Going beyond sustainability

Adrian Alexander Poher (MSc in Social Responsibility), published October 2013

Today's concept of sustainability is encountering many limits and thus opposition, mainly due to the cloudiness of its definition. What are we trying to sustain exactly? A liveable world for humans and other living beings? Our economy? Similarly much criticism is being raised on the application, success and attractiveness of sustainability. Are we focusing too much on CO_2 emissions and energy efficiencies? What about the overall health of ecosystems? Rather than achieving more efficiency, why not use a method that is simply more effective? Academics, environmentalists and companies are realizing that sustainability, how it is generally understood, is not enough. They are looking beyond the horizon of sustainability to see what best practice is. This is coined under the term of regenerative capacities.

If we are to be truly sustainable on a planetary basis, one should look to thrive and not solely attempt to sustain oneself. Indeed this is how natural systems operate and this is what regenerative design strives to achieve. A natural system not only tries to maintain itself but also aims to achieve its utmost potential. Thus humans should attempt to work in harmony with the environment and between one another, so that co-creative partnerships can be realized within the socio-ecological system. Hence regenerative design focuses on permaculture principles and ethics (view table 1), ecological design as well as living systems thinking. We should work with nature rather than fight it. These are important approaches for regenerative design and should be included in the education of architects, authorities, urban planners and any person involved in the built environment. The principles on which permaculture is based on adheres to natural laws.

Regenerative development acknowledges the human built environment as a way to achieve optimum wellness for natural systems. When thinking about regenerative approaches, development is the result whereas design is the method of creating it. A regenerative built environment focuses on design that produces more energy and resources than it needs and uses, while removing and changing waste into beneficial resources. Under regenerative thinking, buildings are not to be considered as separate objects but are designed as integral parts of a larger system so that mutually beneficial interactions can be created with humans and the natural world. The built environment thus needs to be dynamic and responsive so that it can progress through time, achieving in this way continuous positive evolution. Through regenerative development humans can restore and create the capabilities of natural eco-systems to work at their maximum potential without regular human interference. The natural environment should not only be considered as a primary stakeholder but also as a participant and mentor for our ways of living.

