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DECLARATION: I declare that I have substantially produced this paper by myself and have included text and bibliographical references to all contents obtained from or taken over from other sources.
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**Part A: Is ‘Positive Development’ through design a viable approach to achieving sustainability in settlements and communities in developing countries like South Africa?**

**Introduction**

The assessment is based on the assumption that the three most critical issues humanity will have to deal with throughout the life-cycles of buildings that are constructed now are climate change, global inequality and consumerism. All three of these will need to be progressively and systemically addressed – not in isolation – but in a holistic integrated way in order ensure that life on earth remains sustainable. These global crises could impact disproportionately on developing countries in the Global South as they bear the brunt of the first onset of climate change disasters. They are the least equipped to deal with these potential catastrophes of unknown proportions. Poor countries - the most unequal in terms of both human and physical development – are still catching up and will therefore need more energy input than developed countries if we are to ensure that the negative consequences of systemic inequality does not further exacerbate environmental destruction. This will in turn depend critically on perhaps the biggest crisis and the one we may have the most control over – consumerism and particularly the rampant over-consumption patterns of the rich developed countries.

Ecological design, therefore, must be systems to enable us overcome the three challenges in a pro-active way and to assist us in achieving the resilience and flexibility we will need to maximize in our relationship to ecosystems. Adaptation as a means to mitigate the worst effects of global warming may not be sufficient.

I will argue that a ‘Positive Development’ design approach – relying on very low energy consumption and vernacular models as well as facilitation of communities - could be a more suitable system for human development than mere technological leapfrogging to more efficient resource use as is widely advocated by development institutions. We would, though, need a philosophy of design and planning that will factor in time to think through plans and governance systems that need to be inherently based on recyclable resource consumption and a more equitable distribution of means of development.
1. What is Positive Design? (and what is it not)

Australian architect Janis Birkeland’s thesis is that current parameters for sustainability are inherently limited by its focus on adaptation and mitigation of destructive environmental impact and resource depletion. These conceptions are subscribed to by most mainstream sustainability debates, including the 1987 Brundtland Report, the 2006 Stern Review and most of the UN agency reports.

The radical axis of Birkeland’s approach is that it believes design – of houses, communities, cities and democratic institutions – could in fact heal and improve the environment and ecosystems, help to restore intra-generational equity and leave more for future generations. Her view is that we are confined by our obsession with quantitative measurements which sets the bar so low that it amounts to “price fixing” while making little substantive and qualitative difference. (Birkeland, 2008a:5)

“An objective analysis of our environmental frameworks, methods and tools will reveal that they are inherently negative. To design better systems, we first need to understand why the old systems do not work. This monumental death and destruction is by design, yet design is still widely regarded as a trivial pursuit.” (ibid, xix)

Birkeland builds on the pioneering work of American Sim van der Ryn’s architecture which introduced a design concept in the 1990’s that rests on integration of natural systems and technological advances by using nature’s systems and patterns in a context specific way. Like Van der Ryn, she argues that buildings that “externalizes and conceals negative impacts” and create “excessive waste” are often due to the systems people design and the processes these systems tend to reproduce. These externalities include health hazards, resource depletion, “wealth transfer” from the majority of people to a few and our overdependence on the “fossil fuel economy”. (ibid: 3)

Van der Ryn & Cowan’s earlier, but seminal work on ecological design, however, provides a more basic – and slightly contradictory – definition in which minimizing of damage remains an underlying motive:

The Architectural Institute of Japan (AIJ) describes Van der Ryn’s design as an ecological perspective that “minimizes the destructive impact on the environment by integrating itself
into natural processes” through the “conversion of materials, energy flows and selection of land use”. (AIJ, 2005: 67)

“We define ecological design as ‘any form of design that minimizes environmentally destructive impacts by integrating itself with living processes.” (Van der Ryn & Cowan, 1995: 18)

They do, however, hint at going further by asking whether ecological design can “heal the living world” beyond “accounting” for total environmental impacts:

“It compels us to ask new questions of each design: Does it enhance the health of the living world, or does it diminish it? Does it preserve relevant ecological structure and process, or does it degrade it? We are just beginning to make a transition from conventional forms of design, with the destructive environmental impacts they entail, to ecologically sound forms of design.” (ibid: 18 – 19)

Their approach is still not a decisive departure from the more corporatist definitions that stresses profits, efficiencies and reduction from “green” design. Hawken et al provides such a definition that describe “real estate development as more of an art” that does “less harm” but also “can actively rebuild community, restore pedestrian safety and access, and reduce the context of crime”. “And it’s even more profitable”, says the authors. (Hawken, Lovins & Hunter, 2000: 87)

The emerging dichotomy between mitigation and positive healing through design speaks of the classic ethical environmentalist dilemma about what to quantify and how to quantify scarce resources versus a more a more systemic paradigm that could integrate ecological values holistically. (Norton, 1991; Hattingh, 1999) Birkeland’s critique of the mainstream green building movement centers on its focus on tools to measure minimizing and limiting damage which would simply make it “less unsustainable”. Even “green buildings” as they are currently constructed increase consumption of eco-resources faster than we can regenerate the eco-sphere through technology.

“So even if all new buildings were green, it would only address a tiny fraction of resource flows …If we are to cut back consumption dramatically, therefore, we have to re-design existing development. We need a new architecture that increases the social and ecological use of space for less net cost.” (Birkeland, 2008a :16)
According to Swilling the classical definition of “green” ecological design is minimizing environmental impacts by integrating urban development into the eco-systems’ living processes. Mainstream tenets claim that technology can fix the destruction of our consumption patterns and, therefore, protect the environment. (Swilling, 2009: class notes) More sophisticated frameworks rely on redirecting urban metabolism through management systems that direct sustainable infrastructure and flows. (Girardet: 2004) Both are high-tech systems which imply capacity to implement and maintain, something that may be lacking in developing countries, even in South African cities. Advocates include those who believe that behaviorist market induced choices (Guy and Marvin: 2001) can change consumer patterns towards more sustainable flows.

Birkeland has stretched the sustainability paradigm much further to the extent that there may be a real departure from any attempt to ‘commodify’ resources or just addressing symptoms of systemic problems such as crime – and of course consumerism. She argues that current decisions around development and resource use still make for ecological system damage that are “largely irreversible” and that these trends cannot be spun around without change in the way we design systems and particularly complex systems. With this Birkeland asserts that current patterns of “systemic injustice” are not coincidences, but are reproduced “by design” within a “dualistic paradigm” where we are living lives that have little relation to the true value or meaning and resources of the Earth. (Birkeland, 2008a: 10)

This “disconnectedness” is what characterizes much of our building practice in South Africa – a fact that makes it difficult to convert conventional building processes to a more ecological design paradigm. South African eco-architect Andy Horn says reasons why eco-design and sustainable and appropriate building methods are not embraced include “denial” of the need for holistic systems, “distraction” by other mainstream trends and a “dissociation” of life cycles and its impact on nature that consumerist lifestyles generally induce. (Andy Horn, 2009: class notes) Van der Ryn and Cowan also stress the need for an inter-disciplinary and holistic approach, citing the way that nature and evolution has already facilitated complex systems from which we can learn and apply:

“No amount of regulation, intervention, or stand-alone brilliance will bring us a healthier world until we begin to deliberately join design decisions into coherent patterns that are congruent with nature’s own.” (Van der Ryn & Cowan, 1996: 20)

Birkeland’s 2008 book ‘Positive Development’ shows up what some have long called an ethical “split” in the sustainability debate, a departure from mere techno-fix paradigms to an
insistence that design should be brought on board to integrate systems more holistically.
(Swilling, 2009: class notes) The author further insists that “a direct design approach” or “design for nature” are not the same as a “managerial approach” to resources and urban planning and design, but in fact an “antidote”. This would go beyond implementing circular metabolism models in which the input and output of natural resources become a closed loop without damaging waste, but one that reverses past damage. No longer can we rely on “incentives” to induce behaviour change and better built environment practices, but need “direct action” to ensure that all systems make a positive contribution to livelihoods and the urban ecology without creating anything that could be termed “waste” and systemic injustice. (Birkeland, 2008a: xxii)

2. Both Sim Van der Ryn and Janis Birkeland are optimistic about the future because they believe it is possible for design to take into account sustainability. Is this optimism justified?

Evidence that ecological design which integrates natural and local building materials with cultural practice and new technology can reduce running costs of buildings already abounds. Amongst others Hawken et al. provides examples of three new “green development” buildings which can be viewed as “archetypes of a successful fusion of resource efficiency, environmental sensitivity, attention to human well-being, and financial success”. One, a Dutch bank, had “paid for itself” within its first three months by using 92% less energy than an adjacent building constructed simultaneously, while another pioneered “ecologically responsible work” by training staff in conflict resolution to bridge divides between diverse local cultures. (Hawken, Lovins & Hunter, 2000: 83 – 85)

Birkeland is, however, not optimistic about mainstream ‘greentech’ paradigms, even those as progressive as that of Hawken et al. She contends that technology to decouple wont by itself do the trick even in sophisticated “green” paradigms, saying all the handbooks on green steps wont help if we don’t change our orientation. Eco-efficiency is not a sufficient condition for the kind of long term ecosystem health that will render “net positive” equitable and improved “eco-services”. (Birkeland, 2008a: 7) A corporatist approach – such as that of Hawken et all is not a fix in itself, even if buildings could be 90% more resource efficient and that “reincarnated” buildings – retrofitting and recycling of building materials – can recover costs and lead to 60% reduction in energy costs. (Hawken, Lovins & Hunter, 2000: 98) Birkeland argues that our environmental toolkits are still honed on “symptoms” of degradation such as
waste and climate change, while we neglect analyzing the “root causes”, therefore limiting ourselves to a hostile “war with nature” in which we manage how much we can extract. (Birkeland, 2008a: 4 – 5) She is scathing about current “green” building paradigms that merely reduce rates of depletion of resources given that buildings use about 40% of all energy and contribute about 40% of harmful emissions. To ensure we reduce the impact of development we cannot solely rely on the slight improvement in resource flows of current green design, estimated at less than 1% improvement across the board.(ibid: 16) It means we should get over the perception that ecological services could be “substituted” once systems are degraded.

“Sustainability is not a technical problem; it is a design problem. Next to the military, the design of development is arguably the biggest contributor to the increasing rate of resource consumption, waste and pollution. We do not need accountants to tell us how much further we can go in the wrong direction before we hit the wall; we need to reverse direction.” (Birkeland, 2004: 3)

Van der Ryn is, however, buoyed by new technology that allows for decoupling but also to harness nature’s processes to regenerate resources such as “new kinds of industrial systems in which the waste streams from one process are designed to be useful inputs to the next” and being able to replace unsustainable resource use with “design intelligence”. (Van der Ryn & Cowan, 1995: 19).

“In nature, there is a careful choreography of function and form bridging many scales. It is this dance that provides the wider context for our designs. In the attempt to minimize environmental impacts, we are inevitably drawn to nature’s own design strategies.” (Ibid: 20 – 21)

Although there are dichotomies between their arguments, both Birkeland and Van der Ryn do seem to be convinced that design can go beyond the approaches of either conservation as such, or just technological innovation - in that design in itself can lead to healthier urban environments and ecosystems. These approaches can be integrated with existing and vernacular approaches to maximize our ability to restore harmony and resilience. Birkeland believes that we can even transcend current destructive patterns.

Is this a viable proposition? Can we move to an approach that allows for more integrated design that can “heal” the earth’s construction and consumption wounds? The concept that design can establish systems that can “heal” rests on several pre-conditions, including a
vibrant democracy with institutions designed to serve people and have the capacity to go beyond that to restore nature to vibrancy for further generations – as well as on resource consumption that does not exceed communities’ ecological footprints as well as longer term vitality of resources.

