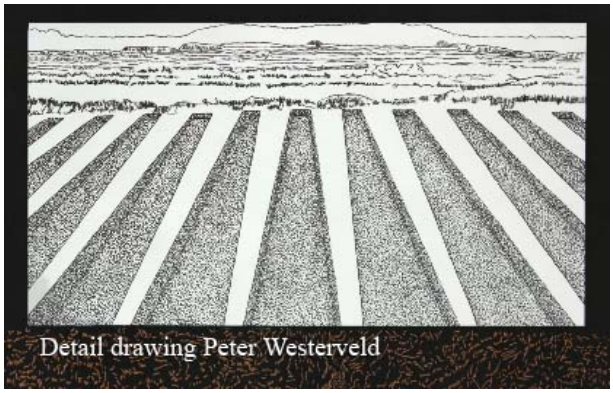
The 'land art' of Peter Westerveld

Peter Westerveld (1951-2014) was born in Tanzania and grew up in Congo on a sisal plantation where his father worked as an agricultural consultant. Being bullied by the Flemish children on de school bus, he chose to walk through the rainforest to school and back. This was his first up close experience with nature in Africa and one that left a lasting impression.

After his studies at the Academy of Arts in Arnhem in the 80's, he returned to Africa to start a safari business in Tsavo East national park in Kenya. There he was witness to the increasing problem of erosion and desertification. He first started small field experiments and next larger projects to stop erosion and store water in Mali, Tanzania and Kenya. Peter discovered that by *contour-trenching* he could break the hardened topsoil on sloping land and store runoff water underground. Downhill he could let water surface again by stopping trenching. On one trenched plot called Olasiti in Amboseli in Kenya for example, water brought subsurface uphill simply appears in the lower lying land through natural cracks in the soil.

In project areas Kitenden and Meshanani, also located in Amboseli, Kenya, he made small reservoirs downhill from the *contour-trenches* to make water available for people, livestock and wildlife the whole year round. Peter was convinced that he could create water sources where he wanted, only by applying his *contour-trenches* on hill sides. By doing so he created hydrostatic pressure in the landscape feeding lower lying water sources. He claimed he could lead water to where it was needed without using pumps, masonry work, or pipes, as these were instruments he abhorred. The *contour-trenches* were aimed at being one-off interventions without any need for maintenance. They would keep their function of water infiltration long enough to allow for the germination of the thousand-fold available seeds, thus the re-greening of the landscape and subsequently a milder climate pattern.

In the floodplains Peter used (cross) *contour-trenches* to bring surplus water of river peek flow underground for the protection of the Irish crossings, fords and drifts. So new vegetation was initiated on the barren levees reducing the erosive velocity over the floodplain and keeping the river flow centered over the structures. A peek discharge of 1 m3/s during 1 hour already provides 3.600 m^3 for storage in 18 trenches of 4x1x100 m at both sides. While the vegetation is settling, trenches would fill-up with sediment.


Detail drawing Peter Westerveld

It is very likely that his positive experiences with the trenches in Olasiti, Kitenden and Meshanani convinced Peter that the effect of these techniques was based on an universal principle and could be applied anywhere. Scientists reacted scornfully, maintaining that the impact of interventions in the landscape is mainly determined by soil qualities and the groundwater level. In permeable soils with deep groundwater, stored water percolates mainly downwards by gravity and can be considered as lost. According to Peter water is never lost; even when it percolates deep down in the groundwater, it will surface or supply the root-zone. May be not everywhere, but somewhere: it's a matter of scale. Unfortunately, it was very difficult, if not impossible, to have any discussion with him on this subject. For him this was part of a learning process: learning by doing. His interventions in the landscape were the ultimate form of art. Not just copying or reproducing life, but actually revitalising life.
However, what Peter Westerveld understood very well was that deforestation in one area could influence the rainfall in another region. These processes are interlinked. The other way around: reforestation in one area contributes to a better rainfall regime in another area, and spontaneous reforestation could take place there as well; making of a turning point between two different system levels.

The *Hydrologic Corridor Project* in Kenya puts into practice this system thinking. In order to influence the rainfall regime over a vast area of 20.000 km^2, he planned natural re-greening by *contour-trenching* in 12 selected locations of 20-25 km^2. The extra evapotranspiration from each of these areas strategically situated in the prevailing monsoon winds from the coast to Mt. Kilimanjaro, would contribute to atmospheric cooling and more regular rainfall in the whole area. This way, a hydrologic corridor was created by many smaller water cycles and the restoration of the ecosystem was realised.

Until recently, developments focused on local stand-alone interventions on agriculture, vegetation and infrastructure. *Contour-trenching* in fact is also such a physical infrastructural work with potential impact on the greening of an area. But by developing these areas in a strategic grid, their individual atmospheric cooling effect will interact and strengthen each other; through an atmospheric chain reaction a massive cool vapour stream towards the mountain slopes is created, causing less extreme and more regular rainfall. All this without pumps, pipes or canals. His vision here was unique, and subject to serious research today: proof of concept.


Aerial shot Kitenden trench system


Aerial shot Meshanani trenches

In Peter's mind, these works have to be implemented at such scale and with such urgency that, in order to be effective, they can only be realised through the force of heavy machinery and of course nature itself. Interventions on the ground like sowing and planting trees would hardly make a dent. Only by atmospheric cooling at strategic locations from coast to mountains, realised by reforestation brought on by *contour-trenching*, it would be possible to bring large areas under a more moderate and effective rainfall regime. Fast, cheap, and large scale are key words here. According to Peter, planting trees is fit for school children and ambassadors.

Revolutionary was Peter's method of formatting the design merely based on scale. This was considered crucial if you want to speed-up work on a large scale. His idea was simple: in order to bring 700 mm yearly rainwater of an area of 10x10km^2 underground, you have to deal with 10.000 x 10.000 x 0,7 = 70 million m^3. Considering 10 rainfall events, then 7 million m^3 soil needs to be excavated which for a 4x1m bulldozer blade is 1.750 km length. With similar calculations the project requirements are easy to estimate.

Peter was heavily criticised for his preference for *contour-trenching* as its effect is very much dependent on local conditions. Not all water flows horizontally into the root zone; water cannot be directed towards the surface on demand. The 'Hydrologic Corridor' is a hypothesis needing a 'proof of concept'. Nevertheless, the underlying ideas are universal and based on generally accepted hydrologic principles. They form a guide for large-scale landscape restoration.

In Peter's view, the climate debate is dominated too much by CO_2 emissions and the role of global deforestation is heavily underestimated. According to him, the best and quickest results can be achieved by large-scale reforestation. In his ideas he considers multiple aspects in the landscape. Not only stop erosion, start reforestation and ensure the water supply, but also protect infrastructural works like bridges and roads, and design more robust culverts and foundations. In his last years, he worked on plans for settlements in desertified regions in Kenya, in order to accommodate people from the over-populated and completely congested cities of Nairobi and Mombasa.

Apart from the above 'land art', Peter Westerveld leaves behind an extensive body of art echoing his love for nature, and his view on the relationship between mankind and the environment. His last work is the 25 meter long mobile installation 'The Hydrologic Corridor, expressing his ideas about the chain reaction of energy and water in a three-dimensional way.

(source: P. Martijn, contributions M. Faber, F. Jaspers)