

**A Wealth of Opportunities
in Southern Africa**

An Emerging Model of Development based on Biodiversity

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*If it is possible, we do it today;
If it is impossible,
it will take a little longer*

Paolo Lugari

History Revisited

Africa is often considered a lost Continent. After the World Summit of Environment and Development which took place in Johannesburg, South Africa, the donor fatigue set in. worse, the public at large seems unaffected and apathetic by the dramatic social and environmental crises Africa is facing. Whereas the data of malaria infections, iodine deficiency and HIV are devastating in the region, Western assistance is dwindling fast. And if assistance is offered, it is tied to Western experts, Western expertise and Western trade. It is against this background that one can consider the need for a new development model, one that is not tailored after the apparent successes of the North, with a living standard that is unsustainable and exploiting the south, but rather a development model that builds on what the region has. And there should be no doubt: Africa has a lot to offer to itself.

The concept of Sustainable Livelihoods was launched by the United Nations Development Programme (UNDP) in the late 90s under the leadership of the Rt Hon Anders Wijkman, then policy director of the UN organization. It was a well articulated initiative that clearly spelt out the need to respond to the basic needs of people assessing in the first place what they have.

It is no surprise that the European colonizer was not able to spot any opportunity in the Kalahari Desert for food, water, health care. The ecosystem is simply too strange and the lack of any reference points did not instil appreciation, or respect for the Bushmen tribes. The efforts from the colonisers to civilise the Bushmen, they have not only survived, but have managed to maintain their connection with nature living in harmony with the environment that has been their home, basis of their tradition and culture.

The Southern African challenge is even more complex. The lack of understanding of the local ecosystems has led to a devastating approach to socio-economic development patterns. Agriculture based on non-native species with non-native techniques resulting in an elimination of the local tradition, loss of indigenous knowledge and the devastation of many indigenous species. This is compounded by the apartheid policy of systematic exclusion of the Africans from the areas of learning, training and developing expertise in basic concepts of agriculture. The same applied to Namibia where no Black student could

enrol in the Faculty of Agriculture. It is no surprise that this led to a difficult transition from a racist economic and governmental system to a democratic empowerment.

The new democratic dispensation however, is caught in a contradictory position of one the one hand critiquing the white regime and on the other hand emulating the white man's approach to farming and agriculture is a quasi guaranteed road to failure. In a globalized agribusiness, the small farmer hardly has a chance emulating the old model.

By applying the concept of Sustainable Livelihood in Southern Africa, a broad range of interesting opportunities emerge. These are simple, clear and beyond doubt. If one were to embark on a discovery of the "hidden connections" between biodiversity, local ecosystems, productive chains and social needs, especially in terms of food security and jobs, one quickly notes the vast potential that has remained invisible for too long.

A fresh look at biodiversity

The Western Cape houses one of the richest biospheres in the world. The Western Cape also happens to house poverty and nuclear power¹ in Africa. This region has everything that one would dream of to secure economic, social and sustainable development. This region has a large part of the population whose basic needs for water, food, housing, health care, energy, education and jobs are simply not met.

There is no doubt that the peaceful end to Apartheid in Namibia and subsequently in South Africa has been a remarkable achievement, serving as an inspiration to many around the world. At the same time, the road to a sustainable livelihood for all has been a long and arduous. When we travel along the Western Cape all the way to Cape Cross, North of Swakopmund in Namibia, one finds the richest biodiversity of lichens, these symbiotic species of algae and fungi that are the precursors of plant and animal life. The rich Benguela Current² is providing just about everything, except rain water.



My first visit to the Cape was back in 1985 when I visited a special friend, the remarkable musician, singer and songwriter Steve Kekana who offered me an insight

¹ ESKOM, the South African electric utility owns and operates the only nuclear power facility in Africa, the Koeberg Nuclear Power Station constructed during the Apartheid regime.

² For more info on the Benguela Current: <<http://www.benefit.org.na/profile/benguela.html>>

into the social drama engrained in the apartheid regime. This visit did not permit me to indulge in the natural beauty and the exceptional biodiversity that the scientists had come to recognize decades and even a century before.

Years of Western farming techniques stressed out many species but thanks to a delicate preservation policy the Fynbos biosphere there are parts of Cape Peninsula that still remains relatively well preserved. On subsequent visits I became aware of the wealth of this unique ecosystem which has the richest biodiversity in flower species with some 450 different plant species³. Slowly a new world emerged in front of my eyes: a world of abundance in a country of poverty. For two decades I have ventured across the whole region, from Namibia to Zimbabwe, from Malawi to Mauritius and developed a deep appreciation of the natural systems, the cultural heritage and the age-old traditions of the people from this region. The past decade I have visited Namibia on two dozen opportunities and learned to appreciate the country and its people.

