[Watch this video](#) by filmmaker and ecologist John D. Liu of the Ecosystem Restoration Camp movement as he explains the need for the paradigm shift in focus that puts the biotic components of the Earth's systems at the forefront of a holistic approach.

The Paradigm Shift leading to Survival and Sustainability | John D. Liu | TEDxWageningenUniversity

3.

The Regenerative Design Revolution

“Ecological concerns are fundamental to the design and development of ecovillages and sustainable communities. The prefix ‘eco’ originally meant ‘home’ – not in the limited sense of ‘house,’ but rather referring to the surrounding and supporting local environment. An ecological village, then, is integrated into the landscape in a way that benefits both humans and their encompassing environs. Designers will take great care to ensure that life-supporting natural functions are not only preserved but enhanced whenever possible. The strategy here is one of working with Nature rather than against Nature. The ultimate goal of sustainable settlement design is the creation of self-reliant, self-maintaining, self-regenerating ‘living systems’ that can assume a life of their own.”

Chris Mare, 2005 (Gaia Education’s EDE Curriculum)

To realise the “great turning”, the awareness, skills and ecological knowledge to co-create diverse regenerative cultures everywhere, will require a fundamental rethinking of the ways in which societies sustain themselves. In the words of R. Buckminster Fuller “it will require a design revolution.” We now have clear evidence that it is technologically and socially possible to reduce the negative human footprint on the Earth.

We know how to do this, or at least where to start. To accomplish this task will require a new way of thinking and designing, one that implies a different attitude to the planetary resources, coupled with a commitment to recycling, conservation, regeneration and the use of renewable sources of

energy and raw materials. Listen to this talk by ecological design pioneer, John Todd about partnering with nature to create small-scale, local and circular industrial ecologies, new (ecological) economics, biophilic architecture and agriculture that can reduce our impact on the biosphere by 90%.



[Watch this video](#) by John Todd - The Ecological Design Revolution: Bioneers.

The contents of the Ecological Dimension aims to provide participants with the awareness, ecological knowledge and understanding necessary to begin the lifelong journey of regeneration through ecological design. It is organised into interconnected topics as follows:

Module 1 – Whole Systems Approach to Ecological Design

Module 2 – Appropriate Technology: Water

Module 3 – Local Food

Module 4 – Appropriate Technology: Energy

Module 5 – Green Building and Retrofitting

Activity:

Part I) If you haven't done it yet, go to the first forum "Participants Introductions" and introduce yourself:

- **Why** are you taking this course?
- **How** would you rate your own understanding of ecosystems?
- **What** are the different approaches of ecological design you are familiar with, if any? If you are not familiar with one (or more), which ones are you attracted to and why?
- **Share** anything else you would like others to know about you

Part II) Start thinking on the areas of interest you would like to tackle. This course requires that you create a design or prototype based on one of the design approaches and/or one of the systems studied in this course: water, energy, building and structures, food or any of the missing systems: communications,

transportation, disaster recovery, waste and urban regeneration. There may be an area you are already working on, or one that is closer to your heart, your expertise or your ability to work on. Start writing down some ideas as this will help you to match with others whose ideas or interests are similar.