Birkeland argues that material flows do not escalate because of development itself or even population growth, but rather because of “the way we design development” and systems to manage resource flows. She defines her “design” paradigm as a conscious imagination of designing systems – thinking about future settlements that take in account the sociological and cultural systems that they shape and are shaped by. The implication is that she pulls the rug from under the “impact consultants” and Environment Impact Assessments (EIA) which are premised on “minimizing damage” that is typical of “green” building and construction movements. Her argument is that we are measuring the wrong things in our obsession with quantitative instruments such as “best practice” matrixes, which sets the bar so low that it is tantamount to “price fixing”. (Swilling, 2009: class notes; Birkeland, 2008a:5)

In a nutshell, ‘Positive development’ implies that the negative impacts of development could be reversed, leaving behind better ecological foundations and improved life quality through design. This is in contrast to “green building” as we currently conceive it – an attempt to “reduce negative environmental, economic and social impacts” of development. (Birkeland, 2008a: 8)

“However, financial, environmental and health gains from improving our cities cannot achieve sustainability if total resource flows continue to increase beyond the Earth’s carrying capacity. If we are to sustain the economy, then urban development must also restore and expand the ecological base of the surrounding region.” (Ibid: xix)

While Van der Ryn & Cowan is not in conflict with her vision, however, as they also stress that even using “natural capital” analogy in terms of natural resources, we are spending it irresponsibly, particularly in terms of mounting waste, and we cannot save nature if we merely “minimize this damage”, but design must enable the “unknown biological strategies” in nature to enable “ecosystems to flourish”. (Van der Ryn & Cowan, 1996: 21 – 23)

“Conservation alone cannot lead to sustainability unless it still implies an annual natural-resource deficit. In the years, before his death, Robert Rodale, editor of Rodale Press, was very concerned with what he termed regeneration. In a literal sense, regeneration is the repair and renewal of living tissue. Ecological design works
to regenerate a world deeply wounded by environmentally insensitive design.” (ibid: 21 – 22)

Birkeland calls on us to go beyond limiting benchmarks and to dig deeper for an intellectual ecological and social design framework that allows for “reversing” of unsustainable resource flows to improve the viability, health and resilience of eco-systems. This would include creative and imaginative leaps and “direct action” interventions to boost systems’ natural capacity to deliver goods and services to urban settlements and at the same time to increase equitable access to for instance water and food and enhancing “space” for people and natural processes. (Swilling, 2009: class notes) She calls for an “affirmative action” to “go beyond ‘impact neutral’ development” by creating “surplus-ecoservices” and “resilience” – adding to what previously existed in terms of natural and social “capital”, leaving it “better off”. (Birkeland, 2008 b: 2-3)

“Development is to take affirmative action to make environmental improvements beyond remediation and restoration by adding social and ecological value, both onsite and offsite, to over-compensate for embodied waste in production.” (ibid: 2)

BUT

“Where we lack the design capacity to expand the range of substantive life choices available to present and future generations (while preserving wilderness), we need to make development, land-use and resource decisions that are ‘reversible’.” (Birkeland, 2008a: xxii)

Birkeland, therefore, appears to say that where we are not sure what we are doing, we need to either not develop or do it is such away that we do not leave any scars, limiting future options. In terms of complexity thinking, this statement is far-reaching, because this emerging paradigm suggest that there is no way of predicting the behaviour of complex systems such as nature and therefore, the developer faces a substantial weight to make provision for all potentialities.

Birkeland is cautious, however, warning that no examples exist as yet of developments that “expand both the ecological base and the public estate in absolute or net positive ways”. (Birkeland, 2008b:5) “Genuine reversibility” will take account of the “cumulative impacts” of processes of building – both “upstream and downstream” – such as the embodied energy of materials through to its toxic end in a landfill. (Ibid, 2008a: 5) Significantly, the argument
appears to be compatible with progressive corporatist views such as that of Sandy Halliday who also stresses that “modern realism” about sustainable eco-design takes in a count that “today’s buildings will be unfit for tomorrow’s business, economic and societal demands”. Despite that, “whole-life costing” is an increasingly accepted approach which could contribute to reach the Millennium Development Goals with less money than projected costs. (Halliday, 2009: 64) Van der Ryn & Cowan stresses “durability” in ecological design and particularly the materials use. (Van der Ryn & Cowan, 1995: 26) There are thus substantial cleavages emerging around the green building approach of constructing steel-scrappers for posterity.

When principles are applied to construction, then they “would need to be fully integrated with structures to make buildings both eco-productive and cost effective from a whole system perspective”:

“Therefore, physical demonstrations of net Positive Development are needed to raise the bar for governments, industries, communities and homeowners.” (Birkeland, 2008b: 5)

And

“Regulations and incentives do not tell people how to do things, only what not to do. Therefore, exemplars of Positive Development are necessary to show how ecological, environmental and structural systems can be combined.” (ibid: 6)

In essence, Birkeland is calling for a new way of conceiving design and construction but also for changing the current economic tracks, a radically different pattern of consumption.

3. Is it really just a question of appropriate design, or are there powerful interests that will block any attempt to design more sustainable cities and neighbourhoods?

Exemplars of ‘Positive Design’ may not be enough to make the case for a new paradigm of design given the structural entrenchment of current practices. Birkeland argues that current
developmental institutions and power relationships tend to be skewed in favour of technological innovation that benefits large firms and state bureaucracies, for instance the kind of subsidies that does not factor in the full cost of development. In this regard one may note the South African low cost housing subsidy, used by developers to buy cheap land on the periphery which had the perverse outcomes that poor people have to travel long distances to work while reinforcing apartheid spatial inequalities. Other institutional obstructions on the road to positive development include a perpetual marginalization of design and planning during the neo-liberal era, therefore favouring “reductionist” and linear solutions and the reproduction of “failed templates”. (Birkeland, 2008 a: 19 – 20)

As the Case Study (Part B) will illustrate - the construction industry and the vested interests in supply chains – for example South Africa’s mass use of monopolistic cement manufacturers and its absurd export of iron ore only to re-import it for mass roll out of corrugated iron RDP roofs. Externalities – mass extraction, pollution and unrealized job opportunities through beneficiation – affect the poor disproportionately harshly. At stake is the self-perpetuating mode of our “industrial model of development” which is described as “pyramidal”, in relation to the hierarchical social systems and not only tend to pass on external costs of nature to future generations, but prey on the poor. This is exacerbated by rampant consumerism which “traps” people into high resource consumption patterns, while the building industry not only wastes resources, but increasingly also skills and talent. (Birkeland, 2002: 13 -14) This is despite the fact that there is evidence that companies – and consumers at large – can derive substantial benefits from sustainability in design over and above cost effectiveness in energy and maintenance. Hawken et al. further describes powerful perverse incentives in the building industry, suggesting these are symptomatic of a larger systemic constraint in need of “repair”.

“In a typical large deal, the real estate value chain consists of twenty-five or so parties who conceive, approve, finance, design, build, commission, operate, maintain, sell, lease occupy, renovate and dispose of the property. Most if not all of these parties are systematically rewarded for inefficiency and penalized for efficiency.”(Hawken, Lovins & Hunter, 2000: 92)

For instance, in South Africa, “thousands of people are employed in the coal industry” and much invested it, leading to an “understandable” resistance to coal consumption reductions. Beyond that, there is a history of cheap energy has also served as a disincentive towards zero energy systems and even Demand Side Management (DMS). There is also scant knowledge and capacity to implement these even if there was political and consumer will. This is despite vast opportunities through retro-fitting and DMS. (Swanepoel, 2006: 1; Grobler, 2002: 15-17)
Birkeland argues current over-use of environmental resources tend to be “subsidized”, while alternative building technologies – often entailing simple ecologically sound solutions to problems like dirty water – instead come up against “vested interests in existing wealth transfer processes”. These can rely very heavily on resources and capital. It is therefore possible to argue that mainstream “green” building processes tend to be favoured when they find synergy with market processes. However, this may often be in conflict with ‘Positive Development’ design solutions. (Birkeland, 2008a: 13) Carbon neutral and zero waste urban developments achieved by techno-fixes and even improved “metabolic” systems are not the only preconditions if the external resource use and its future “collateral damage” on ecosystems are not factored in. In addition, it will have to “reverse the social and ecological impacts” - both past and present - of urban development. This could be achieved in part through retro-fitting old buildings, while “integrated design” palettes for “dark green” buildings have already been proved to be less expensive to construct (without running costs factored in) than “pale green” technologies which merely reduces the “rate” of “degradation in the construction supply chain”(Ibid: 15 - 16) We need to do this in a way that does not upset vested interests, by making profitable equitable and sustainable resource use systems, both in private and public domains. It goes to the heart of Birkeland’s thesis:

“To be truly sustainable, cities must (among many other things) increase nature’s immune system and self-healing abilities. We need to increase the Earth’s ecological health, habitats and carrying capacity – simply to accommodate existing development and population levels, let alone to protect our life-support systems for the future. We also need to re-design existing development to correct or compensate for the past legacy of inequitable resource transfers. In reality, this can only happen if it does not disturb special interests. That is, the redistribution of resources would have to be achieved in ways that do not threaten anyone’s interests. Logically, then, development must make everyone better off (including the rich). We can only achieve this if development expands and enhances the ecological base and public estate. In other words, to be ecologically sustainable, cities and buildings must proactively heal the rifts between rich and poor, and between humans an nature. Fortunately, the physical and ecological footprint of urban areas can be reduced substantially.”
(Birkeland, 2008a: 14)

Birkeland maintain that we cannot just recreate nature or mimic it in our processes, but can design in such a way that nature unfolds in its own way - which dovetails with “deep ecology” principles. In this she also seems to embrace eco-feminist critiques of existing
production and consumption patterns and the way it violates “the integrity of organic, interconnected and interdependent systems” such as Vandana Shiva and Helena Norberg-Hodge. This is a warning against “maldevelopment” in the name of ecological practice. Both eco-feminism and deep ecology argues for a more spiritual approach to ecology that asks more incisive questions about the paradigm in which nature is being “preserved”. (Shiva, 1998: 274; Norberg-Hodge, 2000; Capra, 1996.)

“Social conflict, exploration and environmental destruction occur almost inevitably as a long-term consequence of pyramidal systems…Eco-logical design, which seeks more social and environmental value for less resources and energy, can reduce many of the side-effects – if not some of the causes – of inequitable wealth transfers.” (Birkeland, 2002: 16)

Current consumption patterns limit the viability of the ‘Positive Development’ approach. It tends to emphasize a lack of connectedness and wholeness and therefore is inherently at odds with more holistic notions of development. Zygmunt Bauman notes that “no lasting bonds emerge in the activity of consumption” nor cooperation as he describes it as “solitary” events lasting only as long as necessary for the act of consumption. (Bauman, 2007: 77-78):

“To serve all those new needs, urges, compulsions and addictions, as well as to service new mechanisms of motivation, guidance and the monitoring of human conduct, the consumerist economy has to rely on excess and waste. The prospect of containing and assimilating the unstoppably swelling mass of innovations becomes increasingly dim – perhaps downright nebulous. This is because to keep the consumerist economy going, the place of adding to the already enormous volume of novelties is bound to overshoot any target made to the measure of already recorded demand.” (ibid, 38).