It soon became obvious to me that the opportunities Southern Africa in general and the Western Cape in particular have to offer are not only new to me. I have met people over the years who have demonstrated a clear insight and a vision of the economy that could emerge in this part of the world. The government officials, the business leaders, the academics and NGOs, as well as the media in this part of the world are all committed to take this region's predicament seriously. In spite of this commitment, how is it possible that one has not succeeded in unleashing the tremendous potential and the opportunities embedded in the natural systems. I realized what is needed is a shift from looking at just one species, a plant, a fynbos to looking at the whole network of hidden connection that represents the wealth and abundance in Southern Africa that including bacteria, to algae, fungi, plants and animals.

The day that the stakeholders in the stretch of land from the Western Cape to the North of Namibia will see through the marvel of this interconnected system, the future of this magnificent Region will be one that the world will be inspired about, as much as it is inspired by its leader Nelson Mandela.

Shift from Species to System

Visiting the coastal zone from Cape Town over Pringle Bay to Hermanus shows the biodiversity of the Fynbos. Here one can enjoy over one hundred different Geraniums (Pelargonium spp.⁴). One can get entangled in the beauty of the coastal zones with its crashing waves and colourful beaches. Emerging wealth of a large middle class vying to own comfortable holiday homes along the beach front is evident. But behind this beauty and richness lies deep poverty of the local inhabitants of the area, the fisher folks. Hidden around the hills is poverty as a result of complex marine policies, over fishing that eliminated the abundance of fish from these rich waters. Worse, the abundance of nutrients from the Anghula (from the Indian Ocean) and the Benguela (from Antarctica)

³ for more info on Cape Peninsula Bio Diversity:
<http://www.southafrica-travel.net/westcape/cape_00.html>

⁴ For more info on 160 different types of geranium:
<<http://19.1911encyclopaedia.org/G/GE/GERANIUM.html>>

currents had created an exceptional habitat for valuable species like abalone⁵ (*Haliotis* spp) and sea cucumber⁶ (*Holothuroidea* spp.) . These animals thrived within this ecosystem only to be discovered by poachers who have cleared the coastal zones in a matter of years. With the disappearance of abalone seaweeds are also lost. These are recycling nutrients in these rich and clean waters so rare on Earth. The depletion of one species in the interconnected chain of resources could thus lead to the excess of nutrients converted into pollutants.

The challenge is to use the insights from solid studies in land and marine botany and -biology to the next level put it into a regenerative and productive system, an auto poetic system. In nature, all species are self-evolving, developing along a path of co-evolution where changes in one effect changes in all, where every niche in the system is occupied by unique species that have adapted and continue to adapt to the conditions that the system provides. Many species are beautiful, beyond our present capacity of appreciation (see Diatoms by Jan Parmentier).



Unfortunately, the Western research facilities paid attention to whatever was “native” to the ecosystem characterized by 4 seasons (Europe), and what could be useful in the context of Europe (Geraniums). Thus the study of seaweeds or diatoms remained minimal, and the dynamic interaction between these species of the animal and protocista kingdoms in most cases non-existent. Whereas this can be considered a disadvantage, it could also be considered a major advantage: there is no need to unlearn. The most recent report on Marine Biodiversity⁷ funded by The National Research Council gave voice to the concern that “South Africa does not have adequate capacity to monitor and manage its extensive coastline and marine resources, nor sufficient knowledge and understanding to conserve its biodiversity effectively”⁸. This report further calls for “a marine biodiversity audit aimed at understanding and predicting the impacts of humans on these resources, and that planning is needed. Otherwise resource control will always be a reactionary, rear-guard action that attempts to preserve the last remaining example of a biological community. The report concludes with a call to establish on a regional basis with long term plans.”⁹

⁵ Abalones are members of a large group of mollusks (Gastropoda) with one piece of shell. They belong to the family of Haliotidae, genus *Haliotis* meaning sea ear, referring to the shape of the shell.

⁶ Sea Cucumbers are related to the sea stars and other echinoderms.

⁷ Durham, B.D. and J.C.Pauw (eds), Marine Biodiversity Status report for South Africa: At the end of 20th Century. National Research Foundation, Pretoria, South Africa, 2000.

⁸ Ibid, page 95

⁹ Ibid, page 88

Just imagine how millions of tons of micro organisms and plankton from the Antarctic and the continuous up welling of currents from the deep sea provide massive flows of nutrients in which everything, but especially plankton and diatoms thrive. Diatoms are basically unicellular. However, many species use several methods to stay together by mechanical means or by sticking together by some sort of paste (see illustrations supra). Other methods are to stay together by making a common tube or by a string that holds the cells together. The colonies can have a size of several centimetres, giving the impression of a small bush and reminding one of brown algae. It is quite possible that staying together is a defense mechanism against grazing, or in some cases (diatoms with a slime cover) to enhance also the buoyancy of planktonic species on which the diatoms thrive. It is a world we are just about to discover.