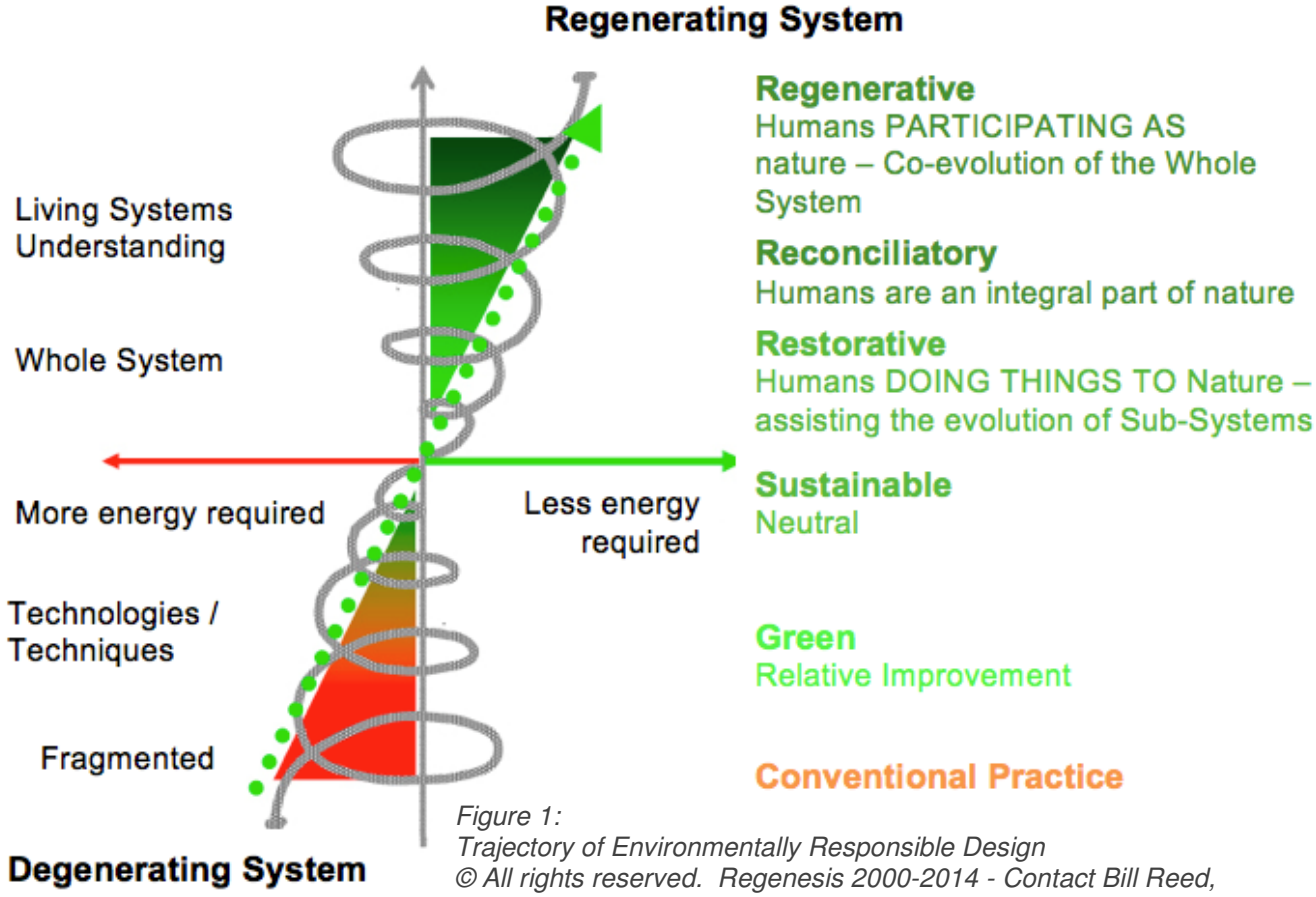

Figure 1:
Trajectory of Environmentally Responsible Design

The following principles relate to the figure 1 shown above and represent all the levels that lie below the general concept of regenerative design and development.

- Reconciliatory approaches such as Cradle-to-Cradle (McDonough 2002) and ecological design see humans as an inherent part of nature and that nature and humans are part of the same system. This design approach leads to no negative environmental and social impact for the built environment. No waste is created thanks to biodegradable and recyclable materials. Biomimicry lies under this concept as it involves assimilating the connection between humans and nature to improve technology in addition to imitating natural processes and aligning the built environment to the local eco-systems. Ecological design allows for mutual benefits to arise and improves human and natural well-being.
- Restorative development and design recognize that humans have negative impacts on the environment (air, water pollution or natural habitat degradation), so they attempt to restore and repair the affected area, thanks to human actions, such as brownfield and wetland restoration. This is the act of managing and manipulating ecosystems.
- Sustainable development aims at neutral impact while attempting to maximize efficiency. However green design does not question methods and processes that have negative impacts on the environment, as it only looks to reduce resource consumption, pollution and waste.
- Conventional practice is when there is no consideration for environmental problems in the design and use of the building as it only attempts to meet legal requirements.

Regenerative design realizes that humans, their built environment, cultures and society as a whole belong to ecosystems. It seeks to achieve the utmost health potential for the environment and humans on social, physical, cultural and economic level. In itself the term regenerative is valuable because it suggests the self-organizing, self-healing and self-evolving properties of living systems.

So how does one trigger and achieve regenerative development?

