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Part III - Chapter 12

*Sustainable architecture assemblages*

***Authors: Maria Theodorou, David Turnbull***

***Abstract***

*The chapter is structured in three parts that use different entry points to approach sustainable architecture as a condition of a material assemblage that combines concepts, buildings, structures, educational and professional practices, political and financial conditions, global technologies, local technics, friendships, alliances, weather conditions and apparatuses of capture. Part 1 provides a thinking device for discussing architecture’s lively matter beyond the straitjacket of sustainability guidelines and questions the Siamese birth that ties sustainability to development. In Part 2, Waterbanks – PITCHAfrica case study unfolds the complex assemblage of sustainable architecture operations in Africa. In Part 3, both authors reflect on the architecture knowledge assemblage within which their alternative professional and educational practice emerged.* Can their experimentations with ATOPIA and SARCHA be understood as ‘sustainable’ architecture practices? To formulate differently the chapter’s main question: can ‘sustainable’ architecture be produced only within a different mindset that generates another type of practice and education?

 **Keywords**: Assemblages, materialism, ANT, sustainable architecture education & practice, PITCHAfrica, Waterbanks, ATOPIA, SARCHA.

Part 1: THESIS

***Architecture’s Lively Matter: A Thinking Device***

Author: Dr Maria Theodorou, senior lecturer at The Leeds School of Architecture, director of the School of Architecture for All (SARCHA)

We can start our *exegesis* of architecture by the way of a commonplace, by employing an old fashion and almost ‘boring’ understanding of the discipline as a type of manipulation of ideas and matter. In such an understanding, architects seem caught in a platonic conceptual device between the immaterial realm of ideas and the material construction of the real; it is the mediation of a projection (project, drawing) that translates and transfers their inner vision onto the external word to materialize in the form of a building or any other architectural structure.

This understanding appears reductive and outdated, especially in the current technological condition of sophisticated design software, processes of scripting and state of the art construction technologies and 3Dprinting. Architects visceral relation with the machines creates a thinking assemblage of human brain and computational programs in a nonlinear process; human bodies of architects and technicians, software, hardware and materials continually reconfigure ideas and matter and reshape the conceptualization and experience of our world. As a matter of fact, our planet is having a redesign. To paraphrase Latour (2008): Will Prometheus ever be cautious enough to redesign the planet in a sustainable way?

Latour’s (2005a) Actor Network Theory (ANT) and theories of new materialism, especially Jane Bennett’s Vibrant matter (2010), provide a valuable conceptual framework in thinking the redesigning of the world currently unfolding; their authors put under scrutiny the category of ‘matter’ understood as inert entity; they thus challenge the standard architectural approach to ‘matter’ as an entity that has only instrumental value for the design and construction of various types of structures and infrastructures. Sustainable design guidelines and materials specification – although they address performance – still largely remain within the Cartesian object - subject and anthropocentric conceptual framework.

Assemblage theory from Deleuze to De Landa (2006) to Latour (2005a) thinks through the organization of complex non-hierarchical systems. If we were to understand buildings as assemblages of human, technical, technological, organic and inorganic matter that are in a constant condition of vibrancy and emergence, another approach to architectural design unfolds. It was in fact, Manuel De Landa’s new materialism that opened up the field in that direction; De Landa framed the understanding of performativity in architecture and provided the conceptualization of emergence, computational generative design and its potential to integrate sustainable principles. Current architecture theory and practice has nevertheless been dominated by the discussion of materialism understood as a different technical – technological way of manipulating matter and data. Sustainability policy in industry focuses on a consensual model of sustainable architecture practice; it ignores the complexity of assemblages implicated in the process and has already been contested. The debate on architecture sustainability has acknowledged the fact that its terrain is made up by heterogeneous and conflicting views (Guy 2013).

Assemblage and new materialism theories emerged in other disciplines (Glynos 2012) and signaled an “Affective Turn in Social Science”, as Chantal Mouffe phrase it in the recent Westminster CSD symposium (27.2.2015). Architecture is nevertheless always quick to exploit the rich terrain of interdisciplinarity to import concepts in its toolkit of invention. Our cities can be conceptualized accordingly and understood as complex assemblages in a condition of constant emergence. Design for a sustainable future cannot but take onboard this complexity.

Theorists have also coined the term “anthropocene” (Turpin, E. 2013) to indicate our era as an identifiable geological strata on which human activity has imprinted its presence by constantly reconfiguring the natural and built environment. If sustainability takes as a point of departure the human’s relation to nature and the human’s technical technological exploitation of natural resources, new theories of the environment (Harrison 2014) rethink and challenge this understanding: humans, nature, and technologies cannot sit comfortably within given and distinct boundaries.

New materialism, assemblages, the antropocene reframe in a fundamental way the humans’ relation to both nature and technology. This cannot but impact our views on the very constitution of the concept of sustainability **(Goodbun G. & Jaschke K. 2012).** The critique to new materialism namely, that it produces a flat ontology in which humans are just one component in the assemblage and thus bear no responsibility whatsoever for their actions is counterbalanced by Latour’s (2005b) matters of concern; the latter provides a tool for thought and action. But let’s take a breath and go back to our opening outdated paragraph on architecture.

Is this fascinating re-designing/re-thinking of the world in which architecture partakes, that makes the platonic conception of the architect as manipulator of matter and ideas boring? Is this the reason that the long-dropped aesthetic judgment, based on platonic beauty, has been substituted by the category of the interesting? For interesting is what catches the attention of the bored individual.

Boredom is a condition of acute anxiety, manifested mainly in teenage years when adolescents are caught in the limbo between limited past resources (memories) and scarce future projections (visions). This teenage frustrating limbo has a name, it is called the present. Boredom is this condition of being caught in the present, being contemporary with one’s own time. Boredom is a condition of modernity (Svendsen 2005) but as Latour argues, “we have never been modern” (1993) and thus we return to it.

*“Nothing much is left of the scenography of the modernist theory of action: no male hubris, no mastery, no appeal to the outside, no dream of expatriation in an outside space which would not require any life support of any sort, no nature, no grand gesture of radical departure —and yet still the necessity of redoing everything once again in a strange combination of conservation and innovation that is unprecedented in the short history of modernism”* (Latour 2008).

This boredom of the platonic model is the anxiety that we need to bear as we cannot go back to the past reassuring dualism, back in a world that we were familiar with. Ordered categories of ideas and matter, each belonging to their realms, which humans - architects included -could traverse and manipulate. We cannot also run towards the future since there has been a rapid expansion of fields; predictions and visions are difficult and almost impossible. Since we dwell in the present, we have become, albeit not teenagers, but contemporaries.