These diatoms form part of the kingdom of protocista with an impressive beauty of silica-based cell membranes that proliferate in this rich environment that allows other species to thrive. For example, a single female abalone produces 500,000 eggs in this nutrient-rich water, and after fertilization by the male these eggs evolve into larvae. These larvae need diatoms, millions of larvae feasting on billions of diatoms, thriving on trillions of plankton. The larvae quickly shift their nutrients from diatoms to algae and grow on these macro-algae or seaweeds for four or five decades. A forty to fifty year old abalone is one of the most stable agents in the ocean and at the same time one of the most valued delicacies fetching prices that just about match gold. The abalone feast on seaweeds and the five indigenous species of abalone have each carved out its niche in the world of abundant algae. The abalone will never just devour one type of seaweed; it will always look for a fine mixture offering the specific micronutrients that correspond to its niche in the marine world.

Abalone, like most metabolic animal species only absorb a fraction of the algal nutrients into its body. The majority is simply processed through a sophisticated digestive system and released back into the seawaters where millions of micro organisms, and a few macro-species, especially the sea cucumbers (the earthworm of the sea) thrive thanks to the food residues of the abalone that are left astray in the ocean. The enzymatic mix of the digestive system in combination with a rich variety of anaerobic intestinal bacteria prepares food for other species that lies like debris on the ocean floor. If no species were to absorb this waste, it would consume precious dissolved oxygen and thus decrease the vitality of life, reduce biodiversity and that leads to fewer nutrients. The ecosystem is an abundant one indeed. A mismanaged ecosystem can quickly lead to depletion and poverty for one and all.

The Cape Coastal Zone has hundreds of families of microscopic and macro algae¹⁰, some of which take the shape of sea bamboo (*Ecklonia maxima*), a kelp that can grow up to 15 meters long all thriving on thousands of nutrients, some mineral, some organic that are brought from the extremes of the Earth to Southern Africa. The wealth in algae and

¹⁰ The main sea weeds along Southern African beaches are : Chlorophyta (simple green algae, stalked greens, codiums and valonia) Phaeodophyta (simple brown algae, kelps, sargassus-like, bladders and strings), Rhodophyta(falt, membranous, balloon, tongue like, fork branched, gelatinous, spiky and iridescent, branching epiphytic and fine upright coralline red algae) Source See Foot note 11.

seaweeds¹¹ is so overwhelming, and the flow of nutrients into the system so continuous, those abalones nestled on the rocky shores convert massive amounts of nutrients into a delicious meat. This whitish meat is for some an aphrodisiac, but for most is one of the purest nutritious foods available. After all, this mollusc solely feeds on diatoms and algae, and its larvae can only survive in the purest waters of the world. This animal is so rich in trace minerals, of which the iodine reaches concentration levels that with a few abalones a year one would eliminate Iodine Deficiency Disorders (IDD) efficiently, one of the most debilitating illness in Africa after malaria and AIDS. One wonders why we have invested so much time and effort to iodize salt for half a century when this could be substituted with investments in seaweed and abalone farming instead.

Unfortunately, the abalone along the Southern African and Namibian Coast is poached to death! The illegal trade benefits the middlemen, and trick the subsistence fishermen into the destruction of their ecosystem in return for a paltry sum that is barely sufficient for their survival. If one only studies abalone and poaching, the solution that comes to one's mind is a repressive one. "Sustainability starts after breakfast" is so true. If one is hungry and the buyer in Hong Kong offers 100 dollars for a kilo of abalone, it does not take a lot of efforts to mobilize poachers. No police effort can bring this devastation to a standstill. The only event that will stop the poaching is when all abalone are gone. Or when a sustainable livelihood becomes a meaningful reality and is accessible for all.

If we are determined to protect an endangered species through repression only, we are only likely to fail. The challenge, other hand is to adopt a strategy that values every part of the system and combines numerous agendas, with a chance to generate jobs, along with a need to develop a competitive industry based on biodiversity in a sustainable fashion. This would not only help the endemic abalones to survive, the project would guarantee a thriving biodiversity along with a sustainable socio-economic future that would otherwise be lost. This requires not only a long term plan and the cooperation of all stakeholders; it needs vision for a new development model.

Designing Development with Natural Systems

The abalone farming is an interesting case in point. Just imagine these clean and nutritious waters. Just imagine the price the world is prepared to pay for a mature shell. Think of the high level of unemployment and the need to create a sustainable livelihood, while enhancing -and not just preserving- the natural systems. Just imagine a way to address all these agendas with one program while competing on international markets with a unique selling proposition based on local diversity of an endemic species.