Like Hawken et al, Grobler and Swanepoel, Birkeland believes that these vested interests – along with the consumption patterns - could, however, be turned into opportunities. She estimates that construction makes up half of all “national capital investment” and makes the succinct point that this implies that there is some measure of control over one large resource intensive area of consumption – by contrast to the military and market extraction of scarce and valuable resources. It also has the potential to create sustainable jobs at a ratio that is not more expensive than current investment in the built environment. This means that developing countries have a large – often untapped – area that could contribute to a range of development
indicators – health, sustainable clean water, livelihoods with decent jobs and safe communities – by choosing a more positive developmental path by design. (ibid: 8)

Developing countries are, however, vastly constrained in terms of applying ‘Positive Design Principles’, as the next section would argue.

4. Even if sustainable design becomes the most favoured approach, will this not just result in greener cities and neighbourhoods for the rich to the detriment of the poor? And will developing countries like ours need to go beyond just greening of design to include ways of building socially mixed neighbourhoods?

The 2008 UN-Habitat report on African cities suggests African cities could expect a more than 100% population growth in the next 20 years and will again nearly double by 2050, marking a definitive urban shift with more than half of its inhabitants living in cities. (UN-Habitat, 2008: ‘foreword’ & Ch. 1.1 ‘summary and policy recommendations’) More than 70% of Africa’s urban population already lives in informal settlements, more than twice the global average of slum dwellers. The overcrowding and tenure insecurity is exacerbated by lack of water and other basic services and the general trend is poverty and “social exclusion”. (UN-Habitat, 2003: 11-13) Furthermore, the slum formation is often on the periphery of cities. (UN-Habitat, 2003: 195)

“In some of the fast-growing African cities almost all of the current urban spatial growth is the result of slum and informal settlements proliferation. It is therefore perhaps not surprising that urban environmental problems claim an estimated one million African lives each year.” (UN-Habitat, 2008: ‘Introduction’).

With particular reference to the urban developmental ravages in poorer countries, Birkeland insists that many die unnecessarily from bad design, calling the existing approaches to resource extraction – while many are still denied basic access to basic resources – “genocidal”, and stressing that “inaction in addressing inequities” amounts to a “deliberate form of action”. (ibid: xviii -xix) She argues strongly that conventional design systems tend
to entrench unequal “opportunity and status”, ensuring for instance that the rich live much longer and healthier lives than the poor. This happens through “vicious circles” of “waste, consumption and pollution” which often become a key driver of social conflict, while we are almost blind to the idea that we can improve relationships and equity through design. (ibid: 6-7)

The developmental conundrum is exacerbated by the fact that 2050 projections by the International Panel on Climate Change (IPCC) provides limited scope for developing countries to catch up in terms of energy use for development before emissions will have to be curtailed radically. At the same time we need to design institutions and systems that will create more equitable distribution of resources, and even provide restitution. Cities, according to Swilling, could be the “fulcrum” for bailing us out of the dilemma, which will require focused crisis interventions by the state, particularly infrastructure investment to bring us into a cycle of Green New Deals which would hopefully contribute to getting us out of the climate change crisis. This could, however, amount to ‘greenwash’ by “Bright Greens” - those who are technologically optimistic. If they are wrong, however, and the current ‘policrisis’ showed a need for a deeper and more fundamental overhaul of our systems than new technology -it may result in a bigger crisis 20 years from now. Another technological era of growth may result in even more inequality between the technology empowered rich North and the capacity challenged poor South which in itself may become the most persistent threat to sustainability whether or not the Stockholm Climate Change talks result in a substantial technology transfer or not. (Swilling, 2009: class notes)

While most of the developed nations’ buildings that will meet climate change are already built, the implication is that developing countries generally and Africa in particular, have the chance to build almost from scratch to meet the crisis. One option is to densify existing cities, but food scarcity predicted for Africa means we may have to rethink existing paradigms to rather build into neighbourhoods ample space for urban agriculture to ensure food security.

I will approach the outlines of such a debate from a perspective of ‘Positive Development’ through ecological design that would be appropriate and context specific for African cities. Building whole new settlements pro-actively to accommodate the urban shift is not far-fetched. For instance, in “400 New Towns: A Fetish for Newness”, an article published in “anticipation” of a book on “The Chinese Dream”, Neville Mars of the Dynamic City Foundation stresses that while growth can be restricted to urban centres through densification, in the Chinese context the reality is that “new cities and satellites are unavoidable”. While we may want to densify our way out of the immediate problem, there is little choice but to “try to
conceive a sustainable urban format for the new (satellite) city. He says the reality on the ground "necessitates an integrated and practical approach". The Chinese are therefore building 400 towns from scratch. (http://www.BURB.TV.)

In addition, a Global Green New Deal of $41 trillion worth of urban infrastructure - particularly water and energy systems – is being touted as a way of making cities more adapted, resilient and flexible in the face of climate change and the need to scale down carbon emissions. (Doshi, Schulman & Gabaldon, 2007) This is about double the $20 billion predicted that countries globally would spend on carbon intensive energy sufficiency by between today and 2030. The UN states in its 2007/2008 Human Development Report on Climate Change this projected investment infrastructure “to meet energy demand could lock the world on to an unsustainable trajectory”. This was extrapolated from the Stern Review, which said that to achieve stabilisation of global warming by 2030, would mean spending 1.6% of world GD – “less than two thirds of global military spending”.

“The cost of inaction could be much higher. According to the Stern Review, this could reach 5 – 20 percent of world GDP, depending on how costs are measured.”

(UN, 2008: 15)

A “Positive Design” approach to the built environment could not only leave the ecosystem better capable of regeneration, and reduce the lethal consequences of bad construction, but Birkeland make the far reaching claim that it could also be used as “a level for social transformation” – a catalyst for more equitable communities. With this she builds on the environmentalist stance that by ensuring equitable access to resources, the improved social justice could remove the “underlying causes of social conflict”. But holistic and long-term social change and sustainability crucially depends on a number of “preconditions”.

“Achieving sustainability (by any definition) will be a complex, multidimensional challenge. It will involve public engagement, debate, education and a new ethic”; new forms of governance and conflict resolution, family planning and support, new economic institutions and management frameworks; basic changes in planning, policies and priorities; and empathy and compassion.” (Birkeland, 2008b: 4)

Such institutional prerequisites is not only a massive challenge even in countries with entrenched democracies, but in any setting guaranteed to come up against a range of institutional and private vested interests. If practicing “positive development” means increased access to food and water or rebalancing “power and wealth”, then it is certain to
stumble across entrenched private property hurdles – the vested interests of the elite. However, neglecting these crucial building blocks will mean continued inequitable access to basic resources and therefore the likelihood of that “urban space for both people and natural processes” will not be achievable for current and future generations. (ibid: 4)

“We need instead to make life, social and human-ecosystem relationships central to planning and design. This would mean a wider range of healthy lifestyles, environments and social connections.” (ibid: 9)

Beyond appropriate institutions, the key questions that Africa – as the world’s most underdeveloped region - would have to ask about design for new infrastructure and buildings then, are what kind of technology is most appropriate; who decides about what is appropriate and how we “design” these technological systems so that we convert to sustainable urban “resource flows” that are premised on “fundamentally restructuring” our economy and urban resource culture. (Swilling, 2009: class notes) A serious question therefore remains whether any of the “green” building design formats such as Birkeland’s can be seen to be appropriate for the continent and whether we have the capacity to implement Positive Development when we are struggling to ensure decent livelihoods though the provision of basic resources.

There are already models for “redesigning community” that could be drawn on, even market based experiences. Hawken describes New Urbanism lessons in which densified, integrated housing – for instance “clustering houses around mini-greens” – with watershed restoration and “green” roofs not only reduces sprawl and the depletion of nature, but also often costs less, have better resale value and more significantly creates community. (Hawken Lovins & Hunter, 2000: 106 – 109)

“The unexpected and outstanding success of such integrated-design projects in real estate markets is starting to persuade developers to rethink many of their basic assumptions and to reimagine development as a tool for restoring nature and communities. Where these still evolving trends will lead is not clear. But what is evident is that the isolation, car dependency, and social pathologies that afflict late twentieth-century American suburbanism are an aberration.” (Ibid:109)

However, Birkeland believes that in order to have a net positive effect on building’s impact on its ecological surroundings means the integration of eco-service spaces and living spaces vertically and horizontally. (Birkeland, 2008a: 13) For instance, Birkeland postulates that
where space is at a premium, an “edge” of vertical and horizontal eco-zones could be installed on walls, roofs and allies to contribute to eco-services – “design for nature by creating the infrastructure for natural systems to unfold in their own way”. (ibid, 16 – 17)

She describes a sophisticated design proposal for an Australian National Sustainability Initiative (ANSI) institute, based on the concept of “ecological space” through “green scaffolding” to retrofit older buildings or “Green Space Walls” or greenfields projects that would hinge on ecosphere spaces that would simultaneously serve as “mini-laboratories” to measure positive development’s impact on the ecosphere. These are to be integrated into movable structures. It includes “vertical landscapes for water and air purification”, mirrors to spread light through the building, “habitats for small animals to breed”, “mini-zoos that create animated wallpaper’ when viewed from inside”, “vertical composters and worm farms that are visible to building users”, “living machines to treat grey water (and even sewage) in sealed modules” as well as “lightweight vertical wind turbines integrated with vertical trusses”. These are meant to demonstrate that externalities and substitution could be reduced, by addition of “natural systems” to buildings that will go beyond “carbon neutrality” to integrate them into ecosystems to support it while optimizing “human comfort”. It will be non-permanent but durable. (Birkeland, 2008b: 6-8)

While of experimental interest, it is not an example – if it is built – of priorities or needs in buildings for Africa and it would imply massive capacity and material input.

Birkeland also argues – somewhat contradictory to her ANSI design - that “locking up” green areas in our circumstances of vast need and poverty will be “morally indefensible”. However the author believes adequate greening that will increase the environmental basis for living without dumping externalities elsewhere is doable through a “new design paradigm”. We will have to go beyond green cities but move towards RUrban design and development in which the city and its ecological surroundings will have to form a true “symbiotic system”. This means that cities will have to make space for livelihoods such as “gardens for living” and gardens for eating. Existing property and land use patterns will make this very difficult to achieve in our high inequality cities. (Birkeland, 2008a: 14)

“The only way we can create a ‘positive’ ecological footprint is to design cities so that they not only function like eco-systems, but also enable ecosystems to flourish…Design for eco-services implies that we need to design for nature (ie design for eco-services), as well as with nature (Living Machines) and like nature (biomimicry).” (Birkeland, 2008a: 17)
In some ways then, Birkeland’s approach is also high-tech and somewhat Eurocentric. A more appropriate application for Africa – that still take cognizance of Birkeland’s concept - would be how Auroville reversed in 36 years a desert wasteland by settling humans into nature through permaculture systems. It showed that eodesign needs to take in account an investment in the ecosystem and its bioregion, such as capturing water sources, restoring flows and soils and planting trees to resuscitate top soil. It is a way out of thinking about design solely about limiting damage. (Swilling class notes) Diverse groups from around the world started the 1960’s project as “an experiment in human unity” which features areas for peace, green industry, living quarters interspersed by parks, an “international” cultural zone and a long “green belt” with organic farms. There is a culture of sharing the creation of ideas. (http://www.auroville.org)

Her arguments also find practical expression in the Goa forty year design to improve the Indian city of Panjim through a RUrbanism paradigm, where “green” design is taken further to ensure improved natural space by transforming infrastructure and correcting the balance of power in terms of land use systems and access to healthy resources. (Swilling, 2009: class notes)

Goa’s RUrbanism was a “radical departure” from the usual practice of first designing the urban spaces and then factoring in green space into what is left. The designers relied on a “design process” using water as the “critical integrating element” with eco-basins the matrix for the design. It said the rural and urban integration for livelihoods thus achieved meant a revival of India’s “Gandhian dream”:

“To do that, cities would have to stop being parasitic on their region or ‘distant elsewhere’s’, and become ‘net producers’ of ecological services – what we term the second urban revolution. Furthermore, settlements would be structured around ecological and resource boundaries to enable efficient governance.” (Revi, Prakash, Mehrotra, Bhat, Gupta & Gore, 2006: 63)

Throughput of resources were tracked through extensive IT and biotechnology systems in “currencies” such as water and food to ensure a balance in the city’s metabolism which was crucially linked to ecosystems and “networked” through urban centres – which in turn was designed as dense, mixed use nuclei with “green fingers penetrating into the settlements”. This enabled the city not to rely out hinterland waste sinks. (ibid: 64 – 65) The designers found that there were few international examples of designing integrated “sustainable
infrastructure systems” such as energy and transport and had to investigate from scratch – an indication of the lack of attention design has had even as urban planning itself had been marginalised throughout the Neo-liberal era. (ibid: 54) The design created livelihoods such as “eco-tourism”, “sustainable agriculture”, forestry, aquaculture, renewable energy and education, in conjunction with new “systems of governance” and the “transformation of current institutions” to seed “new values and ethics” for a sustainability transition – such as “sufficiency and equity”.(ibid: 62)

Other models include the district developed from an old army base in Vauban, in the German city of Freiburg here “legal, political, social and economical actors from the grassroot-level (sic) up to the city administration” are integrated in planning through participation. (http://www.vauban.de) Another example rated “positive” rather than just “green” by Birkeland is the “poor” Brazilian city of Curitiba and its innovative recycling system that provides extra incomes, the conversion of the city’s floodplain and greening of spaces, the low petrol bus rapid transport system and its subsidization of risks as well as profits. (2008: 13)

Japan’s IBEC institute stresses the “nested layers” and structures of the built ecological environment and the need for this to be “symbiotic”. It does not agree with “islands” of ecological features. Although this is stretching Birkeland’s example, it is worth noting that processes to integrate nature into built environments will be “unsuccessful if ecosystems are left isolated like islands within the urban sprawl. It opts for the Goa approach of green fingers penetrating directly into city hearts. (AIJ, 2005: 70) On the other hand, the institute argues that our philosophy of design should “conform” to natural systems of energy and material cycles – saying, “we must create “architectural ecosystems”. (ibid : 74)

AIJ advocates the permaculture model developed by Australian Bill Mollison which brings food cultivation back into cities and promoting community self-reliance through the use of local species. The word is a “contraction” between the words permanent agriculture and permanent culture abased on both land use and agriculture and infrastructure and emphasizing the relationship between humans and nature in a “cultivated ecology” that takes account of the full spectrum of yields of a given system, not just commodities. This is done through connected lay-outs, “circulation of matter and energy within small areas or a region or building”, and ensuring that “each element performs more than three functions”. This promotes “social diversity” and maximizes the development of rich diversity at the edges. (ibid: 67)
Permaculture models underpin initiatives to “revive or recover or rebuild local ecological or environmental assets of land, soil, and vegetation with local labour and local resources”. They describe the “political economy of permaculture” as “interventions” at micro level to ensure food and work security, basic immediate needs - which in turn tends to restore local species and perpetuate traditional knowledge.


Among a range of do-able Positive Design applications, Birkeland mentions the use of a “watercone” to clean water through “evaporation” in a “clear plastic sloped surface over dirty or salty water”. She says the concept could be combined with her “Green Scaffolding” modules for purifying water in buildings.

“The heated water evaporates and condenses on the surface, without taking the impurities with it. The water then runs down into a collector. The proponents claim that watercones could save thousands of deaths related to dirty water… For example, a wheelbarrow has been designed to be used by villagers that have to walk long distances to collect dirty water from streams or wells. The water is purified by the sun as the person walks back their village.” (Birkeland, 2008b: 4-5)

She also proposes “firefighting landscapes” where ponds and community centres could be turned into integrated water cisterns which could be turned into fire fighting systems in areas which are “fire sensitive” like African cities. In addition, the “living Machines” concept where ecosystems could recycle grey-water and sewage into productive fish and plant systems through a microbic biological chain within a small greenhouse area. (ibid :3) With these extreme examples, Birkeland wants to go further than the general sustainability call for “mixed use” neighbourhood integration, but a micro level integration of “human and ecological functions”. (2008a :17) Other more practical and cheap examples that could serve at least the middle classes could include “retrofitting” car garages at home into greenhouses. (Ibid: 16) Architecture inspired by nature is not new, but she warns against “modeling” technology - for instance air-conditioning - on “termite mound construction” because its mechanics may make it seem more “green” than it is, while it does not fulfill a positive healing effect on the habitat. It needs to go beyond “biomimicry” that are simply expensive substitutes – or “monopolistic” corporatist crutches - for example outer space “sunshades” to divert the sun, “artificial trees” that absorb carbon and using sea spray to create denser clouds. Instead low cost interventions such as retro-fitting could help counter unemployment at relatively low cost, solving both social and ecological problems without risk. (2008:16 – 19)
There are, therefore, ways in which poorer developing countries can facilitate marginal, but positive, development that may go beyond greening towards catalysts to promote equitable and sustainable delivery of resources and services to urban areas through technologies that are modeled on the flows of live systems, rather than technofixes are available. These will have to be designed carefully. Beyond technological capacity constraints, there are also questions about how viable the agenda is politically in developing countries that are still in transit towards democracy with rapid urbanization adding to urban resource use complexity. For instance, who will decide when the risks are so high?

Hawken et al. notes that to counter the tendency towards informal settlement on the periphery in developing countries would mean immense capacity to design and plan. (Hawken, Lovins & Hunter, 2000: 106 – 108) The DBSA says in a new booklet on the integration of development and environment that South Africa lacks “information, coordination and skills” as well as “institutional capacity” in all spheres of government for proper environmental management. There is a dire need for capacity building and “appropriate skills and “holistic thinking” to be fostered “in all forms of development planning”. At local level, where planning decision capacity is crucial, there are a dire lack of skills and resources, with politicians often overruling decisions while developers bulldoze their way through by falsely claiming pro-poor and environmental agendas. It says communities do not have the capacity to meaningfully engage. (DBSA, 2009: 13 – 14)

“The reality is crisis management. The win win scenario possibilities are foregone. The issues at stake are life and death issues. One has to get real with what is happening out there – there is no time to think about answers.” (ibid: 14)

Its research found that “environmental tools” such as Bioregional Planning and Conservation Action Plans are often used inappropriately and even alienate communities– and sometimes diverted attention away from underlying issues. Government agents did not understand their tools properly, while financial institutions used it to cover their risks and not for sustainability. (ibid:18-20) There was nevertheless a need to create champions and build on the tools through integrating them:

“Successful initiatives tend to mix, tweak and match and borrow from a whole host of approaches and tools and this occurs through a continuous cyclical creative and learning process. The cycle takes on energy of its own as peplum strive to make
meaningful changes in dynamic and complex decisions at multiple levels and using trans-disciplinary approaches.” (ibid: 48)

South Africa, therefore, is at a disadvantage in that the capacity to meaningfully design – which entails vast consultation processes – as well as implement sustainable building that would address its own poli-crises of poverty, inequality and under-development, is limited. But the new South African Minister of Sustainable Settlements Tokyo Sexwale has apparently embraced the concept of more holistic provision of housing in line with the government’s Breaking New Ground policy. In his budget vote speech in Parliament in June 2009, Sexwale mapped out a ‘beyond housing’ vision, saying that “to ensure due care for human dignity” would mean cutting into the enormous housing backlog by “not only focusing on holistic and integrated planning, but also paying attention to the greening of communities and alternative energy sources such as solar and wind power and other environmentally-friendly technologies”. He promised that the “golden thread” that would run through the process is “consultation, and community involvement for community development” including on “planning and design” and “appropriate design models” and that in Africa’s Urban Century each new home would be “an economic catalyst”.

(http://www.polity.org.za/article/sa-sexwale-budget-vote-speech-by-the-minister-of-human-settlements-parliament-30062009-2009-06-30 - 12 Jul 2009 18:40:27 GMT.) However, a recent resurgence of five years of local government protests about non-delivery has shown clearly that consultation processes based on “corporate stakeholder” involvement models have not been a “catalyst” for stability, resilience and development. The vested land and business interests of powerful corporates tend to trump in cities and a way will have to be found to balance equity and investment in new economic tracks.

Meg Keen argues that urban ecology – the ‘complex systems of relationships and interactions between people’ and environments – will only move towards sustainable systems if problems are appropriately “perceived”, the necessary “knowledge and technology” is then developed; and critically on the “political will” and the organizational arrangements that would “support a systemic, rather than fragmented, response”. (Keen, 2002: 59)

“Increasingly, there is an understanding that human well-being in cities depends upon its integration with ecosystem health, and to achieve that integration, greater civic engagement is required.”(ibid:60)

Birkeland’s call for an “affirmative action” to “go beyond ‘impact neutral’ development”; to go beyond remediation and restoration by adding social and ecological value - both onsite
and offsite - to over-compensate for embodied waste in production, sets an even higher bar
that will be difficult to achieve. (Birkeland, 2008 b: 2-3) In addition she says we should rather
“make development, land-use and resource decisions that are ‘reversible’” when we don’t
know where we lack the capacity to leave present and future generations better off.
(Birkeland, 2008a: xxii) It is crucial to keep in mind her claim, that if we set the bar lower, we
are merely engaging in price-fixing. (ibid:5)

The statement is particularly loaded for Africa, where capacity is limited, when indications
are the continent will be least equipped for carrying the brunt of global warming. Complexity
theory teaches us that the implication is that this means we cannot just give up, but will have
to bring stringent ethical considerations to bear on all decisions. Such decisions cannot be
taken at random, even if well-meant. It therefore, calls for a more radical democratic decision
making system about design and planning.

“For future generations to enjoy substantive democracy, they would have to be
ensured the same or a greater range of meaningful choices and environments as we
have today. So we need a stronger conception of sustainability: expanding future
options, or at least keeping options open. This suggests that sustainability will require
not only behaviour change, but fundamental changes in the way we design our
institutions, infrastructure, buildings and decision-making systems – and ultimately
even our cultures and religions.” (Birkeland, 2008a: xvii)

‘Positive development’ is presented as a paradigm that already factors in a drive towards
equity and is geared towards systemic change of inherently unsustainable structures - along
with and - as integrally part of ecological sustainability. It suggests design for net eco
services and “a shift away from environmental management frameworks that legitimize trade-
offs” and “incremental targets”. This will imply “new forms of design” as well as
“transdisciplinarity” and “eco-governance”. With eco-governance is meant a range of
technical and institutional arrangements that respects diversity and not randomly fitting out-
dated paradigms to new challenges. (Birkeland, 2008a: 22)

This is where the proposal, however, becomes tricky. If better planning and decision making
systems are needed to prevent bad decisions and not just reverse them, then many poor
countries may not be able to achieve “positive development”. Their relative power and
sovereignty vis-à-vis trans-national capital and vested interests, at international and national,
but particularly at local level, has proved to be inadequate to drive even “basic needs”
priorities. At this level, I find the concept therefore too ambitious. It goes to the heart of the
quality of democracy worldwide and the enormous mind shifts necessary to effect systemic change. Birkeland acknowledges the scale and depth of the problem:

“Ultimately, it is only the citizenry that can bring about the large-scale, cross-sectoral, whole systems change required, through NGOs in partnership with other sectors. Participation in decision-making and design is essential, though not enough. Civil society will need to re-negotiate the social contract. Business and industry will not adopt substantive due process, which is essential to meaningful public participation, without an eco-sensitive and more democratic constitutional framework. New kinds of decision systems are needed that make decision-makers, not just the general public, more accountable.” (Birkeland, 2008a: 22)

Hard questions should therefore occupy our design and development discourse. A sustainable development philosophy of design would have to be ethically underpinned by democratic governance institutions that promote equitable and just resource allocation.