The contemporary, according to Agamben (2009) is the one “who firmly holds his gaze on his own time so as to perceive not its lights, but rather its darkness”. As contemporaries, we can no longer be blinded by the shining materials and convoluted forms of impressive architectural achievements, or be concerned with the painstaking writing of universal sustainable architecture specifications and marvel at green buildings; Our ‘off-cells’ peripheral vision is adjusted so that we already discern the shadows that creep and crawl and are inseparable from the shining lights in our cities. We have named them shanty towns or slums in the global south, or unaffordable housing in London.

Everyone is keen to escape the grim embrace of the present, to work out a vision of the future. The proliferation of initiatives, conferences and publication on Future Cities is telling and frantic. The current publication *on Building Sustainable Futures: Design and the Built Environment* is no exception; it partakes in this anxiety of the present. And this chapter reaffirms that the concept of sustainability has been already challenged, contested and it is in the process of re-thinking.

The intertwining of future to sustainability was already there in plain view in the title of the Brundtland Report (1987), the standard historical reference to the definition of sustainability, first introduced by the UN. Agamben (2009), reminds us “to be contemporaries not only of our century and the "now," but also of its figures in the texts and documents of the past.” It is worth following his advice and rehearse the report’s title, “Our Common Future: Towards Sustainable Development”, and its well-known definition:

*“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.”*

Sustainability was born as a Siamese twin of Development. The UN text launches a cautionary remark, addressing the anxiety of its own time, the 1980’s present. The concept of sustainability appears to cast a shadow on the notion of development, as an undisturbed process of modernization, but it immediately suppress it by the evocation of the future. The Brundtland Report signaled the moment of a reversed trend. As Saskia Sassen’s (2011, p. 24) statistics chart has revealed retrospectively, the equal distribution of resources was about to end and the redistribution of wealth meant a bumpy road ahead for sections of population that have enjoyed the implementation of welfare policies after the WW2 and were to be subjected to brutal expulsion.

In the 1992 earth charter preamble, sustainability alone carries the future of a just, and peaceful global society about to enter the 21st century.[[1]](#footnote-1) Rising concerns about development and the revival of de-growth movement were sidestepped by the decoupling of sustainability from development; the former could deliver the future vision of cultural mix-bliss societies on a peace-ridden mother-earth; but already the anti-globalisation movement was brewing. UN however, never decoupled sustainable development in any of its subsequent documents. The pairing of sustainability with development has been interpreted as an oxymoron (Till 2012) but in fact, sustainable development is the name of a different logic, which makes perfect sense within the current pervasive mentality of control.

If according to Michel Foucault, 19th century early 20th disciplinary state took care of its citizens and governed their bodies, current states do not care to impose order and discipline. As Gilles Deleuze vividly described in its 1990 “Postscript”, the disciplinary state has been substituted by a state that manages and controls. Agamben (2014) argues that the state is not interested in preventing crisis, but it is instead prepared to manage any crisis; the aim is not “…to maintain order but … to manage disorder.” Sustainable development is not an oxymoron but the lexicon of the management of a crisis, that has already happened. How can one keep living standards if, as we are told and experienced, we already live in failing systems, in a permanent condition of environmental, financial and humanitarian crisis? The fitting concept seems to be ‘survivability’ rather than sustainability.

The sustainability concept cannot be dissociated from the political context which invented it and still supports it. In Gilles Deleuze’s control societies (1990) “This is no longer a capitalism for production but for the product, which is to say, for being sold or marketed”. Sustainable development is promoted as a product to be marketed, not as a problem (in the sense of a project) to be solved. Gilles Clément (2013, p.261) in his fierce critique of the ‘green business’ writes:

“*At no point has the problem of human suffering in the ‘planetary garden’ been confronted, but many give the impression of doing so. First of all, they communicate. The primary task of partisans of sustainable development is to establish a communication strategy. Words and images. Images above all. Make the aestheticized claim of a planet in crisis with photographs that are marvelous and tragic, taken from a bird’s eye views, or from afar - make books, speeches, proclaim good intentions – to change the climate, we will find the means. The technology of the twenty-first century is repositioned under the sign of sustainable development”*

Architects are not always attracted to theories and philosophers, they are educated to become practitioners and understand sustainability as a technical issue; as a problem at hand to be solved by designing sustainable structures that can save resources. Architects contribute in building up a new green economy (Clement 2013) and related industry. The coupling of sustainability to development makes perfect sense: New sustainable building materials are produced, new sustainable design principles employed. A new architecture field of study has opened up. Sustainability was inserted in architecture education, shaping the curriculum.

The concept of sustainability seems rather settled within the technical discourse, even though there seems to be a controversy; As already mentioned, the consensual model of sustainability rules/guidelines, to be applied in practice-led building design, has been challenged by a call for a more inventive, flexible, fluid approach which emerges within the sustainability agenda in both practice (Guy 2013) and education (AJ…).

Sustainability is a much contested term, if we take away its camouflaging as a technical problem that asks for a specific solution. A problem – in the Greek sense of the word *problema*, has always a double meaning; it is something to put in front of one’s eyes as a project (projection) and at the same time, it operates as a shield behind which one takes refuge (protection), (Derrida 1992).[[2]](#footnote-2) When sustainability is apprehended, within architecture, as a technical problem to be solved by prescribing appropriate design guidelines, the sustainability project resides within the safe haven of a problem intended as ‘protection’.

Nevertheless, criticism of sustainable architecture is manifested in an unlikely place, which appears to share the premise of sustainability; namely, the condition of depleting resources. The recent discussion on scarcity (Till 2012) is used to critique sustainable development and explore alternative ways of practice within the current austerity and scarcity conditions. When Jeremy Till 2(012) argues that “Sustainability thinking assumes that scarcities are inevitable and can be quantified, and that the way to handle these scarcities is through programs of reduction and control”, he, in fact, confirms the intertwining of the discourse of sustainability with the Deleuzian current state of the pervasive control logic.

It is worth noting that when building performance and post occupancy evaluations point to a failure of sustainable design the tendency is to blame the unpredictability of the human factor (Herring, H. and Robin Roy, R. 2007), i.e., the buildings occupants whose behavior defies control. Latour’s theory of “distributive agency’ in which the source of action, the ‘actant’ can be either human or inhuman and the understanding of Bennett’s matter as a vibrant condition, can provide a reframing of the sustainable architecture practice and education and bring forth the political aspects of alternatives.

 “In its broadest sense, the strategy for sustainable development aims to promote harmony among human beings and between humanity and nature” reads the conclusion of the Brundtland Report (1987). And this is a reminder that not only there is no going back to the platonic conception of architecture and its dualism of matter and ideas, but we cannot rely either on a settled relation between humanity and nature.