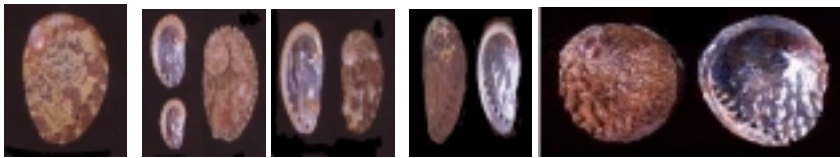
By identifying the endemic abalone species¹² in the waters enriched by the Benguala Current and studying the abalone hatching systems, the first input needed for a competitive production cycle are the diatoms. Diatom farming as of now might be unheard of. Diatoms are abundant in the sea. A careful study of the abalone digestive

¹¹ Branch, G.M., M.L. Branch, C.L.Griffiths and L.E.Beckley: " Two Oceans: a guide to the marine life of SOutehrn Africa" David Philip Publishers, Cape Town, South Africa, 1994

¹² The five endemic species of abalone in Southern Africa are: *Hiliotis midae*, *H.spadicea*, *H.Parva*, *H. Queketti* and *H. Speciosa*. For more information: <<http://web.uct.ac.za/depths/zoology/abnet/species.html>>

system, will reveal the unique niche of each of the 200 odd varieties of diatoms play. One can chart the biochemical needs of each species by matching the nutritional preferences of each species with the biodiversity of the diatoms. These charts simply do not yet exist. This basic research is the key to success and is a first step in understanding the ecosystem. Humans are so linear and so embedded in the Taylorian production mode whereby we expect one species (an abalone) to just thrive in its larvae phase on a few nutrients (diatoms). This is not the case at all. Each endemic abalone has its unique portfolio of diatoms, which have evolved over millions of years to satisfy the specific role that each plays in a precisely defined niche. The creation of sustainable livelihoods depends on our capacity to access the science, process the information that nature unveils if we are prepared to look at the hidden connections, and then translate these into concrete projects.

Photo 2: The Five Endemic Abalone of Southern Africa



The same logic applies to the second phase of growth of the abalone. When there are over 100 species of algae in the ocean, why just feed the abalone a few? It does not make sense. Ever heard of seaweed farming? Yes, there is seaweed farming in Luderitz (Namibia), and seaweed harvesting in Saldhana Bay and Hermanus (South Africa). This is recognized as an interesting area for industrial development, especially in the market for carrageenan (an additive to the microwave food), for agar (a key ingredient in biopropagation), and for cosmetics. But many of the seaweeds are in such abundance that one can simply harvest these along the coast. Since abalone has vanished from the coast due to poaching, there is a need to balance the excessive growth of algae through a regular harvesting. The biochemical pattern of consumption, metabolism and growth of each abalone species can be mapped very precisely with the algae and seaweeds on which it feeds, and this creates an efficient system that goes beyond the present understanding of productivity. This approach can be translated into more jobs, while increasing productivity, a dynamic evolution of the economy that managers and policy makers are not used to. After all didn't the economist teach us that in order to increase productivity we have to sacrifice jobs - all based on the scarcity principle?

The concept of productivity

The temptation of the economist is to decrease employment in order to improve competitiveness, as if the productivity is solely related to labour. But a second obsession of economists is to reduce cost to the bone, as opposed to the entrepreneurial spirit to generate more value added. Reducing costs is bound to reach a limit, after all producing for free has not yet been invented. Increasing value added could easily expand forever; it is only dependent on creativity and imagination. There is simply no limit to creativity, and there is still so much to be learned from the natural systems. As this knowledge

unfolds, it permits us to design new development models. One of these challenges in any farming or animal husbandry is the issue of feed. The strategic option that has been chosen by most farmers, and the solution promoted by many animal feed sales companies, is to have just one feed. These are mixes of waste streams sometimes complemented with additives ranging from antibiotics to hormones and genetically modified enzymes in order to reach maturity faster. This is true for cattle, and that has led to the well known disaster of mad cow disease. Cows are natural grass feeders and their digestive system has not evolved for digesting bones.

When we believe that the case of cows and cattle were an isolated one, then the reader will be disappointed. The search for productivity through this waste recycling game is true for shrimps. Shrimps are originally algae feeders and now have to devour slaughterhouse waste, fish meal and even the waste from other shrimps! This has led to the white spot virus. This is unfortunately also true for pigs, which suffer massively from hoof and mouth diseases. In Southern Africa it is normal to feed the leftover legs of ostriches to chickens! Chickens are born vegetarians. None of these animals farmed at great scale have “a menu to choose from”. Agribusiness (as opposed to agriculture) has opted for specialized feed that achieves one goal: fat for faster slaughter!