**Conclusion:** I conclude that Positive Development is an approach that provides us with potential avenues to transcend patterns of exploitation through integrating design and natural systems in a way that not only does no harm but will leave the earth richer in resilience. It does, however, ask us to pose the kind of questions of our design and decision-making institutions that goes deeper to the root of the inequalities, uneven development and over-consumption at the heart of our current world crises. These questions are critical for Africa and other developing countries as they enter their urban age. I have reservations on whether they have the capacity to implement any “green” paradigm - whether it is techno-fixes aimed at mitigation or the ‘Positive Development’ model. We will have to transform the way we decide and that in itself will require us to ask critical questions about our systems of political engagement and governance.

To help answer the question on how a country like South Africa could approach ‘Positive Development’ in building socially mixed neighbourhoods - beyond “green building” - the case study will show that there is little substitute for working with communities in order to render spaces that are owned and lived and experienced. We need to change the culture of how we design.
Part B: How can Positive Development through ecological design make a difference in the context of developing countries like South Africa?

Introduction

There is optimism that Positive Development could go beyond mainstream green approaches to address and even correct systemic problems and heal both natural habitats and communities. There are some questions whether the approach – which involves the integration of high-tech energy and resource techniques and technologies – can work in developing countries like Africa given capacity and knowledge constraints.

I present a case-study based on the work of an architect that had embraced ecodesign principles and evolved it for local conditions in a way that is not heavily reliant on technology. Although he was not familiar with Birkeland’s latest pioneering arguments, he does share her belief that design can not only overcome resource constraints, but actively contribute to a healthier ecosphere and communities. His evolvement as ecological designer brought him closer to vernacular approaches which are combined with the principles of Permaculture, the holistic philosophy of Rudolf Steiner and the architectural innovations of Frank Lloyd Wright.

The case study will also argue that Positive Development’s key application in Africa may be the role of the designer as a “catalyst” for sustainability and the architect the “facilitator” of social healing. (Van der Ryn & Cowan, 1996: 25)

I have used the Sustainability Institute’s Seven Senses framework to present and assess the ‘positive development’ aspects of the work of Etienne Bruwer of Greenhaus Architects in Constantia.

1. A sense of Limits – In the context of Birkeland’s revolt against “limiting” of damage, this “sense” may rather be read as one that asks ‘what is enough’, rather than how much at what cost. Or perhaps it could be seen as part of a permaculture philosophy that suggests that everything needed should be yielded by the system, therefore limiting our consumption of resources to boundaries. However, complex
Highbrow residents of Constantia were aghast when Bruwer started planting grass on his roof. The roof defines his commitment to sustainability – living every bit of what he preaches. It is the chief form of cooling for the main dwelling on his property, a converted orchid packing house that has been serving as home for a decade or so while the soil is restored before the real main house will be built.

“Many chuckle about my roof “garden”, but much of Europe was built like this, shelter either under stone or turf, because that was what there was, and perfectly suitable for insulation”, says Bruwer.

Hawken et al says “green” roofs with grass, moss or flowers are now so popular in Central Europe “that it is hard to get a permit for a flat-roofed building in Stuttgart without making the roof green”. He describes it as a way of having plants not just near to buildings but “on and over” them:

“These systems are encouraged and even subsidized because they reduce both flooding risks and cooling needs.” (Hawken, Lovins & Hunter, 2000: 108)

Photograph 1: Bruwer and his green roof at home.
Japan’s AIJ also argues that green roofs – and walls – can along with their surrounding gardens become significant eco enhancers “as a component of the local biotope network”.

“Such green spaces become habitats for diverse life forms. Rather than destroying, we should enhance the biotope network by creating new buildings that are integrated with greenery and conform to landscape ecology…Crowded construction has destroyed spaces that provided organisms with safe mobility and habitats.” (AIJ, 2005”: 73)

The concept is also in line with Birkeland’s calls for ecological spaces to be integrated vertically and horizontally in built spaces. (Birkeland, 2008b: 6)

Another feature of Bruwer’s homestead is a series of natural swimming pools and ponds decked with floating water plants to protect from algae, to help clean the water and for aesthetic appeal. The purifying water system filters down through the pools to a lower level in the garden, where a large vegetable garden is in construction. Currently, a deep-trench vegetable garden on a higher level is a natural way of building up the entire South corner of the land – around which a horse-shoe shaped house is half built. The garden is designed to maximize Northern sun exposure, a heat-sink aided further by a wind-protecting tree-belt/hedge to the South East. The hedge also serves as ‘white sound’ against distant freeway noise and a recursive winter biofuel source.

Photographs 2 & 3: The deep-trench vegetable garden and top “swimming pool” with floating water-purifying plants.

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His preferred building medium is earth construction - traditional cob and adobe - and the use of other “timeless vernacular technologies” - thatch, stone and rough hewn hand-treated timber.

Other than a hydronic (sun-warmed underfloor water heating) system, there is little in the Bruwer compound that struts advanced technology, and it is design capacity that integrates the household. There are composting toilets and composting areas, while all living matter, from tree cuttings to weeds to house water – is re-used – either to build the soil, construct more dwellings or water/mulch the garden. No water - harvested on site or purchased - ever leaves the site.

Bruwer describes ecological and organic architecture as a “fraught” concept, because every “fact-bound” definition “short-changes one or more aspect of the whole”. For him, above all, “organic” means “living”, whole amounting to much more than any sum of parts. “It is a most difficult definition … anything that is truly organic is a Gesamtkunstwerk – like the human body - where the total has potential to be more than the sum of the parts”, he explains.

_Gesamtkunstwerk_ was a concept of “total art work” that featured in the work of artists and musicians like Wagner and Mahler, one which encouraged the refinement of “emotional responses” and gave shape to “hidden dream states”. It also informed the design of theatres in the “German Romanticism and Naturalism” styles which emphasized integration of “elements of performance” and “colourful frescoes closely integrated with the architecture” in Central
European Baroque art. These were often “overwhelming” in scale representing a synthesis of painting, architecture and sculpture in a “single, unified and harmonious ensemble”. (http://www.britannica.com/EBchecked/topic/231963/Gesamtkunstwerk 16 Jul 2009 10:32:08 GMT)

It is often the social science aspects of how the building comes into being that is important, Bruwer stresses.

“For me sustainable architecture is a much newer thing than organic architecture, because what happened during the industrial revolution is that classicism and romanticism split and the Romantic Movement more or less died. Le Corbusier (Swiss French architect and designer – a father of Modern and International Style architecture in the early 1900s) and the Italians kept the rationalistic stream alive, which of course works perfectly for industrialisation because it is all squares and press out shapes by factories, while other forms of life were suppressed…along with the other more living artistic stream (of design).”


For Bruwer, ecological architecture embodies female energy and he rejects the hierarchical systems on which current capitalist trajectories depend:

“A lot of this has to do with gender. You find that men do not want to touch clay. In Mfuleni (Paarl) when we build, the men hang around with overalls and gloves, and the women roll up their sleeves and take the clay and build. In Africa, 50% of buildings - the sustainable ones – are built by women.”

And

“If you look at gender, in the early modern movement, there were many female architects. It is very interesting to see how integrally they thought …and then either
lost ground or were co-opted, to ‘think like men’, in which ‘success’ is driven by ‘solutioneering’.”

A study of the role of women architects during the last 100 years would give an indication of serious one-sidedness. While 50% of architecture graduates are women, most remain well below the radar in what remains largely a ‘white boys club’, says Bruwer. He has come to appreciate the eco-feminist perspective because he perceives the industry as exceptionally one-sided and gender-exclusivist.

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Photograph 4: The bottom “swimming pool” above the existing living quarters and next to the offices.

This is particularly enhanced when it comes to “evirotech” – “all the bells and whistles”, which Bruwer deems a “cooption of sustainability and increasingly will sideline it, and defer the deeper issues”.

“There are countless many sustainability salesmen trying to sell must-have bells and whistles. Architects become mainly specifiers of catalogue goods, and are increasingly being incentivised economically to do mainly that. Solar panels designed for Shanghai are installed here by untrained plumbers often losing efficiency in 18
months. Enviro-consultants spend their lives trying to resurrect dysfunctional systems which are over more simply technologically inappropriate.”

His approach to energy is also not premised on high-tech appliances.

“Many of our designs don’t use electricity where its use is non-essential, anti-social or anti-atmospheric. For instance, in the bath alcove or at a dinner table, a candle is simply more appropriate. If you right size fenestration and have enough light, controlled in simplest form (a shutter), use a hot box to make slow food, and consume fresh produce requiring no refrigeration or packaging, energy needs shrink to become almost insignificant.”

The 1996 voluntary Simple Living Network “is about living an examined life – one in which you have determined what is important, or ‘enough’ for you, discarding the rest.”
(http://www.simpleliving.net/main/)

Bruwer maintains that residential built fabric should primarily minimize dependency on materials and technologies developed for industry. Hi-tech has most of its raison d’etre in the “martial and male dominated” paradigm. A question about ecological construction materials turns into a philosophy about the link between building and livelihoods:

“Anything that has been pressed out, that is flat and that is baked hard, densified beyond its optimum requirement, deprives us from doing something artistic with it. All things industrial co-opt or arrest further human creativity. That is why we loathe it so, whilst drowning in its degrading discards. In contrast, a good example of the alternative is earth construction; if I mine soil on a building site, using my senses - nothing more - to analyse and prepare the material, and typically import a small percentage of clay from a nearby source to make earth construction possible. That is all you need. The rest ‘happens as social and educational capital.’”

“By contrast the whole industrial revolution is about fire, heat, smelting and pressure, mass production and taking human participation - engagement, belonging and process ownership - out of the equation. This is the basis of the whole martial male dominated trend since 1850 in the world - heat, pressure and compression…As soon as we make anything that is harder that needed for its purpose, you use more
embodied energy – and more importantly, you dehumanize, deprive humans of that value adding transformative/participative process.”

“On top of that there’s the deprivation that sees 40% of unemployment in SA... You have building techniques that use machines and factories... and no jobs. This is manifestly a symmetrical problem. The government simply cannot talk about job creation and then primarily support the use of large machinery to do grand projects .....it is antithetical, it does not go together.”

Bruwer says the South African building industry highlights most of the social consequences and problems created through unnecessary/inappropriate embodied machine-energy use in capitalist systems:

“If you think of what it takes to make one sheet of corrugated iron; iron ore from Sishen shipped to Langebaan and Shangai, then back to be galvanized and polyester-coated in Vereeniging, then railed to the Cape, then rolled into corrugated form, redistributed ...with a large percentage wasted in of-cuts. All of it again needs enormous energy to recycle. As a bang for eco-buck system, that is insane - even before you calibrate the consequences of living in non-insulated tin in the shack towns.”

“So there is for me a strict symmetric relationship between our social capital and making people into surplus.”

Bruwer does still use conventional building methods, primarily because clients struggle to find loan capital.

“Our building regulations are totally disabling of anything organic or low embodied energy. The National Building Regulation Council is totally anti-green and anti social capital...The Green Building Council is also silent on lower technology and social capital. It is all about triple glazing and stainless steel, 100 story houses, - the engineering approach to architecture, which will make for ever more environmental indifference.”

In terms of the Seven Senses framework, Bruwer is an example of an architect that is realizing the potential of “sustainable construction materials and building methods” and the designing for “zero waste via re-use of waste outputs as productive inputs and “sustainable
“water use”. He has not applied the re-use of treated sewerage widely because there is a resistance among his clients to the concept. Bruwer is personally not sold on the technologies for renewable energy as a primary consideration, although he is not opposed to it. He maximizes energy efficiency in his designs. He has not worked extensively on the concept of sustainable transport, and as we will see later.