Our past conceptual resources are depleted already and we are condemned to the anxiety of the intense reflection of the present. This is not “a form of inertia or passivity, but rather implies an activity and a singular ability.” (Agamben G. 2009); this is the task that the authors of this chapter have undertaken in presenting and discussing instances of their practices and experiences in the present tense.

*Part 2: PRAXIS*

**WATERBANKS: a case study**

*Author: Professor David Turnbull, The Irwin S. Chanin School of Architecture at The Cooper Union for the Advancement of Science & Art, Design Director of PITCHAfrica and the Waterbanks Initiative.*

*Waterbanks is an Initiative of PITCHAfrica, a not-for-profit Design and Research group that I co-founded with Jane Harrison, and where I am Design Director. We work across the African continent, with some of the most disadvantaged communities in the World.*

*The premise is simple. Given the impact of Climate Change on weather patterns, rainfall and other forms of precipitation might it be both necessary and desirable that building types are developed that can harvest and store as much water as possible, providing enough capacity that the increasingly erratic time divisions between the ‘rains’ can be ameliorated. Could this provide an incentive for the widespread provision of locally based, dispersed and decentralized infrastructures for water supply? And, finally could this model, which demands a level of community based stewardship that piped, linear, centralized systems do not require, provide the circumstances for invention in relation to the political processes that govern water-use generally, and ultimately ‘survival’?*

Many of the challenges that arise in communities stricken by poverty and disease stem from a lack of clean water, and a lack of access to a feasible water supply. Development initiatives rightfully focus on the urgency of water provision but the extreme complexity of the social issues that surround water provision are all too often beyond the capabilities and resources of the organizations providing the technological expertise. Additionally, the international development community has focused on ground water resources since a UN edict in the 1980’s. Ground-water, and surface-water supplies are often seriously contaminated, heavily fluoridated or contain concentrations of toxins like arsenic. Bore-hole wells drilled into underground aquifers frequently break, and without engineers or tools, remain broken. Aquifers sink and are not replenished. According to the UNEP, 60% of the bore-hole wells drilled in 2004 failed within a year. More than 320 million people living in Africa do not have access to clean water. Many of these are children, particularly young girls, who cannot go to school because they have to walk miles to collect water from rivers or streams, dirty water, instead. Dirty water kills around 4500 children a day.

Many people do not know that there is 13 times the amount of water needed, falling as rain, across the African continent, and that most people who do not have access to clean water live in areas with more than 300mm of rainfall annually. In many areas of the Sub-Saharan region suffering from extreme poverty and challenging conditions in relation to water access, nutrition and sanitation, have up to a meter of rain in the year, some much more. The distribution pattern of rainfall throughout the year is changing as a consequence of climate change, but erratic rainfall patterns - the arrival of the ‘rains’ earlier or later than expected, deluge followed by drought, makes rainwater harvesting and water storage more important than ever.

We are committed to demonstrating the overlooked potential of large scale community based rainwater harvesting initiatives, based on a local, dispersed, decentralized and non-linear approach to infrastructural construction; significantly, the potential of rainwater harvesting as a catalyst, instigating social transformation within a community by making carefully designed, low-cost, buildings, with significant water storage volumes, and integrated water filtration systems. We call these structures, ‘Waterbanks’. We have been focussing on Schools as in our experience ‘Waterbank Schools’ can become a significant resource in the community, addressing multiple issues simultaneously. In areas where Land Rights, and land ownership battles are common, Schools are built on land that is less contested. Schools have principles that embrace concepts of shared ownership, governance and accountability that transcend tribal differences. Within the precinct of a School the pursuit of gender equality is more achievable. Schools also have the capacity to attract sympathetic, like-minded people in community based organizations, foundations and non-governmental organizations, who can provide the funding and social support that is necessary in confronting some of the most intractable social issues that underpin poverty, and impact many people, girls and women in particular, profoundly.

We insist that Waterbank School Buildings are never ‘just’ schools, and we have found that it is possible to build twice the volume, with integrated water storage and filtration for the same cost as a typical four classroom school. So that while working with completely generic space standards and normative budgets that are familiar to every organization working in the International Development field, every school can have a cistern and clean water supply, can be a tool for teaching children about environmental issues, an attractor and catalyst for the community, and effect environmental and social change. The discipline of building at the lowest costs possible while providing more space, light, ventilation, protection, and a consistent water supply at school involves us in a process of design and development with local partners, NGOs, community leaders, teachers, students and their families that builds social engagement and an enduring commitment to people and place. In the past ten years we have designed and built a collection of high yield rainwater harvesting building types, invented and patented modular ceramic water filtration systems, and a structure that integrates rainwater harvesting and water storage into a sports stadium - bringing Africa’s passion for Football together with it’s greatest needs, water, nutrition and sanitation. The work depends upon a return to some of the fundamentals of Architecture and involves spatial, structural, material and technological invention at multiple scales, from the nano / micro-scale behavior of water percolation through ceramic water filtration membranes to the scale of buildings and accumulations of building types, to climatic, geographic, social and ecological patterning. A key idea behind all the work relates to a term, ‘reverse innovation’, used in the sense of looking back historically in order to look forward more effectively, but also in support of a reciprocity between advanced research and poor technique that makes the designs easily replicable, increasing impact.

How did we start?

In 2004 we were working on a speculative project in South Sudan, linking access to water to the catalytic power of football. This project for a football field that could harvest rainwater was exhibited in New York at The Van Alen Institute in 2006. It addressed water access, food security, health, education, gender equality and community development, simultaneously. We called it PITCHAfrica. Once the word was out, we established important relationships with Grassroots Soccer and [Play Soccer](http://www.playsoccer-nonprofit.org/) International who were having real success using football to effect social change. The following year we were in Copenhagen, for the Metropolis Biennale, organized by the Copenhagen International Theatre, KIT, and the Danish Architecture Centre, and collaborating with the [Homeless World Cup](https://www.homelessworldcup.org/), an organization that is using the power of street football to end homelessness. While we were at the Tournament, (image 1) Jane and I did calculations for the rainwater harvesting yields for the small Street Football Stadium that we were sitting in. The results were extraordinary, in excess of 1 million liters per year in a semi-arid region, and the space under the stands was more than adequate for classrooms, clinics or other community facilities. We knew then that a small stadium designed to catch the rain could be incredibly transformative.