Animals in the process of this insatiable search for productivity are forced to eat whatever the feed industry can lay its hands on cheaply. That is why slaughterhouse waste is converted into feed; that is why process waste from fisheries is converted into feed. All in the name of productivity. Ever noted fishy taste of pork? Ever wondered why shrimps are so white and tasteless? This focus on productivity is not limited to the production of feed, where waste is converted to feed. Now the search for ever higher levels of productivity has led to the artificial procreation of animals itself. Take the advent of tilapia farming in Southern Africa and elsewhere in the world. The *Tilapia mozambica* originated in Mozambique, as the name suggests. But it has been genetically modified and crossbred that in the end the little fish that grows quickly to maturity providing a nice white fish meat is only “competitive” on the condition that all female fish are neutered or converted to males through a hormonal treatment. The process is only “competitive” if a dedicated feed is purchased (from the same supplier of the fingerlings) which is totally strange to whatever the original fish in the Mozambican rivers was enjoying.

It is against this background that we have to understand the need to embark on a new and much higher type of productivity. This responds to the desire of the Western consumers who not only want to know what is not in the food ¹³, but who finally want to know what did get into the food chain. This is also an absolute need for those who are to design a strategy to offer sustainable livelihoods to the un-reached in our world.

We propose that when there is such a wealth of nutrients and biodiversity as is available in the pristine water world of Southern Africa, then productivity has to be based on

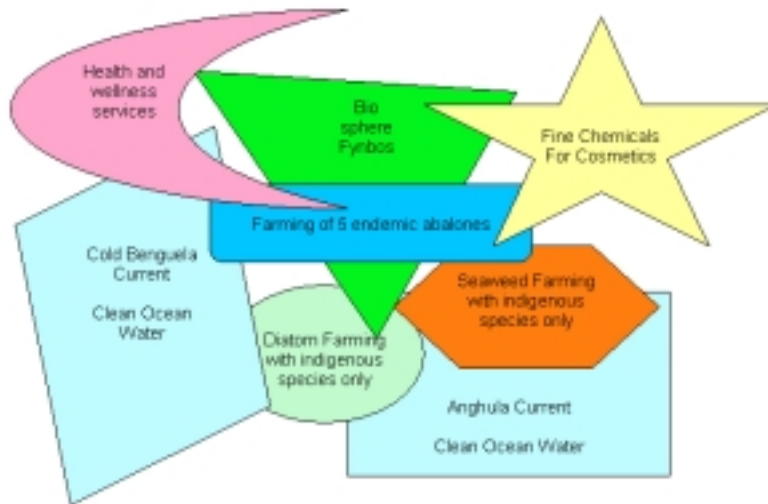
¹³ Certified Organic means that no pesticides, herbicides, artificial fertilizers. This basically guarantees what is not there, but does not yet spell out what is in the food chain that produced it.

biodiversity. The temptation to increase productivity in abalone farming by adding fishmeal should be discouraged. As this industry is just emerging in Southern Africa a law should simply ban it. Fishmeal is rich in indigestible protein that no abalone has ever tasted, and lacks the enzymes to digest. The provider of the fish feed mixed with seaweeds may pretend that the farmer will enjoy a faster rate of production and better rates of return. At the same time this is a quasi-guaranteed strategy to get mad abalones -la - mad cow disease and a faster way to perpetuate the crime and grime of abalone industry.

When the farming of seaweed takes a new turn, a region like Southern Africa should not be satisfied with the mere production of feed for abalone, but should rather focus on producing a wide range of fine chemicals for the cosmetics industry. Upon assessing the real value of seaweed, one realizes the numerous quality ingredients highly sought after by the health and wellness industry all available from the rich bio-diverse flora, fungi and algae in the region.

It would not be difficult to imagine a strategy whereby one creates an indigenous business, home grown and based on local diversity. It is important to formulate an uncompromising strategic approach. The active ingredients are available locally, and the preservation and filling agents should not be imported from Europe or America. The non-active components (e.g.paraben,¹⁴ methyl 4-hydroxybenzoate) are more expensive than the natural active components and these traditional European chemical ingredients have never been cleared of their possible linkages to various illnesses.

Graph 1: Sustainable Livelihoods based on Biodiversity



¹⁴ Linkages between Methylparaben and breast cancer refer: <http://www.mindfully.org/Pesticide/2004/methylparaben-Deodorant-Cancer12jan04.html> and the report by the Canadian Government in http://pubs.nrc-cnrc.gc.ca/cgi-bin/rp/rp2_abst_e?cjz_z99-26078_ns_nf_cjz

This article does not pretend to lay down the definite rules about farming abalone or the emerging business of fine chemicals for cosmetics. It merely likes to spell out the opportunities that generate so many spin-offs meeting important agendas in terms of sustainable development all at once.