2. A sense of History – This “sense” could be read in the context of Birkeland’s argument that ecological design can heal and that it should “expand the public estate in net positive ways” as it does the ecological base and that a precondition for such positive outcomes would be systems and structures that are participatory and democratic. (Birkeland, 2008 b: 5)

Stellenbosch-bred Bruwer became an architect after he read Ayn Rand’s - “The Fountainhead” – loosely based on organic architect Frank Lloyd Wright’s life. At the age of 13 he decided he would have to become one, even if he had to starve. Two studying stints in America brought insight in the emerging practice of organic architecture. He started his career with a bursary that put him squarely in the middle of post 1976 township tensions, burning with a drive to build “community” centres.

“There were a few old white boere bureaucrats still planning townships who appreciated an enthusiastic young laaitie…so I started building all these community centres. I usually spent nine months with a community before starting to execute the design. Other architects would not do it, because it is was not profitable.”

He said his approach was organic in that he also went through all community audit processes to discover what they needed, but still felt he did not have the template to design in a fully organic way.

“I went about it conventionally. I used hard industrial linear materials, but tried to soften it …I needed to break a lot of things before I could soften designs. So there was a conflict - between a holistic conception that said it should be organic, all parts and limbs should be part of the whole body and in the full sense of the word should be part of the community, representing all parts of it in such a way that you can talk about a higher aspect of the community – and if you don’t take something from the
community and build it in … then it is just another anonymous, Godforsaken military-industrial roll-out.”

He said we have appropriated an industrial aesthetic for community buildings – and now also green buildings - based on what had been glorious in 1923, in “Meccano- industry buildings”.

“Often so-called green buildings are just industrial sheds with token slapped-on mud and labeled sustainable …(but)…it leaves one cold as any other. As a spiritual experience, the machine aesthetic of the mechanical-industrial style is fundamentally misappropriated in sustainability.”

In the main, then, Bruwer’s approach broadly overlaps with that of Birkeland – in that ecological design and building can address social problems. He goes beyond mainstream “green” approaches to address systemic issues.

Photograph 5: The children’s quarters, built by the family.

Bruwer roughly follows the same path as architect Andy Horn who’s 1998 “Manifesto for Green Architecture” highlights six principles including “processes” use local materials and skills to create jobs and limit embodied energy and transport costs; “Symbiosis” with local environments and resources; “Holism” by intrinsically interconnected design and building and “Healthy materials” to ensure a non-polluting living environment such as wood free of toxic treatments. Horn describes nine features of design that are key in promoting socio-economic and cultural advancement, including a sensitivity for local history and its materials, skills and vernacular patterns, “a sense of place”, the “health of builders and occupants” and the provision of local jobs. (http://www.bcn.ufl.edu/sustainable and
Unlike Horn, Bruwer has not specialized in restoration of vernacular buildings, but has participated in a number of projects, amongst others in the old missionary stations of Packaltsdorp, the oldest settlement in the George District, and Ebenezer. Bruwer restored some of the first sod houses in Packaltsdorp which he said was “wonderfully rich” with vernacular history, and over a hundred years old.

He says many Cape Dutch homes have been severely damaged by modern cement based restoration, which has been added to its soft clay. He shows photographs of new clay compacts are made – like adobe – in ice-cream containers and retrofitted where the cement had been removed.

One component of culture is often overlooked in South African architecture, he suggests. There is a constant need in urban centres for rural family members to be initiated into town living – hence the need for more granny flats.

“In mid and lower income groups’, lodger culture is very important as a good point of entry for people migrating to cities and you don’t want to dump them on the street. We need those halfway houses. It is about understanding urban African culture. So in
city blocks you should have entrance where you can park your bicycle and then a landing with the lodger door and then another door for the house….and a space for washing. “

As to why RDP houses cannot be cob houses, Bruwer says that developers do not see it as profitable, because they “all gated communities are driven by security concerns, which in turn is based on anonymity” and that RDP communities “must look like” proto-gated communities to placate the users. However, he does believe that all social building projects should be based on the aspirations and the needs of the community. “That is the big missing chocolate of all the Eurocentric sustainability, which harps on about energy, whilst we should be looking at social capital created through environment-making”, he says.

Ecological design highlights the community dimension of design, such as promoting “traditional knowledge of place and local materials and technologies”, fostering local commons as well as biodiversity and its synergies with local cultures and economies. Van der Ryn & Cowan insists that instead of expert design decisions, there should be “commitment to clear discussion and debate” with communities, which should be “empowered to join the design process”. Nature and culture should be viewed as “potentially symbiotic”. (Van der Ryn & Cowan: 1995: 27 - 28)

As an ecological designer and “facilitator”, Bruwer’s work promotes a “sense of community”, a “participatory culture” and “cultural diversity”. He also strives towards “healing and memory of place” as the next section will show.

3. Sense of Justice – Birkeland believes that architecture could help address systemic problems that amongst others lead to poverty and over consumption. She blames the trends on a Pyramidal design System in which the environment and the poor pay for the price for unsustainable inputs. If we can change the paradigm to Positive Development we can meet intra- and inter- generational justice through design. (Birkeland, 2002: 14 – 15)

For Bruwer the concept of ecological design has a marked spiritual and transcendental dimension that is hard to pin down, but he firmly believes that South Africa is the country that will be able to make the leap to a more sustainable paradigm.
“When I discovered Lloyd Wright and other organic designers and builders, I realized they have another level of knowledge – a holistic concept where there is something about the whole that is more than the sum of the parts...but it remains a challenge. And it is just as difficult to preserve something sustainability in a holistic way as it is to bring it together...and then add client politics, the engineering principles of green building techniques ...it’s difficult, but the most important is to bring to it a vision that says the human must be able to experience it as whole.”

Lloyd Wright, a father of modern organic design, said: “‘Think simples’ as my old master used to say – meaning reduce the whole of its parts into the simplest terms, getting back to first principles.” And “All fine architectural values are human values, else not valuable.”

(http://architecture.about.com/library/bl-wright-quotes.htm)

It links with the view of Van der Ryn that where “nature and technology are hidden”, the design “does not teach us over time”. Instead nature and technology should be made visible so that the design can pull people “closer to the systems that ultimately sustain us”. (Van der Ryn & Cowan, 1996: 28)

Bruwer believes there should be a link between the moral and aesthetic.

“You can only achieve this if people discover themselves within the environment, when the human is abidingly embodied in the conception, making and living of the manmade, a palimpsest.”

A palimpsest architecture can be “sensuous, tactile and tectonic” composed of “layered spaces” or represent “multiple overlaid scripts” that give form to a “meaning greater than the sum of their component parts” with hints of a past – thus a creative application for re-cycled buildings and a metaphor for “nested layers” of ecosystems in the urban fabric. (AIJ: 2005) It talks about the use of something of value to renew something discarded. It is about a shelter, not just for living, but also as a symbol of its past and future relationships. The word comes from scraped clean or washed papyrus documents – the recycling of original writing sheets – where former imprints were still vaguely legible. Heretic texts were often overwritten creating a ghost of the past showing through the new truths.

Bruwer tells the story of a palimpsest at the Guguletu Community Centre in Klipfontein Road which he built in the early 1990s. It is a story about healing and protection:

“I made a big building, with a large ring wall and I was the only white person there for miles. That morning, the electrician arrived with a new bakkie and the toytoying people stoned him, he bled. There had been protest placards mounted all over the walls, saying ‘occupy the city’. Then it turned noon and the children walking home waned me to leave. ‘It will get hot, get out’. I took the posters off because we needed to plaster the walls, we had to finish, stoning or not.

But we also needed to protect the building, I kept thinking, and then I asked the younger children hanging around to take hands and stand around the walls, and we chalked their profiles on to the walls and plastered these in. They are still there today, an example of a way of humanizing a pretty godforsaken industrial world. Those youngters are now grown up and at times come to show friends where they stood. From that day on, it was hands-off the building.”

At a youth centre, later, I did hundreds of clay casts of the faces of the children to surround the walls with a guard of honour, for protection.”

While the community was not allowed on white beaches, he personally picked up car loads of white stone pebbles to incorporate into its offices through a mix of plaster processes, “bringing the forbidden beach” to the people, symbolically.

In *Greenprint* magazine the project is described as typical of Bruwer’s “building with soul” – “an attempt to reconcile the formative principles of metamorphosis and sacred geometries with the ‘green’ agenda in a buoyant, dynamic way”.

“Working with natural materials such as cob and strawbale, and following an aesthetic directed by anthroposophical principles, his buildings are organic yet practical, sensuous yet functional. Working in community architecture, Etienne’s playful workshops’ encourage communities to work together. In that way, the process of building also helps to restore balance and harmony within them.” (Greenprint, Vol. 1, 2006)
He says that all the solar panels and job creation schemes in the world won’t work if there is not “a human-aesthetic component”.

“Sustainability is about social capital, people, not dispassionately about the environment.

“Despite the wonderful balance of the triple bottom line approach, it is still a capitalist paradigm, to think you can just balance by getting your equities right between three spheres. If there is no vision, renewal, substantial aesthetic dimension, it won’t work.”

This is in line with Birkeland’s critique of status quo and existing paradigms of sustainability, which argues that these approaches often perpetuates themselves and rests on negative attitudes to the environment and a continuation of the growth and design patterns set in motion by 20th century consumerism, corporate inters networks and particularly the military industrial complex. Current eco-design approaches rarely depart from the “triple bottom line” to give expression to the “interconnection of environmental, economic and social factors”. Cities meanwhile remain “defined by and through consumption”. (Birkeland, 2008: xvii & 10)

“It is, after all, the status quo that represents social, political and biophysical change at an exponential rate – in the wrong direction. The military-industrial complex anticipated by President Eisenhower in the 1950s and the ‘corporatist’ state that took hold in the 1980s, have imposed one, largely irreversible, pathway. Environmentalists are no more fearful or irrational than those who choose to live in a military industrial complex.” (Birkeland, 2008a: xvii)

Bruwer believes South Africa can set the tone in Positive Development, creating more than just a sense of justice:

“For me sustainability is indivisibly holistic, therefore so difficult to penetrate. The organic methodology is indivisible from sustainability. High tech SD is not sustainability, especially not in South Africa!

“We are here to develop people, and we have all the complexity in the world, the ideal incubator to score big in social equity, to cross the karmic divide between environmental and economic inequities.”
But – we are not taking up the challenge - and it may take another generation for ecological design and practice to make sense of social and aesthetic dimension and to become ingrained in general practice, he says.

Bruwer believes vernacular and organic architecture is a sufficient basis for meeting fundamental human needs – “subsistence, protection, affection, understanding, participation, creativity, identity and freedom” - but that an “essential satisfier” is an aesthetic dimension that is firmly linked to an ethic of sharing and protection. He is not a rights-based activist, but firmly believes in democratic participation models throughout the design and building processes.

4. A Sense of Craft – Africa has a rich culture of vernacular and sustainable design, but it has high unemployment and perhaps the poorest and most unequal region in the world. It is preparing to enter its urban age with its urban population estimated to double in the next twenty years. There is a need to rescue and revive some of the vernacular traditions to integrate the wisdom into sustainable design and create social capital in the process.

In order to create a Sense of Justice in South Africa, will mean not only correcting past wrongs and rebalancing inequities, but also to ensure short-term livelihoods. At heart, Bruwer’s work is about imparting skills. He laments the fact that most of the foreign funding available for such programmes come with “long strings attached”, while construction job creation by the government often use conventional resource-intensive methods, rather than building on empowering vernacular skills.