We organized a friendly game with players from Kenya and Uganda, made a video and drawings. (image 2) We gave every African team documents explaining how a PITCHAfrica stadium worked. In early 2008 we met the Annenberg Foundation Board, and a few months later received a significant grant providing backing for project development and testing. We built prototypes, and we conducted extensive research into water filtration options focusing on ceramic filters which can be made locally rather than expensive imports. (images 3 - 6) We filed patents. We made projects. In July 2010 the Annenberg Foundation supported work culminated in the construction a full-size demonstration model of a PITCHAfrica stadium in Los Angeles, launched during the World Cup by South African actress Charlize Theron. This was televised in the USA and created considerable international attention. (image 7) On the back of this event we set up PITCHAfrica as a social enterprise in its own right. The rainwater-harvesting stadium was the flagship, and a wide variety of rainwater harvesting structures, water filtration devices and irrigation tools, were designed and ready to go. We wanted to develop PITCHAfrica rainwater harvesting demonstration centres in Southern Africa, West Africa and East Africa, but getting projects implemented was tough-going. We had become increasingly convinced that finding the right scale for an initial community based project was crucial. We knew that the cost of the stadium building, although very low in relation to comparable buildings in the USA or Europe had the potential to destabilize community development by putting too much investment in one place at the expense of neighboring areas, biasing migration patterns, and creating problematic population growth; especially true in pastoralist communities. Starting small had always seemed more appropriate, and a structure that could be copied easily and cost no more than 38,000 Euros or 50,000 US Dollars a more manageable target.

We struggled to work out viable partnerships in Southern Africa, trying to put together projects in Kwazulu Natal, ZA in 2011, and further north in Ndirande, Malawi in 2012, making grant applications and multiple project proposals. We failed. I was invited to be a Visiting Professor of Design and Innovation at The African University of Science and Technology, a Nelson Mandela institution in 2012, and we produced a strategic plan for a Waterbank Farm on the Campus in collaboration with AUST faculty including Prof. Wole Soboyejo and Prof. Albert Ayeni. In East Africa we had more success. Since late 2007 we had been in contact with a number of important Kenyans including Mohamed Ahmed and KHSSA, Kenyan Homeless Street Soccer Association, and Bob Munro at MYSA, the Mathare Youth Soccer Association, who were doing great work. I had met Wangari Maathai at the Cooper Union in New York and initiated a dialogue.

Then, after an introduction from colleagues at the Mpala Conservancy in Laikipia, in early 2011 we received a call from Dr. Liz Rihoy, Director of the Zeitz Foundation, based on a neighboring Conservancy, Segera, and I went to Kenya for the first time. Kenya is an ideal place to implement community based rainwater harvesting initiatives. The geography and climate are perfect, and the presence of the United Nations Environment Program Headquarters in Nairobi an asset. Dr. Rihoy felt there was a great fit between our work and the Laikipia Unity Cup, a program the Zeitz Foundation had developed. The LUC and Laikipia Unity Program use a Football Competition as a setting for environmental education. She was keen to see how we might bring PITCHAfrica to Laikipia. For us, a collaboration with the Zeitz Foundation was an excellent opportunity to realize the designs and technologies we had developed and demonstrate their transformative potential. Later that year we sent Daniel Gastfriend, as a PITCHAfrica intern, to work with the Zeitz Foundation and I made my first visit of many to Segera. Daniel spent time with the school community at Uaso Nyiro, near Nanyuki in Kenya’s semi-arid central highlands, and also worked on a Zeitz Foundation project that has since become the SATUBO, SAmburu, TUrkana and BOrana, traditional crafts enterprise. Then, in early 2012 the Zeitz Foundation obtained funding from Guernsey Overseas Aid for a school building at the Uaso Nyiro Primary School and asked us to propose a design that demonstrated PITCH principles. This was an opportunity to adapt one of our designs. (image 8)

In Kenya there is seven times the amount of rain fall than is needed by the population. Rain is an astoundingly misunderstood and underused resource and one that asks that we change our unsustainable relationship to water to a balanced one. A Waterbank is designed to transform our relationship to water. If ‘business as usual’ advocates extracting water from underground, from non-renewable aquifers, and building schools that deflect rather than catch and store rainwater easily. Waterbanks reverse this, bringing the water to the center of the building, manifestly, demonstrating how this resource can empower whole communities and lead to systemic change, and that everyone can have clean water. And so followed the construction of the first Waterbank School which was built at the Uaso Nyiro Primary School where Daniel had been working, in 2012. The building is a square, 24 x 24m set within a circular perimeter wall. The plan is very simple, by necessity.

The Waterbank School is designed to harvest the maximum amount of rain with minimum materials and effort in a central courtyard with underground cistern. Rain falling on the roof drains with 95% efficiency into the cistern, and is drawn off and filtered by ceramic water filters when used, removing 99.9% of pathogens. Water is used for drinking, daily meal preparation, hand-washing and irrigation. Surrounding the central cistern are protected, well-ventilated classrooms, teaching gardens and a community workshop, for the parents and for community activities, enabling the school to become a catalyst for transformation. Even in this semi-arid region the school delivers 350,000 liters of water annually. By example the school initiates region-wide rainwater harvesting, filtration and conservation agriculture efforts. The roof of the cistern is all-school gathering place and environmental theater where essential knowledge about practices and technologies is shared across ethnic and language divides. The school educates 360 children, and provides water for 680 children, from seven tribes, pastoralist communities living on less than $1.40 per day. It serves as a community education center for 4000 and as a demonstration school for a region of 400,000 people. On the day Nelson Mandela died and people across the continent were mourning, we got message from Njenga Kahiro, Community Liaison Officer at the Zeitz Foundation to say the tank was full to overflowing for the first time. It was a poetic moment, as if both tears and rain had created a supply of water and renewed life for a community. The School was named Greenest School on Earth by the US Green Building Council, and ‘Waterbanks' was listed as one of the top 100 sustainable innovations by SUSTAINIA, from Denmark, in 2013. (images 9 - 12)

Also, in 2013 we participated in the Buckminster Fuller Challenge, and won the inaugural ‘Interface Support Award’ for ‘Waterbanks’. As part of the very rigorous Challenge process we had to write short sentences that described how the Waterbank School addresses Buckminster Fuller’s seven criteria for Innovation. Being forced to make succinct claims in short-form is always useful and this is what we said:

1. VISIONARY: All new schools in poor communities where it rains can produce clean water and fresh food for children and catalyze community transformation

2. COMPREHENSIVE: The solution is simple, affordable and cross-cutting, directly addressing rural poverty, ill heath, lack of education and environmental degradation. Systemic change is driven by a geometrical, material and social reconfiguration of standard school design.

3. ANTICIPATORY: Anticipating global aquifer depletion, with 1 billion people worldwide without clean water and 60 million children out of school, our relationship to water must change. The Waterbank School, directly addresses this need.

4. ECONOMICALLY RESPONSIBLE: The school is an artificial watershed. Each element works hard, structurally and socially, using the fewest resources, to deliver the greatest impact on a child’s health and a community’s transformation. All buildings will need to be Waterbanks.

5. FEASIBLE: It is built simply using local skills, resources and technologies, supporting self-sufficiency and avoiding dependencies.