In order to demonstrate that such an approach can while preserving biodiversity can generate jobs and multiple opportunities for business, let us develop a few other potential cases for industries exploring sustainable livelihoods through piggeries, breweries and wellness tourism in the Southern African region. This is merely pinpointing towards the opportunities, but as an entrepreneur, it does matter to see what can work and what will offer a unique selling proposition. It is a matter of making it happen along the adagio *“If it is possible, we will do it today; If it is impossible, it will take a little bit longer.”*

Health and Wellness Tourism

Ecotourism has been slated as the solution for the developing world. And with ever decreasing cost of international flights, the possibility to enjoy a holiday on a far away beach or mountain has become a popular option indeed. Though time has come to look beyond mere game safaris and eco-hotels on the beach. Time has come to engulf oneself in the wealth of biodiversity, enjoying the rich varieties of flowers, herbs, seeds and roots, while at the same time strengthening one’s immune system that has been so debilitated with unhealthy living style that characterize the Western cultures. It is stated correctly that too many Westerners are prepared to sacrifice their health in the first half of their expected life in order to earn a lot of money, only to be prepared in the second half of their life to sacrifice all that money in order to gain some of that health back. Most of the time, it is paradise lost and can never be regained.

The step from ecotourism to a wellness initiative that is embedded in biodiversity and the natural living conditions is an exceptional opportunity that is only now emerging. The missing link was the deep connection with the traditional and cultural connection of the native tribes of Southern Africa with their land. The westerners seem to finally be prepared to accept the tremendous wealth in health, vitality and beauty that is embedded in these dry savannahs where the Bushmen, the Damara and the Ovambo survived for millennia. Just imagine having a fresh clover drink for breakfast, a natural bomb of Vitamin C, harvested from the shades of the savannah where thousands of animals graze freely. Enjoy a fine steak or a fresh sausage from free grazing kudus and oryxes, spiced with fresh basilicum and rosemary, accompanied with wild asparagus followed by a aromatherapy session using each day a new blend of geranium (remember there are 160 species) and newly found varieties of jasmine that perfume the land when one takes a walk¹⁵. Have reflexology session in the dry open air that brings relief to the arthritic pains, and cleanses the lungs revitalizing deeply. One realizes that the Bushmen survived here for thousands of years in conditions that were considered harsh and even inhuman, and grossly misunderstood by Western civilization.

¹⁵ A landrover safari never allows a glimpse of such wonderful treat to the senses that one gets from walking where possible observing in close proximity nature’s abundance.

Photos 3: Biodiversity at the Cocheganas Lodge by Windhoek, Namibia



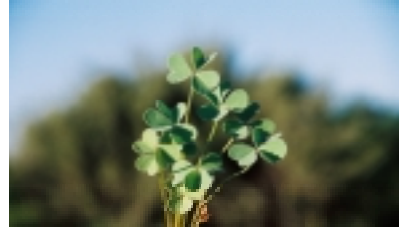
Amaranth Photo: Pauli, 2004



Wild Sage Photo: Pauli, 2004



Cat tail Photo: Pauli, 2004



Clover Photo: Pauli, 2004



Wild Geranium Photo: Pauli, 2004



Wild Rosemary Photo: Pauli, 2004

A walk through the savannah, instead of a mere game drive, opens your eyes to the beauty unfolding in hundreds of plants and flowers we simply never see in that brownish soil. This walk opens your nostrils as your olfactory sense is exposed to such a variety of smells that one wonders how we could ever have replaced such the wealth of perfumes with synthetic creations. Textures and tastes of leaves stimulate your taste buds driving anyone to a desire to enjoy the senses, instead of simply dulling these with salt and sugar. A few hours in these abundant nature is enough to convince anyone that the combination of tantalizing smell and taste, while revelling beauty, is simply beyond anyone's imagination. The best part of the news is that each of these plants, flowers, fruits, leaves, roots and twigs have a unique medical value we can only discover if we can gain the trust of the people who are from this land and are prepared to listen. This is a major challenge for the development expert: listen and be prepared to learn from those who may not even be able to read and write.

How many places on Earth can one create such an experience? How often are we not simply transplanted from our air-conditioned offices and homes to air-conditioned hotels where we cannot fully appreciate the health and wealth of natural systems? How many chances do we get to devour the magnificent sunset, simultaneously with the overpowering moonrise while there is not one artificial light diminishing the brightness of these dominant forces in our skies? It is here that one can experience the power of

the full, the rising and the descending moon, and its effect on plants and animals (including the human species). It is here that one can reconnect with the capacity to respond to all, with what is available, while providing abundant opportunities to appreciate how inventive natural systems are when rainfall is limited to a few days a year. It is here that we can combine our personal health from within, with our understanding how we connect with the system in which we live, and the universe that soon emerges as a multiverse (there are many universes, not just one ...).