Bruwer says in the context of keeping vernacular human skills alive, he looks for inspiration mostly to Egyptian architect Hassan Fathy, who at large scale started “a new social cult of self help” becoming the “most-built architect in world”. He built only with mud even though he constructed whole cities and grand buildings with domes - with mud bricks – “the arm of the mason fixed with a line, so that he always builds in the same circle”.

Born in 1900, Fathy worked tirelessly for “appropriate technology” in building and brining back the adobe brick traditional-based and even ancient methods of design, while teaching
both local builders and at university. His working life spanned 160 projects, including fully fledged towns, while he researched a program of “Cities of the Future” for Africa and wrote a book on “Architecture for the Poor”:

“He integrated knowledge of the rural Egyptian economic situation with a wide knowledge of ancient architectural and town design techniques... Climatic conditions, public health considerations, and ancient craft skills also affected his design decisions. Based on the structural massing of ancient buildings, Fathy incorporated dense brick walls and traditional courtyard forms to provide passive cooling.” (http://Wikipedia.org/wiki/Hassan_Fathy)

“And then there is also Hungarian architect Imre Makovecz, a very big ego of a person - in his 70s now. Throughout the whole communist period he found a way to get his hands on community halls budgets and worked with communities, primarily to build with wood these unbelievable buildings an so rescued the entire craft movement from demise”, says Bruwer.

From the late 1950s Makovecz became a proponent of “organic architecture”, trying to work with surroundings rather than imposing buildings. He was influenced by Lloyd Wright and Steiner as well as “traditional Hungarian art” such as Art Nouveau and National Romanticism styles of the country in trying to break the “brutal uniformity” of communist architecture. (http://en.wikipedia.org/wiki/Imre_Makovecz on 9 Jul 2009 05:47:09 GMT.)

“The central point for me is – for me sustainability is an indivisible, holistic concept”, says Bruwer.

A key part of Bruwer’s practice is social sustainability - “training green construction skills in communities, essential in delivering the empowerment component of the social-economic-environment triple-bottom-line triad”, his website states. “Via inter alia skills census and local-resource audits, we determine labour availability/unemployment rate/gender&demographic profile, resource base and hierarchy of needs – then analyse infrastructure/human development/capital requirements. We locate local craft skills and practitioners where such survive – then offer top-up/new skills-training in the methods and building techniques deemed appropriate to context.” (www.sustainablebuiltenvironments.com; http://www.greenhaus.co.za/training.htm)

He has participated in a government project to build Multipurpose Resource Centres along the coast, which involved Coastcare, Ecoafrica and Working for Water. He says through the
project, the government also paid people to help keep beaches clean and teach them sustainable skills simultaneously.

“I subcontracted and we did audits for communities all over the country - a needs assessment. We then built clay offices, used for for one-stop email and other community services. It was wonderful to do the audit, finding the old people who still knew how to build sustainably. So we could still mine skills. We needed them to obtain autonomy and sustainability - with business skills.”

Offices in Elands Bay and Doringbaai were among the earth and clay based constructions.

“Every building was unique. People took part in the planning. The idea was not only buildings but a tourism route….so that tourists will be a one day trek from each guesthouse to the other and combined with all the regional cuisine and fish culture, providing jobs for tour guides so that after creating construction jobs, there would also be a community. The point is that sustainability is not an off-the-shelf product.”

Bruwer’s call for a change in the way we design and build to ensure sustainability is consistent with Van der Ryn’s argument for a change of culture in how we design to allow new ways of thinking about the process of design, to enable us to weave harmoniously together new technology and “the cultural foundations of sustainability”.

“Ecological design is a way of integrating human purpose with nature’s own flows, cycles, and patterns. It begins with the richest possible understanding of the ecological context of a given design problem and develops solutions that are consistent with the cultural context. Such design cannot be the work of experts only. It is ultimately the work of a sustainable culture, one skilled in reweaving the multiple layers of natural and human design. Ecological designers are facilitators and catalysts in the cultural processes underlying sustainability. (Van der Ryn & Cowan, 1995: 25)

In one project, he taught 600 people to cob. The house was built at Beaver Lake in the Cederberg for two “strong feminist” women.

“It intimidated some of the male builders. This scrambles one’s preconceptions and stereotypes about what women and men are. And I came to a much more nuanced understanding of what gender is in the healthy sense, a kind of complimentary
process in which you can complete something in yourself….of what is male and female …and there are things that women and men do better because it is in their true gender nature. “

SA Country Life magazine describes the house as having “an extra dimension” – “an energy of consciousness and coincidence” and the “unpredictability” that comes with building “by instinct”:

“You can feel this house breathe, so content it is in its setting. So content in fact that baboons have felt free to come and play on the domed roof and the spoor of creatures great and small occurs all around it.”

Amongst its sustainable features are “ceiling cladding” made from “packing case rejects”, a solar panel, plastering made from “clay, sifted sand, donkey feed and linseed oil” and borax treated wood.

“The house however, is not infinite”, says SA Country Life. The owners say they are just “stewards” of the building. “But when our time is up, the house will revert back to the land – which is just as it should be”. (SA Country Life: January 2006)

There are constraints in taking ecological design to urban centres where it can create much needed jobs.

Bruwer’s most recent work is a house right in the centre of Muizenberg’s historical neighbourhood, unlike much of his work in rural and peri-urban areas where unusual designs could more easily integrated into the environment and “where you could smuggle the plans through or make allies from buildings inspectors”.

His Muizenberg clients did not have money and struggled without any significant success to obtain a loan to build their eco-house. Another constraint was “a hysterical Historic Monuments Society that only wants to see broekie-lace buildings”.

“Even though there is a lot of stone in the building – and the buildings around had a lot of stone - it needed the local Municipality to make a head shift. Another problem was they could not get a bank loan because green building resale values are untested waters. This is despite the fact that Gaudi’s Barcelona buildings now have five times the market value over their replacement value!”
Browbeating numerous objections, persistence reaped rewards, and the corner clay house with a view of sea has become a “beacon of inspiration” for those coming to attend plaster and cob building workshops on weekends. The house is nearing completion after three years – the time it often takes to build with cob and no money – and according to Men’s Health magazine “looks quite at home in the area”. The magazine found that cob houses could be built for around R3000 a square metre, with labour the largest input. The cob mainly came from salvaged earth “that was on its way to the dump from a building site” as well as re-using the soil that was dug for their house’s own foundations”. (Men’s Health Living, November 2007; http://cobhouse.blogspot.com/2007/03/now-its-down-to-earth-in-muizenberg.html. 1 Jul 2009 17:24:02 GMT.)

“We made a building that is very modern – but not as in glass boxes with steel rafters dressed with a few token reeds - and those seriously flat upright stone walls that look like wallpaper, so in vogue now. They look like a child being scolded in class.”

Photographs 8 & 9: The Muizenberg cob-house gets an arched roof

Throughout the building features mostly organic low embodied energy materials, such as support poles from alien wood bought from RDP projects, holding up a triple-conical roof with bent beams, from another sustainable source.

“So the fact that the owners built themselves, the fact that it was within a community and there was great skills transfer, was satisfying. Now my cob teams have set up their own business…where they work for independently for clients and others, in Hout Bay, Muizenberg and Kommetjie, employing themselves.”
“In my workshops and in Muizenberg, I threw together workers and doctors degrees …and then you get wonderful social capital formation, the working together becomes an equalizing process. I get big satisfaction from workshops, throwing these opposites together…”

Bruwer’s work demonstrates transfer of “human skills, knowledge development and continuing learning” and efforts to grow the local economy. Sustainable skills transfer also means growing food locally, especially in rural areas where other opportunities are scarce. The underlying design paradigm promotes greater equity and therefore points the way towards building with “a sense of justice”.

5. Sense of Nature – Birkeland advocates that Positive design can “actively restore the indigenous ecology, integrating and increasing ‘ecosystem services’ into development, the fostering of ‘natural habitats and biodiversity within urban areas as in bioregion as well as buildings. (Birkeland, 2008 b: 1)

Bruwer’s own homestead is based on Bill Mollison’s permaculture concept, which he widely advocates. He believes it should go further to heal wounds, He cites the example of a friend who not only practice and teaches the permaculture and holistic management concept but use it to mediate between generations on farms – between father and son and between farmers and workers – to improve the “karma of the family, the economy, of the farm, helping them to talk”.

His own bi-annual conferences on sustainable building shows up another divide – that between the two physical elements in nature – Earth and Water and the non-physical, air and fire, which Bruwer sees as significant.

“The permaculture people work with water and earth, I work with water and earth. We start (conferences) by dividing one straw bale in two…and through the whole process we visit each other, because everything in the end is about design… your yard lay-out, attitude to urbanity, to peri-urbanity, to cities.

The energy-workshoppers fly in with ties and laptops, just pop in and out. Why? They don’t touch anything, they work with air, light and fire, but we work with the
tangible elements. So there is a sensuous quality, as soon as you work with the four elements and bring them together in the right way. Whatever you do, there is contact, integration… it is indivisible, and you cannot do the one without the other.”

He says someone who sits in a sealed steel and glass aircon building on the 18th floor cannot be expected to understand sustainability – “because they can’t live it…**there is an alchemy that happens only when you participate**”.

“The old craft architects, from the first consultation, would call together everybody ….those who work with wood, make the tiles, those who work with steel - it is a think-tank from the beginning, because of everyone’s inputs about how to transmogrify and put together something. It is an artistic and aesthetic process. **And I think the relationship between the aesthetic and moral is the most significant part of it. All knowledge comes from doing. All experience leads to knowledge and without the factual experience you are second-guessing the knowledge-hence architecture has pre-eminently become graphic design, desktopping.”

Bruwer’s work demonstrates a dedication to life and the “preservation of natural habitats” through participating in it, “working with rather than against eco-systems” and “enhancing biodiversity” that underpins Positive Development and its thesis that humans can continuously improve nature to leave it better for future generations.

6. **Sense of Viability** – *This sense could be read as a sense of the future, optimism about possibilities for improving the vitality of nature while we experience our second urban shift. This means that we need to think carefully about all design concepts and make development “reversible” where we don’t need the outcomes so that we don’t burden future generations.* (Birkeland, 2008a: xxii)

I ask Bruwer whether densification as a key concept of sustainable cities is in conflict with organic architecture and ecological design principles. He will only entertain it in the context of a bioregion. The answer is long, but he does not opt for density as a viable strategy to enhance nature.
“For me regionality as concept is based on a very broad understanding about what the city and urbanity means. It is about how well you do your resource audit about the area’s carrying capacity and what you have to import or barter to keep the balance. I broadly locate a community in a ‘sphere of impacts and effects’, then find out what skills people have, how many empty hands there are, which skill survive, also see what the landscape offers, waste streams offer, and then map all to find a kind of prognosis. This enables you to find a way of pulling together resources, mitigate your imports, factor embodied energy to max out human content, and obtain balance. You must look widely at the social and the economic and the environment.”

Bruwer tells a story of a special kind of audit:

“I knew a sculptor and potter in South America. He went to the favela’s Argentina, where the people are allowed to squat. Once a community had formed, the infrastructure was laid on in situ to create work and then they are proud of it because they have suffered for it, and made it themselves. When a new road was built with the area’s red clay earth, he scraped a layer of clay off the new road-cut, baked it into bricks and then went back and built these back on to the same road cut, with mud mortar. As people passed, they took baked bricks home— a rare commodity in Comodoro Rivadavia - used to these to enhance and improve their dwellings. The bricks had been numbered and could thus be located. When all the bricks had been taken by the community and ‘re-deployed’, an audit showed how far the ‘spiritual sphere’ the process of community building extended from the original location.”