6. VERIFIABLE: The school is built and a post-occupancy evaluation underway. Attendance has risen by 25% to 95%. Instances of waterborne disease have dropped to zero.

7. REPLICABLE: With simple guidelines anyone can build a Waterbank School.

The principles seem to be gaining some traction and more Waterbank School Structures were completed in the region in 2014: The Endana Secondary School in Laikipia in Kenya’s Central Highlands is the location of the first Waterbank Campus, (image 13 - 14) a collection of Waterbank building types have been built in 2013 -14 and are connected together by conservation agriculture plots, creating a model school that harvests and stores more than 2.5 million liters of water annually. The Waterbank building types demonstrated here include PITCHKenya, a 1500 seat rain harvesting sport stadium with integrated classroom block and environmental center, A Waterbank Girls Dormitory for 100 girls, A Waterbank Canteen and Dining facility and various Waterbank Latrine blocks. (images 15 - 18) Each Waterbank building type is designed to integrate water harvesting, storage and potable water filtration. The form of each building is designed to maximize the volume and retention efficiency of the water harvested, storing the supply underground, at the heart of each building, for use by the building occupants where a dedicated water supply can help support specific needs. The Waterbank Girls Dormitory provides a clear example of how this works. The building is designed to accommodate 100 girls in 3 dormitories that face onto a protected courtyard garden. The building can harvest up to 360,000 liters annually creating a dedicated supply for the young women to address comprehensive needs including; drinking water, water for sanitation, showering and the washing of clothes and water for irrigating the garden that will be developed to provide a sanctuary with nutrition rich plants and natural remedies. It is a safe place, away from the boys and men in the School Community, in a walled compound, with a secret garden, and a small house for the Matron, a surrogate mother, who looks after the girls. (images 19 - 20)

In January 2014, I walked around the Endana site with the governor of Laikipia County. (image 21) He was incredibly enthusiastic about the work and really understood the potential of the Waterbank and PITCH building types. There was a mood of excitement about the project and the idea that water harvesting centres could also be known as centres for community and peace building and an example that could be followed in other schools. Now, in early 2015, The Waterbank Campus is nearing completion and the conservation agriculture beds are being prepared. The Ceramic Water Filtration systems have not yet been installed in the respective Waterbank buildings but when completed will provide potable water throughout the Campus.

Each Waterbank Structure has been developed to address a specific set of issues that are central to improving livelihoods and health in rural regions suffering from a lack of access to clean water. These issues range from water and food security, to gender rights, environmental education and sport for development support. The Campus has been developed to welcome community participation and support the spread of knowledge about sustainable lifestyles throughout the region.

What are we doing now?

We have stated work on a Waterbank District or Urban Quarter in the Niger Delta where the annual rainfall is close to 1.5 meters per year, but where the ground-water is heavily contaminated. This district is intended as a demonstration of the Waterbank approach in an urban setting and the design process involves the development of residential and mixed-use building types as well as schools, clinics and institutional structures. Historical antecedents can be found in Vitruvius’ descriptions of the construction of cisterns in antiquity, Roman ‘Impluvium’ courts, French ‘Lavoirs’ or English ‘Dewponds’. The filtration systems are made simply using clay, wood-dust, and colloidal silver, based on open-source documents prepared by Ron Rivera, improved and tested in Labs at Princeton University and the African University of Science and Technology in Abuja. The first Waterbank School was an Island, and isolated singular building, the Waterbank Campus is an archipelago of types, the Waterbank District is a dense urban accumulation or cluster. Our research continues by building and continuing to explore the ways and means for scaling the project.

This work is only possible with a lot of good-will, and with funding or in kind support from the Annenberg Foundation, Zeitz Foundation, The Buckminster Fuller Institute, INTERFACE Inc., AUTODESK and The Clinton Global Initiative we are working toward the launch of WATERBANKS OS in 2015, an open-source operating manual on the design, construction and use of Waterbanks, starting with a Waterbank School. A central part of this effort is to communicate how the stored water can be used and regulated most effectively so that throughout the dry seasons there is a consistent water supply and that the water doesn't run out. Feedback from the school buildings that have been completed at Uaso Nyiro and Endana will play a key role in the Waterbanks story and the success of the open-source variants. The challenges that lie beyond the self-evident complexity of building anything in remote parts of the world without roads, with limited resources and skills are all concerned with governance, the way that groups of people organize themselves to manage the water resource, to draw-off only the amount of water that is needed, and understand the dynamic interrelationship of water captured to water stored and water filtered and used, in uncertain times with less predictable weather. In this sense Waterbanks pose a question…

*Part 3: STASIS*

***Architecture Knowledge Assemblage***

***The Sustainable Present of Architecture Practice and Education***

A discussion with

David Turnbull and Maria Theodorou

on ATOPIA[[3]](#footnote-3) and SARCHA[[4]](#footnote-4)

*The discussion focuses on the experiences that both authors share in practicing architecture by taking a stance towards the profession and seek alternative ways of architecture production and of the production of architecture knowledge. Can their experimentations be understood as ‘sustainable’ architecture practice, in other words, can ‘sustainable’ architecture be produced only within a different mindset that generates another type of practice and education?*

***The Architecture Knowledge Assemblage***

Maria*:* We have met long ago in 1995 at the AA in London but it was only 10 years later in 2005 at Princeton that we had the chance to discuss our common interest in developing and experimenting with alternative ways of practicing architecture. I remember you presented ATOPIA and first ideas on the PITCHAfrica project in your backyard and I was trying to sketch out an independent structure (SARCHA), a hybrid between school and practice, to carry out research on topics that were somehow considered unintelligible. It seems there were a number of things that had changed within the architecture profession between 1995 and 2005 that created a different mindset for both of us.

David: Yes, I think that there had been many changes, personal and professional, not least the transition for us, from the UK to the USA. In 1996 I was invited to teach at Yale as the Eero Saarinen Professor, a big step, and the beginning of a trans-Atlantic life that continued until 2002 with Jane’s appointment at Princeton University. This provided a period of stability in which we have built our practice, and developed the ATOPIA project as an umbrella for many design and research activities that challenge conventional expectations about what it means to be an Architect. SARCHA’s conception as a ‘School of Architecture for All’ also questions the authority and the education of the architect in addressing complex city conditions. In common with many of my colleagues my teaching started to reflect the impact of the 90s, the ‘digital decade’, critical structural changes in the global economy, manifest in urban structure and building design, and an increasingly urgent ecological imperative.