- First one must comprehend systems from a holistic point of view and develop skills in the recognition of patterns within and beyond a particular place.
- Understanding and designing through place-based approaches i.e. according to the local ecology and culture. This allows one to go beyond the theoretical side of things.
- The diversity and the uniqueness of each place in its social, cultural and ecological context have to be considered. Merging this with the human aspirations of a project should make up the fundamentals of the design in order to build a sense of place.
- Make the most of and understand the connections and relationships in the whole system and between sub systems.
- Include and use information and teams from all disciplines in the design.
- The more complex and diverse, the richer the design will be. Constant feedback and dialogue enable improvement in the long run.
- Multi-disciplinary and participatory design and construction methods should be employed
- One should look to regenerate ecosystems by conserving, restoring and stimulating their capability to work without human intervention.

Adapted from Reed (2007) and Pedersen Zari (2012)

Permaculture Ethics	
Care for the earth	Reduce consumption, encourage sustainability, respect and value diversity, reduce repair re-use recycle, there is enough for everyone's need but not enough for everyone's greed, leave wild spaces
Care for people	Duty to future generations to leave the planet more abundant than we found it, health and happiness, see opportunity in change, co-operation not competition, value everyone's experience and input, empower oneself to be part of the solution
Fair share and return the surplus	Work for equity and justice, share responsibility for the problems and solutions, give away surplus – what goes around comes around, share information because knowledge is power, support local activity. Nature is abundant and always produces surplus, which is re-invested in the system as food, seed, fertility and habitat. The yield is only limited by our understanding and imagination
Permaculture principles	
Beneficial relationships and integration	Create interconnection with different elements and build symbiotic relationships, the whole is bigger than the sum of its parts. Changing one element affects the stability of the entire system. This holistic design can save time and create healthy, diverse systems
Catch and store energy and materials	Identify, collect and hold beneficial flows. All cycles are opportunities for yield. Re-investing resources builds the capability to acquire more resources
Multiple functions	Perform as many as possible, advantageous linkages between diverse components to create a stable whole. Support from multiple elements in case of failure. The more use we make of each thing, the less we consume and the less we degrade the wider environment.
Leverage core patterns	Intervene in these points of the system where the least effort is needed to achieve the most changes
Small is good	Starting small and grow success progressively
Optimize edge	The edge represents the intersection of two environments. It is the most diverse part of a system, as materials and energy is concentrated and converted. Increase of decrease edge accordingly
Collaborate with succession	Natural systems are dynamic and continuously evolving, usually towards more diversity and productivity. Work with the tendencies and accelerate processes when needed. The only constant thing in the universe is change
Diversity	Makes nature more robust, balanced, dynamic, stable and interesting. Explore and celebrate diversity in everything… skills, culture, people, food, wildlife and most of all, ideas
Use biological and renewable resources	Renewable resources reproduce and accumulate over time
Local resources	Build productive local communities and economies. By using less energy allows us to connect with the local environment, increase the sense of place and return to living at a human scale. Deal with own waste within the local system
Cycling	Nature wastes nothing. Everything is cycled within the system, waste equals food for something else. Use of waste materials is a source for innovation, creation and art
Self-regulation and feedback	Work within the capacity of the land and people, use only what's needed and maintain healthy levels of production and consumption. Careful observation of place is needed as designs constantly evolve, responding to changes in the system and the circumstances

Table 1- Adapted from The Permaculture Association (2013).

The Willow School project in New Jersey, USA, is a perfect example of regenerative development but in practice by the Regenesis Group (2013). Both physical development and continuous place based processes have helped develop a community with the know-how and sense of care to live in the place in a regenerative way. Thus natural and human systems have been elevated thanks to the project, by producing more energy than it needs, improving natural habitat and soil thanks to wild meadow turfs. This allows hydroponic plants to use and treat waste and sanitary water in addition to mimicking the local natural systems. Overall this project has many sustainable strategies that not only are about efficiencies but also systems that foster the interconnectedness of humans and nature plus developing a sense of place. Information and picture are taken from www.regenesisgroup.com/CaseStudies.

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