Coheganas Wellness Centre

Photo: Pauli, 2004

The Stritter family has been dedicated to the Namibian wildlife preservation for decades. The Coheganas Lodge¹⁶ is the culmination of 4 decades of preservation of delicate savannah along the Auer Mountain range. The combined land area is some 16,000 hectares with a total of 6,000 animals, ranging from gemsbok and antelope, to wildebeest and giraffe, while a few elephants and the largest Namibian herd of rhinos secure the regeneration of species which are on the brink of extinction. In this unique area, the endangered animals are bred and transferred to other parks, and those which are not at risk are available for the highest quality meat processing that is available anywhere in the world. Kudus, impalas, springbok and gemsbok which are in abundance and procreate generously on the rich land (see Photo 4).

The mad cow disease has made many to become vegetarian. Others wonder how the production of meat for human consumption could ever have degenerated to the point that cows were forced to eat the left-over from slaughterhouse waste which is contrary to the natural principle that stipulates *“waste of one kingdom shall used as a nutrient for a species belonging to another kingdom”*. If one forces species of the same

¹⁶ For more information <www.coheganas.com>

kingdom to continuously eat left-over from the same then this species will degenerate.”¹⁷ Here in Coheganas there is no basis for a massive export machine of meat and sausages. Though it does represent a perfect mix with the strategies for animal husbandry and meat processing designed by Karl-Ludwig Schweisfurt as part of the Hermansdorfer Landwerkstätte.

Mr. Schweisfurt made his name by building up one of the largest sausage makers in the Europe. The Herta company was purchased by Nestlé and this newly gained freedom permitted Mr. Schweisfurt to search for a new dimension in his life: how to produce meat in a sustainable way, how to slaughter animals with dignity and process the whole carcass while it is still warm, avoiding all these deep-frozen transporters and offer a product of quality. The first integrated farming system was implemented in Glön by Munich and this offers a unique reference in the industrialized world. Through the meticulous design of every part of the system, as German engineers are most capable of doing, the overall process reaches high levels of efficiency and remarkable quality. It is these systems that combined with the extensive natural grazing and farming that would make Coheganas into an exceptional provider of quality meet and sausages. Those who visit the Lodge will be spoiled with the freshest and tastiest steaks ever, while the European distributors will have jewels on their hand. With a production capacity limited to 2,000 animals per year this would not at all satisfy demand for meat in Europe or the USA but it would once more create a new niche for sustainable animal husbandry that is as close as one can gets to the Bushman who lived off the land for centuries.

Countries like Namibia and South Africa have all that is needed to bring the best from the Ocean and offer the best from the Land. Here one can indulge in the most effective cleansing systems based on sea algae, the most impressive immune boosters based on essential oils and mushrooms, the most varied food based on wild game offering a glimpse of taste that meat represented to the hunter gatherers and connect with the culture and tradition of the people who were considered by the colonizers as savages, only to realize that the savagery resided deep within the colonizer's desire to carve the rest of the world, in the name of civilisation.

The experience of wellness, for oneself and the Earth, is both filled with deep joy and pleasure, while it offers a humbling experience of where we are and what we know these experiences will reconnect us to the Earth and will hopefully shift the Westerner to embrace a more sustainable style of life while at the same time offering a livelihood for those who cannot even meet their most basic needs today.

Starting with a sow and her manure

Karloff, a young aspiring pig farmer from Malmesbury claimed, "I am a small farmer but I want to be a big farmer." His logic was simple; he is the only one of his family - a clan of 116 adults who has a piece of land as the only hope for creating food security and jobs for those who can work on his land. His dream is never going to materialise if he were to remain a subsistence farmer with one sow. His only option is to become a big farmer

¹⁷ Details on the four design principles of nature defined by the author refer, “Upsizing”. Order the book through the ZERI website <www.zeri.org>

emulating the production techniques of large piggeries. The road he must travel to achieve a large piggery is one of debt and modernization including artificial insemination and hormonal treatments, antibiotics and much more. This approach to growth guarantees that the income he generates by selling 6 month old pigs will be spend on the credit offered by suppliers of the hardware and feed. There is little if any that will ever reach the pockets of his extended family. Before he realizes, the bank concludes his inability to repay debt and foreclose, shattering his dream of becoming a big farmer generating jobs for his extended family. A program of redistribution of land, that inspired him to take risks and embark on a strategy of hope, may thus end up in despair and nightmare.