Why ATOPIA…? ATOPIA is an idea that can be discovered equally in the fields of Architecture, Aesthetics, Economic Theory and Science Fiction. In accord with Vittorio Gregotti's essay 'On Atopia' in his collection, Inside Architecure (1996), we saw spatial diffusion and the failure of the local as a category as symptomatic of a generalized globalization of means and methods. We witnessed the exacerbated thinness and dematerialization of architectural effects, and the collapse of any sense of social purpose. We agreed with Gregotti that an increasingly pervasive 'oriented atopia' should be challenged.

This was the perfect alibi for our work. Atopia is an idea about space and time; borderless, enabled by advanced communications media and digital tools, and omniscient; the perfectly flawed but ubiquitous setting for invention, technological innovation and design, an explicit 'anti-utopia'. The publication of German sociologist, Helmut Willke's 'ATOPIA' (2001) reinforced the obligation that operating on atopia, in 'atopian constellations', refusing the cult of the individual and the romanticism of individualism, had become for us. The more recent publication of ‘The Atopia Chronicles’ (2012) by Science Fiction writer Matthew Mather dramatizes fundamental choices that impact the survival of the human race; choices that are not options for us. This made the definition of two paths and two 'businesses' a necessity for us, both working with the paradoxes, ambiguities and contradictions of atopia: ATOPIA Innovation (for profit), consulting with Institutions, Development Companies & Foundations; ATOPIA Research (not for profit) working on global challenges with NGOs, Community Based Organizations (CBO's) and Corporate Social Responsibility Programs (CSR). PITCHAfrica and Waterbanks originate from the not for profit path.

In the same time-frame you were developing SARCHA, what sparked the idea?

Maria: SARCHA was conceived as an architecture school open to all with the aim of conducting independent research on pressing issues on architecture and the city. This was a much needed experiment in 2005 since the teaching of architecture still reflected a ‘post- critical’ condition. The fascination with new technologies of design and construction overshadowed any political, social and financial issues that were already present in the cities but largely ignored by architects.

In 1997, I curated the Greek Ministry of Culture pavilion at the UNESCO International Conference on “Education and Public Awareness for Sustainability”. However, the notion of sustainability as a vision ‘of a peaceful and just global society in the 21st century’ (Earth Charter 1992) was already crumbling. In 2003, during my visit as a Council of Europe cultural policies expert in Tbilisi, the capital of Georgia in Caucasus, I was confronted with the vision of the future to come: Iveria a luxury hotel in the heart of the city was turned into a vertical IDP’s (Internationally Displaced Persons) camp. Instead of a report on cultural policies, I drafted a short article on Iveria published in the Council of Europe journal (Theodorou 2003), which later became a longer piece for the Anarchitektur publications (Theodorou 2007). It seemed that the cultural, smooth, just and peaceful sustainable future had a sinister turn. The present was manifested as a moment of the ‘political’ defined by political theorists such as Chantal Mouffe (1993) as the moment of rupture of an existing condition which has not yet substituted by a new one. Routlegde book series on the thinking of political that run from1994 to 2005) featured a number of publication that informed my thinking. Yannis Stavrakakis, author of the *Lacan and the Political* book (1999), became an interlocutor, contributing to the thinking and naming of SARCHA; he sits on the advisory board ever since.

SARCHA’s focus on the political aspects of architecture could not be fully grasped by architecture educators in 2005. It seemed the schools in academia were operating on a standard repertoire of topics related to the agenda of the 90’s; however, this trend was soon to change. In 2005, only a handful of marginal groups and individuals were meeting in Europe to discuss Architectural Resistance and similar topics of concern; today everyone in architecture schools appears aspired to architectural activism and radical pedagogies.

If in the notion of sustainability, the 1992 Earth Charter envisioned a ‘peaceful global society’, the emergence of the ‘political’ signaled another disturbance: a number of thinkers had already pointed out a problem with the concept of society and there were developing further Deleuze’s notion of assemblage to conceptualize emergent complex systems of organization and address issues of governance and self-governance. Hardt and Negri’s *Multitude* (2004) was followed by Latour’s *ANT: Actor-Network-Theory* (2005). I remember Bruno Latour’s book on *Making Things Public: Atmospheres of Democracy* was out in 2005, and it was part of our discussion; Manuel De Landa’s *A New philosophy of Society: Assemblage Theory and Social Complexity* followed a year later (2006). Do you think that what we started in 2005 emerged within this theoretical framework?

David: We have a number of seminal figures whose thinking has inspired us, who we talk with, or who we feel an affinity for. Clearly, Bruno Latour is one of these figures, ‘We have never been Modern’ (1993), his reflections on ‘Design’ with particular reference to Peter Sloterdjyk, and the ZKM exhibition catalogue: ‘Making Things Public’ (2005) have been particularly important, as they have been for many in my generation. I also love the work of Michel Serres. Love being the keyword, because my relationship with it is more emotional than intellectual. My library is the library that you might expect, a collection of volumes brought together obsessively since the early 1970s, reflecting conversations that were taking place within and outside Architecture, in London at the AA and internationally, but with particular emphasis and completeness in the collecting when ideas resonated; Serres, Latour and Deleuze, De Landa, and Felix Guattari’s Ecosophy. It is clear to me that without this theoretical framework, and insights found more recently, the ATOPIA project would not exist….and SARCHA.

***The sustainable present of architecture practice***

Maria: yes, indeed. SARCHA was envisaged as an assemblage; it operates as an open structure and everyone can join with no subscription fee. To remain independent, SARCHA plugs its network of associates, their skills, abilities, knowledge, technical, technological equipment and physical locations, into available institutional or independent structures, operational mechanism and devices to maximize the potential of humans, things, and processes involved. It currently has 277 associates worldwide, who can freely choose topics to set up projects on issues of concern. Migration and xenophobia, city and economy, the sharing of resources and self- governing are among the research projects SARCHA has undertaken and implemented with limited funding. SARCHA’s architecture practice+education structure understands ‘sustainability’ as an insightful anatomy of the present conditions.

Next time we crossed paths, was in December 2008 in Athens Greece. This was an important year signaling the start of the economic crisis. In USA the real estate bubble had burst and Athens experienced the first disruption of an hypnotic state in which democracy and the city functioned as spectacles of undisturbed consumerism. By that time, we had both set up our alternative structures (ATOPIA and SARCHA) to implement our ideas and it seems they were timely. The financial crisis, that was to become a permanent condition paired with the environmental and the humanitarian crisis, manifested in migration flows and expulsion of populations, has created an opening for rethinking architecture as a professional practice. How does ATOPIA deal with such issues?