Van der Ryn & Cowan stresses that ecological design is premised on sophisticated ecological accounting methods covering “entire life cycle” of building projects, stressing the compatibility of economics and ecology, designs that integrate buildings with the bioregion with “solutions that grow from place” – while working “across multiple scales” yet work with “whole systems”. (Van Ryn & Cowan, 1995: 26 – 27)

Bruwer argues that there is no such thing as densification unless you think in “wholes, clusters and neighbourhoods’. There no such think as a ‘sustainable light bulb, or sustainable house…sustainability is not a property that exists in a stand-alone object like a house of light bulb or solar panel”, but about recursivity of practice, humanization, connective tissue between things, cohering …”, he says. This seems to stand in contradiction as Birkeland’s thesis that we can design buildings that are mini-ecosystems, as in the ANSI project.

(Birkeland, 2008: 3)
“Not with all the might in the world can you make an atomistic, single, independent individual sustainable house as a function of profit. It will only work in community, where people work together and if there is a kind of working together between homes and the materials are sustainable. I think we are seeking for a new paradigm, weaving between the man-made and the green or agronomic. But we must have a social ethos. That is why Latin American settlements work. Because people are first allowed to form a community… a desperate one and then they insert services that give them jobs. The human content must be organic, hence incremental, resilience building, community building.”

He believes that indications are that the new Green Building Council will “take on an Eurocentric approach”.

“We are seeing 70 storeys high buildings of steel and triple glazing that look like ice sheets going up in the Arabian Desert, all in the name of sustainability. But are we really supposed to build 50 storey buildings from titanium in the middle of the Arabic desert? Sustainable means people never losing their relationship with the earth, as you do the moment you live more than five storeys above the earth. When you can’t walk up to your house anymore, there is a separation, you lose eye contact with the ground and people...there is a disowning process, also during the building process.”

He says the kind of buildings developed in the US in the last 100 years as a result of steel construction and created the ‘canyons of New York’ is part of the dilemma.

“The only buildings higher than that are marginally sustainable, are in Yemen where ten stories high buildings are built from metre thick cob walls at the bottom - and the top story is limed white to protect against rain, a white crown.”

Shibam in Yemen is a small town that has its origins around the 2nd century AD and is a UNESCO World Heritage Site – the site of the world’s first “skyscraper” and the “earliest example of urban planning based on the principle of vertical construction”. All the houses are built from mud bricks, including about 500 “tower houses” of up to 16 stories high. Most of them have been rebuilt over and over again since the 16th century and are still the world’s tallest mud structures. They were built high and dense for protection from outside attack. (http://en.wikipedia.org/wiki/Shibam)
“The other example which I find beautiful, the Hakka people in China who build social communal housing, shaped like a donut – big, round buildings with big courtyards in the middle, all from mud, in a beehive form, the roofs from palms, productive land around.”

The unique earthen buildings – combining domestic apartments with a fortress structure - were erected from the 17th century to “withstand protracted siege” with grain storage, internal water sources, ancestral temples and “sophisticated sewage systems” in the middle of the round shape. They are usually not taller than two stories. It also has World Heritage status. (http://en.wikipedia.org/wiki/Hakka_architecture)

Photographs 10-12: Views of Shibam’s “skyscrapers”.

Bruwer says that you cannot talk about urban matrixes that are void of biomass (alive) unless you say you understand community of trees and biomas as integral part of development. Urbanisation cannot be designed for healing “unless 20% of all uncluttered un-built space will
be devoted to food gardens, and wind breaks and sound barriers …and green strips for pollination, biodiversity, recreation”.

“So densification makes sense only if there is a true mix of communities – buildings, people, plants – when we make a yard where we can see each other and the children can play, we will always be building gated communities. Our biggest problem in cities is the disowned public space, the tragedy of the commons, and our sense of community is disaggregated and atomised.”

It is worth noting that Trainer (2002) too argues that within a society where growth may slow due to resource scarcity, density may not be a permanent solution:

“The problem with this view is that it has only taken into account consumption issues. Increasing density will undoubtedly reduce some of the per capita costs associated with providing goods and services for household consumption. However, sustainable settlements must be highly self-sufficient in production, and this requires space. The more that cities increase their density, the more they reduce their capacity to provide for themselves and must increasingly transport goods in and transport wastes out… The ideal balance is most likely to involve a mixture of small, relatively dense centres surrounded by low-density settlements and areas that are made up of farms, forests, commons, and nature reserves.” (Trainer, 2002: 34 – 35)

Bruwer believes that in the discourse on sustainability we are neglecting design of “connective tissue” between spaces, humans and nature.

“It is an indivisible thing …it is about better wholes, it is not about one variable of it… sustainability is all about connective tissue, and the spaces between spaces…and these should be a point of focus for the whole sustainability discourse …especially when we talk about densification. What do you insert, where do you intervene, where do you beef up what is there, where do you alter in total what the mix would be? It is not about a little box that you profitably put together so that energy use is less…”

In addition to a resistance to skyscrapers and compacting, Bruwer believes buildings should not be forever.
“I think the form-ability of matter is a much bigger gift. Clay is sustainable in the flesh; you are not putting more energy than necessary into cob, so the deconstruction does not lead to waste. We need to embrace the cradle to cradle concept.”

Birkeland also advocates that where we do not understand the implications of design - particularly given the complexity and unpredictability of climate change – we should tread carefully with permanent structures.

“Where we lack the design capacity to expand the range of substantive life choices available to present and future generations (while preserving wilderness), we need to make development, land-use and resource decisions that are ‘reversible’. ” (Birkeland, 2008a: xxii)

Bruwer notes that a city like Pretoria is typically “renewed” every 26 years on average, due to the need for new spaces, bigger buildings.

The Greenhaus design paradigm provides for a sense of possibility, considering the “social and ecological consequences” of building. Often forgoing profit, it is meant to rather “enhance the social and ecological viability” and considering the long-term sustainability in all functions of the “process” of building. He considers the fact that there are “opportunities that current actions cannot necessarily unlock “and therefore argues against made-for-forever permanent structures” to create future viability.

7. A sense of place – A sense of transcendence

Ecological design occurs in the context of specific places, says Van der Ryn and Cowan.

“It grows out of place the way the oak grows from an acorn. It responds to the particularities of place: the soils, vegetation, animals, climate, topography, water flows, and people lending it coherence. It seeks locally adapted solutions that can replace matter, energy, and waste with design intelligence. Such and approach matches biological diversity with cultural diversity rather than compromising both the way conventional solutions do.” (Van der Ryn & Cowan, 1996: 23)
On design intelligence, Bruwer says that a series of buildings he is constructing in Barrydale are architectonically his best examples of this rootedness. He had freedom to design and spend as was best for the project. Of these, his favourite is a cellar – called the Karooltjie Kelder – which he could design not only with the environment in mind but also social principles.

“I could work there with simplicity of means and design, with proportional systems and the right juxtapositions between that which is massive – the walls – and that which was more spinal – the columns. This economy was a wonderful challenge. I put a roof in the middle and on the sides; there are thin columns that cross each other at that point (where they support two roofs).

“The proportions are based on musical harmonies throughout the building, scissors that cross each other. People who use the building – for theatre and yoga classes – experience it as beyond the physical. I therefore think sustainability is not just a green technique.

“Oh, unless architecture becomes a social science and art form again, that link between the aesthetic and moral will not return. The fact is that all that is aesthetic comes from the ethical means the role of the architect future perfect is to find new metaphors, new imaginations of the world.

“And unless this search for a true organic holistic architecture is healing, unless we understand the healing content of design, the possibility of facilitating a better world is just a big lie. It will be just another Newtonian calorie count.”

He says the time has passed for square buildings because boxes no longer add to our conceptual wisdom and development.

“All right angles retard our operations, puts us in a box, then we may as well make container houses. But something starts to live the moment you use an angle larger than 90 degrees. It creates space. The whole ‘potentialisation’ of space has to do with geometry and design, but universities no longer teach that or the social principles. It is just research with answers from engineers and fear mongering over carbon imprints. But engineering is all about substance while form is all about meaning and Goethe said about the tendency to form and the tendency to substance
…it is only when you can bring them together in play that you can get another dimension of the new. Aesthetic education is lacking.”

This approach also means a critique of Birkeland’s Positive Development approach as far as Africa is concerned. Bruwer says that In the African context, there are two primary prerequisites for ‘sustainability’: 1. the building must be designed integrally and 2. made and used integrally through building social capital.

“By definition then, technology should always remain secondary to attitudinal transformation. Put it this way, perfect indoor temperature and light may ‘help’, but only spatial quality and form can ‘achieve’ a humanized environment. In contrast, the current reality is basically the opposite, that most people want easily purchasable engineered solutions (solar panels designed for Shanghai), which results mostly in fashionable anti-architecture (steel cages hung with ‘vertical jungles’, and so on), none of which of necessity heals or enhances the human-earth relationship.”

He argues that ‘transformation’ is a relational concept, which by definition only ‘happens’ when it alters the human as much as it may alter the world. “As design has more or less become computer-driven graphic art, notions of crafting and making can only but recede from both the conception and the making of the world, and be relegated to the role of appliqué and décor (of flat-box form-anonymous spaces)”, he says. As a consequence, very few designers engage with human issues and causes, work with raw materials or add social value.

Photograph 13: A Barrydale cob-house with local stone cladding and a wooden outer wall.

The Barrydale project is also important because there was substantial transfer of skills in the building process.

“Any transformation implies a learning process, a transformation process, so while many find the skills transfer process to be just a ephemeral question of cost and job
creation. It really is about how this happens, how things are transformed. In Barrydale there are now 40 people who can cob, mostly women.”

He says due to lack of food and nutrition the energy intensive process of building with cob meant that there was only “60% efficiency at best” in the construction process. “But I don’t mind, I know they have learned skills that they can use to build houses for themselves or others.”

“It is the same as building with machines, but in cob you make the materials yourself. It is a different spending than in conventional building where it is all about transport and monopolies, cement bricks with massive amounts of embedded energy. So it is hard and cold and dead enough not to disintegrate in 70 years. We’ve created an environment of indifference…which is not only very unhealthy but we built an environment without human content. A world of ‘no-maintenance’ ‘no-footprint’ ‘zero-impact’ and ‘cap-and-trade’ is also probably mostly a world void of human engagement, passion and care. That is the world we are risking by advancing the cause of technology incommensurate with every other cause.”

“In Japan, Buddhist temples are purposely reconstructed every few years. How else might human beings retain, refine and transfer skills… and the gods be pleased? Surely, (it is) through deeds rather than though ownership …that the human returns to the human.”

Bruwer has been described as an architect “building with soul” and his designs noted as embodying a “sense of place”. He considers the health and well-being of builders, occupants and future generations and the creation of secure and vibrant communities.

**Conclusion:** I did not consciously choose an architect that shuns most of the “green” technologies even though I am very skeptical about their role in creating sustainability and believe that they may be used to perpetuate current consumption patterns.

In long conversations with Etienne Bruwer I discovered that design for sustainability is inherently a process of “facilitation” and transformation, of both current needs for living space, but also as a “catalyst” for future space and viability. It is a journey, a process of not only making space for now and the future, but of creating spaces in between for all living things to thrive. I believe that this is essentially a homebru version of a Positive Development
philosophy and this process should be considered before we jump wholesale for hi-tech interventions which in themselves may not be sustainable in our developing context.

In terms of the biggest challenges Africa will have to deal with in the next twenty years – catching up developmentally while battling the effects of climate change - may require us to leapfrog to new technologies, but this will only work if we have a strong basis that is appropriate and ecologically viable. Otherwise ‘green’ technology may for Africa mean little more than a phenomenon that enables high consumerist patterns to be perpetuated and inequality to be entrenched.
Bibliography:


