

DESIGN

Regenerative
Worldview

RAMBOLL

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Future of sustainability is in **Regenerative Design**, in systems thinking and in creating ecological civilizations



The story of our journey in the past 300 years has been one of separation from the natural environment and from the natural workings of the food chain. Our built environment has been developed at a rapid pace and in contrast to the natural environment. The resulting impact has been one that has caused tremendous amount of damage to the planet, its ecology and biodiversity, as well as to the definition of justice; both inter-homo-sapien and inter-species.

We are probably the first generation of humans who live at the intersection of a viable past and a collapsing future. In this context issues of justice, design and resilience hold key and determining positions in the way they help us change this course towards a future that flourishes and supports us and the environment which we influence; the change is from a “quasi-sustainable” past to a “regenerative” future.

Environmental resilience, social resilience and intellectual resilience are issues that we rightly apply a lot of our attention and energy to.

Architects, engineers and other design professionals in our industry are no longer busying themselves with the outdated mantras of “client centricity” and “decarbonization”, per se, but are continuously innovating on the curve of “climate centricity” and “regenerative design”.

Kampung Admiralty, by Woha Architects, is a successful example of Regenerative Design on many levels. It promotes environmental, social, biodiversity, and other regeneration, all wrapped into one mixed-development.

Regenerative Worldview

Regenerative Design is a sub-section to Regenerative Thinking, which in turn is part of Regenerative Worldview. In this new paradigm, new language, culture, and value system evolve.

Ecosystem of a Regenerative Worldview





The First Nordic Swan Ecolabel Primary School in Denmark
In collaboration with SKALA Architects, BO-HUS, ETN Arkitekter, Autens and MOE, Henning Larsen and Ramboll have won the competition for a new school in Sundby on Lolland-Falster. With the awarding of the Nordic Swan Ecolabel, the school ensures both a healthy and productive learning environment for all its students.

The New School has been awarded the Nordic Swan Ecolabel, making it the first Primary School in Denmark to achieve this status. The label is awarded based on a variety of environmental considerations that include both sustainability factors such as low-emissions, energy consumption, and waste as well as other health factors such as ventilation, daylight, noise, and chemical exposure.

Project visualisation from Henning Larsen

Regenerative Design

Regenerative design and thinking are predicated on the fact that a “degeneration” has taken place. This is particularly in relation to environmental degradation, and especially since the advent of the industrial revolution over the past 200 years.

The regeneration process is one that goes back to a state prior to degeneration, and attempts to bring about that state into the future. The contrast with sustainable design is that sustainability is founded on 2 flawed premises: one is that the natural environment is a “resource” that we have unfettered access to. The other that we ought to use these natural resources in a measured and controlled manner such that we leave enough for the future generations to continue to use same.

In effect our sustainability efforts have been limited to “being less bad, and doing less harm” to the natural environment.

In contrast, Regenerative Design is based on “doing more good to help heal the damage” hitherto inflicted on the natural environment.

It’s about fusion of the positive attributes of the past with those of the future. It’s about developing now and in the future in total congruency with the ecological civilization of any site. It is about developing without destroying.

Regenerative Design is not about destroying but leaving enough for the future generations to also destroy, but is an attitude which puts an end to sustainability’s vicious circle of destruction.

Regenerative Worldview, from which regenerative thinking and design stem, is a system of thinking with a varied and wide ecosystem of ideas and thoughts which fuse the interrogative and skepticism of science and knowledge, with the wisdom and insight of nature.

Ecology

Regenerative Design is about ecology, and ecology is about a multitude of key environmental and other drivers.

Key amongst these are:

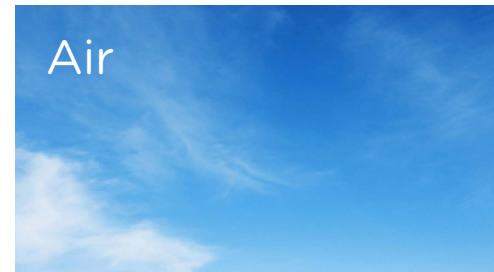
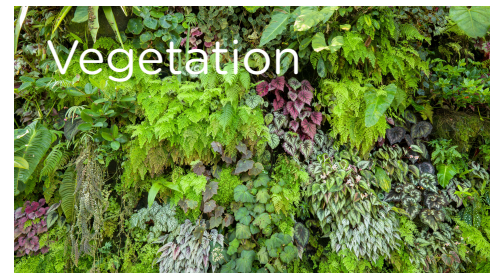
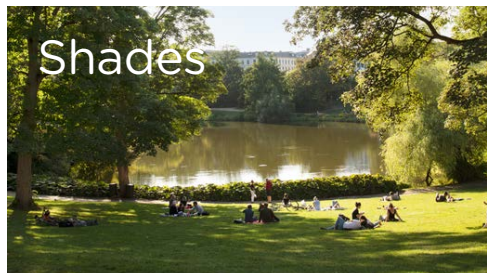
- **Water:** the critical shortage of fresh water.
- **Vegetation:** not so much the manicured landscape design, but the re-wilding agenda.
- **Biodiversity:** the near annihilation of biodiversity down to 30% of what existed as recently as the 1970-s.
- **Air:** green house gases in the atmosphere which have gone up by 7 times since the 1940-s.

While these are key ecological and design drivers, they are not all.

Ecology is also about **sound**; sound of a forest is very different from that of a tree orchard. It's about **colours** of nature versus those of a mono-culture plantation. It's about **shades** and massing of our buildings, **lines** in our buildings, **edges** and adjacencies, **solids** and **voids** that allow natural ventilation through.

The list continues, and extends into **coexistence**, **collaboration**, **justice**: both environmental and social justice, and **economy**: the value system we have, and finally, it is about **politics**: the way we run ourselves and the governance we have created.

The 16 drivers of Regenerative Design



Decarbonisation

Decarbonisation of our built environment processes is good, but is not enough to get us anywhere near the 1.5 degree target we have set for ourselves since the Paris Agreement.

The evidence for this has been compelling for sometime now. Latest reports by the UN's Intergovernmental Panel for Climate Change (IPCC) unequivocally puts to bed the "soft" ideas that decarbonization and tree planting will get us there. They won't.

Much more radical systems thinking is needed to roll back the damage and to heal the planet.

The question is whether we are really up for it? Or are we merely setting the chairs on the deck of the titanic?

Decarbonisation per se will not solve issues with water scarcity, floods due to hard surfaces we have built, heat island effects in our cities, plastic issues in our oceans, food waste issue, loss of life, species and biodiversity, and many other challenges our current lifestyle has created.

Carbon is but one of many challenges we face. We need to overcome the "carbon vision" some of us suffer from! We need Regenerative Thinking to address the ecological challenges that we have in a holistic and systematic manner.

Of the 16 dimensions of ecology listed, carbon is but one.

Regenerative



Regenerative Design is a system-based approach to our relationship with the environment. The approach sets to improve the environmental indicators while responding to the need for development. In a regenerative environment, every building/project sets to roll back the environmental degeneration that has happened over the years.

Regenerative Design is a sub-section to regenerative thinking, which in turn is a sub-section to Regenerative Worldview. Worldview is the collection of data, information, knowledge, insight and opinions, as well as intuition and beliefs in a subject. It is imperative that we start with Regenerative Worldview which is system-based and is a complete paradigm shift from all that we have done and developed in the sustainability era.



As such, Regenerative Thinking sets out to deal with a degeneration through a system-based approach which relies highly on knowledge acquisition from adjacent scientific disciplines like biology to get us closer to the mind and wisdom of nature.

Regenerative Design transforms multi-disciplinary design from a quest for a “compromise” to one that strives for “co-creation”.

It is not about architecture compromising to accommodate structure, (or vice versa), but about structure informing architectural design so that it is more than just a beautiful stroke of a brush.

It is about the space guiding the usage, acoustic informing the shape of the interior.

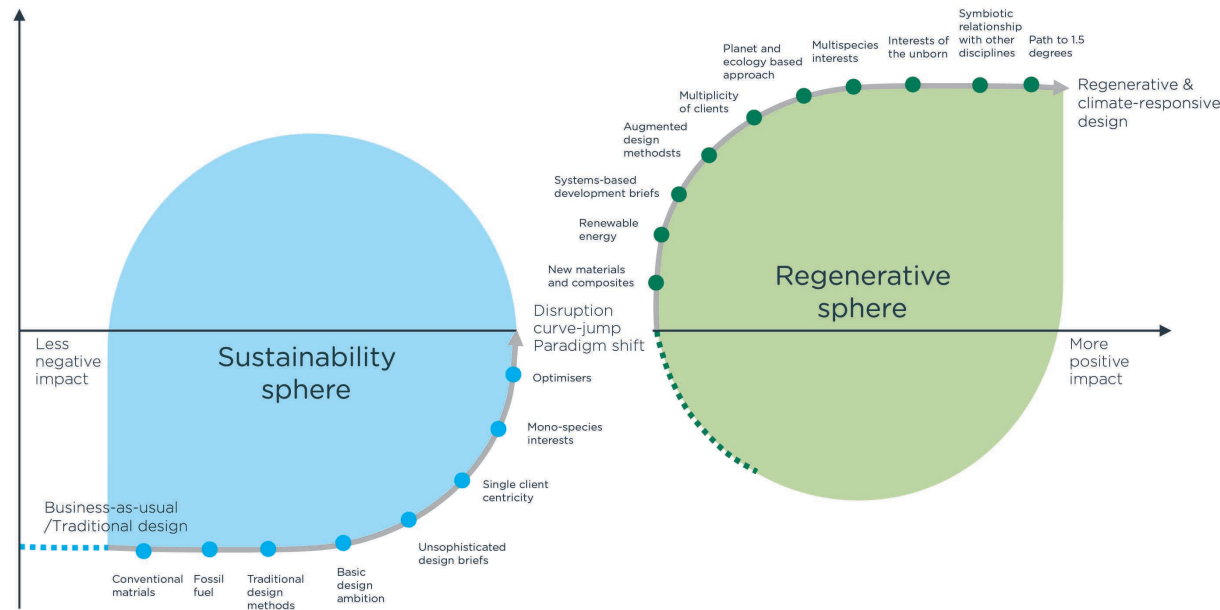
It is about a symbiotic connectivity in a functioning system where each node (discipline) sends ripples of goodness and knowledge to others in a continuous and generous manner.

Downsview, Toronto Canada
People, place, and nature come together in this vision for the future of Downsview in Toronto. Jointly led by Northcrest Developments and Canada Lands Company and with design partners SLA, KPMB Architects and Henning Larsen, we have reimagined the future of the expansive, 520-acre former airfield as a green-minded, human-scale and people-first community.

Project visualisation from Henning Larsen

Regenerative Lexicon

Sustainable vs Regenerative



The paradigm-shift of Regenerative Design. (Background image inspired by Reed, 2007 and Craft et al, 2017)

Formation of new paradigms start with new thoughts, which in turn start with new lexicon.

Whereas in the sustainable design era we pre-occupied ourselves with terms like conventional materials, fossil fuel, traditional design methods, basic design ambitions, unsophisticated

design briefs, single-client centrality, mono-species interests and optimization of existing processes, the Regenerative Worldview is full of terms and ideas like new materials and composites, renewable energy, augmented design methods, systems-based development briefs, multiplicity of clients, planet- and ecology-based

approach, interests of the unborn, symbiotic relationship with other disciplines, and path to 1.5 degrees.

Each and every one of these terms open up the vision and ethos of design and designers to a completely new world of possibilities and potentials.

Biomimicry: Emulation, ethos, reconnection

Biomimicry as a means of achieving Regenerative Design, is about emulating nature. This emulation or mimicry can be in terms of shapes, forms or systems that prevail in nature.

But biomimicry is more than just mimicking nature. It requires an ethos of respect and care for nature. It requires a feeling of oneness with nature. Our earlier reference to mother earth was reference to as though we all came from the same mother or ancestors. It made reference to a perception that we and nature were relatives with rights to enjoyment of all that mother earth or gaia had to offer. This attitude towards all that exists on the

planet is still prevalent in many indigenous communities that exist across the globe. They have kept that attitude and tradition going. A tradition that we held dear for more than 290,000 years of our specie's existence on the planet, and which some of us gradually lost over the more recent 10,000 to 13,000 years. And more so in more recent past.

Biomimicry is also about getting "re-connected" with nature as an integral system. It is about rekindling our long lasting relationship with nature. This reconnection will empower us to understand better the inherent wisdom that exists in nature, to synergize with its powerful forces and to understand the processes that underpins it.

It is these processes that we need to fuse with our own scientific knowledge to achieve true mimicry and congruence with nature.

Regeneration can be achieved with biomimicry. However, throughout the entire process, we must maintain a sense of humility and remorse towards the rest of nature. Our attitude in this respect must not be that of a valiant saviour of nature, having appeared at the last minute to slay the dragon and to save the whole world.

On the contrary, our attitude must be that of a reformed criminal who has become aware of the bad deeds, and who now wants to change course.



Establishing Complete Connected Communities

Designing for the human scale is a central tenet of the design vision, and mid-rise buildings will make up the bulk of the development. Transit nodes and major intersections will serve as densification points, supporting ease of movement both within the Downsview site and across the Greater Toronto area. In all, the plan calls for 50,000 units of housing for 80,000 residents that meet or exceed affordable housing requirements.