David: OK, I think that rethinking architecture, specifically ‘how and why’ became obligatory. The experience of working on a project in Sri Lanka after the Boxing Day Tsunami of 2004 dramatized the need for new models, and practices in which the ‘client’ disappeared as a figure, to be replaced by ‘issues’ or in Latour’s terms, ‘matters of concern’ (2005). We were working on a plan for a small University on the Southeastern coast of Sri Lanka, seriously damaged by the Tsunami, and then again by the rains that followed. The remains of the campus were south of the extensive land-mine fields from the Civil War, but subject to the activities of insurgents from the South. The Vice Chancellor was a Tamil. Girls studying at the University now found it too dangerous to walk or cycle from home. The terrestrial communications networks needed to be rebuilt or augmented. We were hoping for a viable plan for what we called ‘the smallest university with the biggest informational footprint’, a university with almost no architecture in a conventional sense, for which a combination of electrical engineering and curriculum design would provide the foundations. A relational architecture of places and processes, tools and techniques, (informational) networks and (ecological) loops was required, inflected by the impact of War and Environmental Catastrophe. The lesson could not have been more stark. The question was then how to carry this insight forward to become more generally applicable in complex situations that may not be described in relation to an overt crisis, but where there is an inherent instability that must be understood, and there are multiple ‘actors’. This is true for our research on the increasingly depleted Ogallala Aquifer in the USA, as much as it is for the PITCHAfrica and Waterbanks initiatives.

Maria: Political theory and Assemblage theory shaped the constitution of the School of Architecture for All - SARCHA and its first research project on the category of the Unbuilt. The "Negotiating the Unbuilt: Space and Democracy" symposium (partially funded by the ESRC UK) coincided with the Athens December 2008 political events and framed the context in which ATOPIA presented its PITCH Africa project. What was the relation of your project with the theme of the symposium?

David: 2008 was a crucial year for us. We had just received funding from the Annenberg Foundation for PITCHAfrica. We had established some principles and were working on preliminary design proposals, drawing diagrams and thinking through what a ‘place of assembly’ might be, as it pertains to complex constituencies, unpredictable social conditions, difficult technical considerations, poverty, gender equality, nutrition, education, health and access to water, in a context marked by tribal conflict, with contested territories, persistent land rights battles, the legacy of colonial governmental practices, protocols and corruption. At that stage, our project was literally unbuilt, and explicitly addressing structures that must be paradoxically ‘unbuilt’ and yet constructed - assemblages.

Maria: I remember one recurrent issue that we discussed in a number of occasions; it touched upon the relation of your project to philanthropy and charity work conducted in Africa by a number of organisations. Philanthropy has been criticized, and rightly so, for keeping a condition as it is, providing only temporary relief. The ‘empowerment’ approach has been also taken up before by organisations in Africa in order to smooth the ground for collaboration when the help of locals was indispensable for the successful implementation of various projects. How do your projects relate to both philanthropy and empowerment?

David: Its complicated and, understandably, this question haunts everything that we do, and comes up every time that either Jane or I present the work. PITCHAfrica is now the business name for ATOPIA Research Inc. which has tax-exempt status as a charitable organization addressing environmental issues and humanitarian concerns, at least that is how it is expressed in the documents that were used to achieve that status. However, we are acutely conscious of the predicament that is produced by the terms and the dilemma that we must sit with, by necessity; the proximity of ‘humanitarian’ to ‘development’ and ‘security’ being critical. Every aspect of a project is fraught with complexity, the funding, contractual negotiations, community relations, document production, dissemination, project management, monitoring and evaluation. We had many arguments with one funder whose use of militaristic expressions like ‘in country’, or ‘boots on the ground’ rendered the Foundation / NGO relationship particularly problematic. The question of motivation is always present in any donor’s relationship to their donation and the activities that it supports, as it is at all levels in the communities that we have worked with. As we all know, giving and receiving gifts is never straightforward. We cannot escape, but we can rewrite the terms, and chose which issues to focus on. This is why we are so concerned about cost and replicability - in a sense, privileging the unexceptional and the typical as a goal. There are too many examples of philanthropic investment coupled with designing ‘like you give a damn’ that produce remarkable situations, even beautiful buildings, that are only possible in a unique nexus of political power, wealth and expertise. We are also very interested in the questions that the notion of ‘success’ produce - how is a project successful, or rather, when, and according to who? We have learnt that sticking with the questions, having respect for ambiguity, and understanding the agency of words and images in different contexts is necessary and useful. So, we might use the word ‘empowerment’ or ‘empower’ on our website, we might talk and write about ‘campaigns’, but we will avoid ‘victim’ photography, preferring a documentary approach.

Maria: Have you looked at the history of water shortages in Africa and the traditional ways of coping with this issue? Or did you just take a practical approach, namely: what is the problem? How can we solve it? In other words did you address only the effects of a problem?

David: We are very interested in the history of peoples’ relationship with water all over the world and in the history of technologies that have been developed to bring water from one place to another so that it can be used. We have also collected photographs, texts, diagrams and drawings of buildings, infrastructures and technologies for domestic water supply and irrigation that have been used in the past in many countries on the African continent. Devices for collecting or redirecting surface water resources being the most obvious. The construction of dams at many scales being another. There are also amazing examples of rainwater harvesting building forms in Benin, Ghana and the Niger Delta in West Africa, and on the Tanzanian coast in the East. Roman settlements in North Africa and the Nilotic region were built on a patch-work of cisterns.

Maria: to continue with the name giving; at the initial stage of your project the ‘PITCH Africa’ was your catch phrase, and it seems it had a celebratory – joyful tone, solving water shortages and using sport. Was there a particular reason for this? And why change it in 2010, and use the term Waterbanks? Does this relate to the promotion of the project in the west rather than in Africa?

David: We have not thought about our use of the name ‘Waterbanks’ as a change. PITCHAfrica started as a project that was exhibited at the Van Alen Institute’s ‘The Good Life’ in 2007 (curated by Zoe Ryan) bringing ‘Africa’s greatest passion, Football, together with its greatest need, Water’ as a demonstration of the potential of hybridity. It was intentionally optimistic, indeed joyful. When we launched the next stage of the project in Los Angeles we created PITCHAfrica as a social business, not just a project, and funding for this allowed us to develop ‘Waterbanks’ at a variety of scales, ‘Rainchutes' as demonstration products for teaching groups about rainwater-harvesting, and ‘Filterbanks’ as a way of promoting ceramic water filtration at a scale where it could be effective with large populations. Since then we have discovered that the idea of a water-bank communicates broadly and very effectively. People get it…and I think that is true because a bank full of water has value, can include reserves. Water can be drawn-off, or out. The supply can be replenished. It flows, it can be metered, measured, systems of allowances can be set. The language of banking is a common language. Equally a bank can be owned, and then things get interesting.

Maria: Water has become a commodity to be sold by hedge funds; does the name ‘Waterbanks' reflect this change and point to the current exploitation of basic goods?

Saskia Sassen in her recent talk (in LSE symposium in India on governing urban futures 2014) entitled *Who owns the city*, explained how city and land are privatized; large chunks of cities and land are being bought by big corporations and this will affects the water and food supply. From money shortages to water/ food shortages. Does the name Waterbanks highlight this process?

David: We have actually discussed our approach with Saskia Sassen and Richard Sennett in the context of a workshop on *Democracy and Climate Change* at NYU in October last year; specifically an idea that ‘rain’ may be a last manifestation of the commons - the crucial questions concerning the ownership of the water once it has been captured, and how it is valued and managed, and who is responsible for this.

Maria: In the future will all buildings will need to be waterbanks – in Africa or elsewhere?

David: We think so. Let’s consider the water crisis in California as an example, or desertification globally, and climate change generally. Erratic weather patterns, depleted aquifers, increasingly saline coastal wetlands and waterways, diminished snow cover in mountainous regions, high energy and maintenance costs, all point to the potential of non-linear, decentralized, dispersed approaches to water infrastructure, and local places of assembly with high yield, high capacity reservoirs or cisterns: Waterbanks.

Maria: what was the difference in working in Africa and in the West? University approach rather than community approach, what was the resistance from local people and the difficulties in reaching them?

 David: Africa is a continent and we have been working in four countries, Kenya, Nigeria, Malawi and South Africa, with early stage work elsewhere but too early for me to say too much. Nevertheless it is clear that the challenges, and opportunities vary considerably depending on the context and the partnerships, and other informal relationships that are necessary in order to accomplish as much as possible. We have a very strict rule that makes University partnerships difficult, even after the common realization that University - Community partnerships can be very effective. This rule concerns the relationship between construction cost and overall project cost. Projects that involve Universities in the US and probably the UK carry considerable overheads, up to 60% of any grant application, and travel and accommodation costs alone can be more than the construction cost of one of our buildings. For me to make a site visit in rural Kenya, costs 10% of the cost of the Waterbank School building…clearly this has a big impact if our stated goal is replicability. We use Skype and dropbox for supervision, cell-phone photographs and video clips, email and Facebook chat. We can do this because while there is no water supply, poor or no sanitation infrastructure, and extreme poverty, there is also incredible beauty and a robust wireless communications network. Kenya is the home of Mpesa, mobile banking, and almost everyone can get to a cell-phone, even if they do not own one. East African time is the same as Central European time, so communications typically take place in the morning in the US, afternoon in East Africa. Drawing protocols are British, as a post-colonial inheritance, but beyond the fundamentals of setting out, the drawings are only a guide or will be unread. Marked up photographs, sketches and other indications of design-intent are more effective. A comprehensive drawing set dictating all on-site processes would be meaningless. The work progresses like a conversation, or call and response.

Maria: Education, school and schooling are integral to Waterbanks; what is the role of school in the local communities?

David: Schools are the central meeting place in rural communities, and the only place where land-rights and tribal relations can escape the ambiguities and conflicts that exist everywhere else.

***The sustainable present of architecture education***

Maria: Sustainable design has entered schools’ of architecture curriculum at both Undergraduate and postgraduate level. Do you share the view that the role of education is to question existing conceptualizations rather than turning them into subjects of learning? Can we use the word sustainability when systems have already failed? It seems the vision of a global just society as envisaged in 1992’s concept of sustainability has evaporated, turning ‘sustainability’ into an empty signifier. For a large portion of earth’s populations, the concept of sustainability, as keeping up existing living standards and conserving resources for future generation, is not applicable; the majority of people just strive to reverse the trend of constant failure. It is ‘survivability’ at the present tense that matters.

David: In design education, toward sustainability however that is defined, I favor a tripartite structure that draws on Felix Guattari’s elision of Ecology and Philosophy into a singular and urgently needed Ecosophy. His identification of three ecologies, mental, social and environmental, for me, provides the template. The provocation, by Bruno Latour among others, that a site can be considered as a place of assembly and exchange, of humans and non-humans, energy and matter, with multiple scales, and time horizons, provides the alibi. Overlaid on this, in response to the irrefutable ‘call to order’ that the ecological imperative presents, it is becoming clear that new habits of thought and action are necessary, that need names, surrogates or avatars so that they can be communicated. As a short-hand I use the ‘rainmaker’, the ‘spider’ and the ‘fly’ as characters, or figures. The rainmaker designs the atmosphere, transforming the weather, the spider builds networks, the fly is an expert in non-linearity. For pedagogic purposes I consider all distinctions useful, and attempt to embody their ways of being, individually, in order that we might arrive at a better understanding of who we are and what we can do. Never-the-less, just as mental, social and environmental ecologies can never be separated meaningfully, the ecologically savvy architect must embody all three characters, simultaneously.

Finally, our experience with Waterbanks really underscores a realization that architectural education must address present day realities much more forcefully, must be willing to look long and hard at the world, as it is…..and that work is conversational. A conversation is more than a dialogue. Conversations use networks to build networks that, however complex, facilitate effective action. Conversations are not arguments, but may involve disagreement. Conversations are not consensus builders, but they can be inclusive: person to person, issue to issue, human to non-human, and back again, as an endless, recursive, call and response.

Maria: It seems architecture education would be less and less about the design of sustainability; the focus is slowly and steadily shifting into training architects as contemporaries. The contemporary is able to discern the darkness emanating from its own time rather than seeing its blinding lights (Agamben 2009). Focusing steadily on understanding the present conditions would enable architects to re-conceptualizing their practice and education. Sustainability as a vision of the future is inevitably under scrutiny in the current intensity of the present.

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1. “We stand at a critical moment in Earth's history, a time when humanity must choose its future. As the world becomes increasingly interdependent and fragile, the future at once holds great peril and great promise. To move forward we must recognize that in the midst of a magnificent diversity of cultures and life forms we are one human family and one Earth community with a common destiny. We must join together to bring forth a sustainable global society founded on respect for nature, universal human rights, economic justice, and a culture of peace…” [↑](#footnote-ref-1)
2. …*problema* can signify *projection* or *protection*, that which one poses or throws in front of oneself, either as the projection of a project, of a task to accomplish, or as the protection created by a substitute, a prosthesis that we put forth in order to represent, replace, shelter, or dissimulate ourselves, or so as to hide something unavowable –like a shield (*problema* also means shield, clothing as barrier or guard-barrier) behind which one guards oneself in secret or in shelter in case of danger.” (Derrida 1993, pp. 11-12). [↑](#footnote-ref-2)
3. ATOPIA founding members are David Turnbull and Jane Harrison [www.pitch-africa.org](http://www.pitch-africa.org) [↑](#footnote-ref-3)
4. School of Architecture for All (SARCHA) non profit was initiated by Maria Theodorou and Larry Cool in 2006 [www.sarcha.gr](http://www.sarcha.gr) [↑](#footnote-ref-4)