Regenerative Steps



Cultivating City Nature
 Downsview will introduce a new form of development – City Nature – that blends the built and natural world, integrating green infrastructure, biodiverse habitat, gathering spaces, and play into the public realm. Inspired by Toronto’s ravine network, and celebrating the example set by Downsview Park, City Nature invites nature’s generosity into the bustle of the every day, delivering public health, ecosystem, sustainability, and resilience benefits.

The process of Regenerative Design starts by a comprehensive and detailed study of the past environmental credentials of a site. A review of how a specific site may have contributed to the 16 parameters set above in a distant past.

The past journey to environmental degeneration of the site is then documented and quantified, where possible. A roadmap of ambitions and targets are then set on how to roll back the tide of degeneration, and on how to regenerate back the site. The study is that of the past, but the movement is into the future. In this quest, technology plays a key role, so does our understanding of nature and the wisdom in it.

It is through fusion of the hard technology and soft biomimicry that regeneration can happen.

Regenerative Chart & Opportunity Matrix: Regenerative opportunities chart is a tool that can be used to chart a road map to regeneration on any specific site, brief and development.

The chart lists out the 16 ecological design parameters, and identifies where there are opportunities to enhance these drivers on the site while at the same time developing on the very site. The chart helps identify qualitative potentials and opportunities that exists in a multi-objective viewing of

the drivers of brief, site, community and ecological drivers.

These ecological drivers can be selected from a wider range of drivers, depending on the specifics of each project

A scale of 1 to 5; 5 representing the highest opportunity; whereas 1 representing the lowest opportunity. The chart can be revisited and filled during different stages of the project.

Regenerative Design Chart



The evolving story of Regeneration

Regenerative Worldview is a true paradigm shift from all that we have been doing on the sustainability curve. This change in paradigm changes our attitude towards development from being defensive and reactive to being proactive.

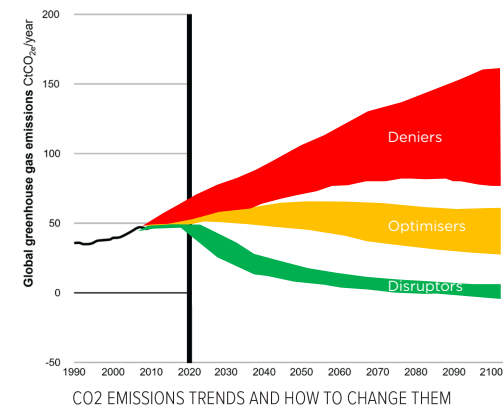
Regenerative Thinking sees the two distinctly different natural and built environments as entities that can be fused into one regenerative environment in which the built environment, with all its limitations, is underpinned with the systems which prevail in nature.

As “doing less harm” is still doing harm, then the sustainability attitude of “doing less harm” discourages development; whereas the “doing more good” mantra of Regenerative

Design encourages more development. Because the more development we do, the more good we can do. The attitude towards the site will also change from an inward looking view of how best we can do within the site boundaries, to an outward looking attitude of how we can regenerate the street, the neighbourhood and the city with our developments, one building at a time.

In our quest to address the environmental challenges we face, we all have our roles and responsibilities. While the road ahead is harsh and arduous, the good news is that for every environmental challenge we have, we have technically viable solutions.

We need all the energy, brain power and positive attitude we can muster.



Future scenario planning based on greenhouse gas emissions: The path of climate deniers and optimizers will lead to temperature rises of as high as 4.2 degrees and as low as 2.9 degrees; both are highly perilous to future of life on earth. Only the disrupter's path to 1.5 degree will lead to a healthy future



Singapore Pavilion in the world expo in dubai; a true oasis in the desert. it attracted millions of visitors; of all species

©Photo credit: Archmospheres



We enable society's transition to a future that flourishes

Ramboll is a global engineering, architecture and consultancy company founded in Denmark in 1945. Across the world, our 18,000 experts create sustainable solutions.

We combine local experience with a global knowledge base to create sustainable cities and societies, driving positive change for our clients, stakeholders and society. We enable our stakeholders to realise their goals and navigate the transition to a more sustainable future.

We call it:
Bright ideas. Sustainable change.

Jurong Lakeside Garden in Singapore

The garden aims to restore the landscape heritage, and the vision was to create a park where people, animals and plants can co-exist and bring mutual benefits. Now, this vision has become reality and the garden literally offers something to everyone.

Landscape by Henning Larsen



DESIGN is a periodical publication by the Design Excellence Board (DEB) within the Buildings Market in Ramboll.

The publication promotes and articulates latest ideas on matters relating to design, technology, environment and ethos within the design industry and the built environment, at large. It aims to address key issues facing contemporary design professionals, including our evolving relationship with the natural environment; as well as pressing political and social agendas for the built environment.

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