To suggest that Karloff embarks on a natural process, or an organic farm, if he is to make ends meet is not so easy. He has to get out of the box. That is not so difficult for him, since he wants to succeed and intuitively senses that the way to become a competitive big farmer is not possible by merely imitating the big farmers. It is very difficult for all the wise men to advise Karloff to get out of the box. The world of farming is so dominated by white man who learned their lessons in the universities located in the parts of the world characterized by four seasons and a lot of wealth. These are the experts who will propagate the green revolution, who will speak in favour of genetically modified plant and animal species convinced that this is the only way out of poverty. There is no realisation that the farmer is becoming totally dependent on external inputs - from patented seeds to be purchased each planting season; fees to be paid to the veterinarian to artificially inseminate the sow. Karloff will soon realize that organic farming for export requires certification of his land, consultants fees for the pre-assessment of the land; all at a cost he cannot afford combined with his plight to attain a living for himself and his fellow family members.

Another solution starts with the feed for the pig. A subsistence farmer can only dream of the quality feed that is sold on the market and often has to resort to agro-industrial waste streams such as spent grain from breweries, to potato and tomato skin from food processing, and even left-over from fish filleting and slaughterhouses. The farmer may just have to pay for transport, but his productivity will remain low and his animals prone to illnesses. The veterinarian will be more than happy to blend a good antibiotic into the feed .This does not deal with the poverty crunch.

Another alternative strategy emerges that is self evident. These are options inspired by the Chinese animal husbandry, based on the integrated bio systems. These options have kept the most populated country in the world well fed for centuries, even at times when foreign experts announced hunger. The feed, ranging from spent grain to simple dried elephant grass collected at the farm or the roadside can first serve as a substrate for mushrooms. The moist biomass is simply covered by a black plastic for a few days, after which it is packed into plastic bags, which are inoculated with edible, preferably local mushrooms. The temptation to embark on a farming of white button mushrooms needs to be discouraged from day one. Indeed, Africa has about 20% of the world's biodiversity of mushrooms and a long tradition of complementing the shortfall in harvest with mushrooms, why should the farmer consider producing a non-native species from a temperate climate?

The mushrooms convert the biomass into a quality product, first through the generation of fruiting bodies (i.e. the edible mushroom) and second through the conversion of a low quality feed into a high quality feed rich in essential amino acids that are much needed by the sow and her piglets. If one understands the biochemical processes of mushrooms, and if one has a sense of the potential nutrients that the biomass offers, one can chart (just like with the diatoms and the algae for the abalone) the optimal nutrient cycles. That is not hard to do but seldom done. Just imagine that the farmer is able to match the local biomass, with local mushrooms in order to have the best feed for his pigs on the basis of what the local bio system is generating. This is a first step on the road towards sustainable livelihoods.

By now the subsistence farmer has overcome his dependency on the supplier of the feed; he is now able to generate better and healthier feed at a considerably lower cost. And the pigs will generate manure creating yet another source of income. The banks can be encouraged to fund a bio-digester so that the unutilised manure can be captured to generate biogas, enough to cook meals for the family, while securing a sanitation system that is much needed with pigs. The slurry that emerges from the digester can be used as a fertilizer for perennial plants, and the excess water can be used to farm some algae which bring another set of much welcomed feed additives to the pigs.

It is useful to note that all this is simply based on existing waste streams, which under previous circumstances rarely generated a cash flow. The scenario is one of upsizing, abundance, generating food, nutrients, additives and energy to the farmer at lower cost and with a higher level of flexibility. This is a development that may not yet guarantee the livelihood for all 116 adults but is certainly avoiding foreclosure, or accumulation of debts, interest and falling into the trap of supply contracts of low quality feed with questionable health effects on animals, while at the same time struggling to compete with the large-scale operators.

The future depicted here does not depend on providing the farmer with external technologies and expertise; it depends on his capacity to discover the hidden connections between pigs, fungi, bacteria, algae and plants; something that is not taught at the faculty of agriculture anywhere in the world. The first one to recognize the impact of these connections will be the banker since he/she will understand the reduction of costs and the improvement of cash flow, which in itself represents a lower risk and better credit-worthiness of the farmer! Over the years this farmer can emerge as a competitive force to the traditional white farmer specializing in mushrooms and pigs never realizing that there is a connection between the two.

The European experts, who have not even been able to address the massive pig manure problems on that Continent, are subsequently advised not to discredit this system because they do not understand it, rather they join the learning experience, drawing families out of poverty crutch.

Education is the Starting Point

Prof. Lazarus Hangula, the recently appointed vice-chancellor of the University of Namibia (UNAM) confided that the government is increasing pressure on UNAM to create a learning program at its Faculty of Education for primary school teachers. What is the use of dedicating so many funds to educating at the university level when no solid programs are in place to reach out to the children enrolled in elementary schools?

The educational system for the Africans under Apartheid was non-existent. Whereas the governments have invested major resources to bring education to the people, the overall performance, especially in science and maths remain well below average. If one wishes to prepare the next generations for a production and consumption system based on local biodiversity, then one has to have the scientific insights and the traditional knowledge to design solutions that are ideal for what is available.

The traditional learning was very much based on storytelling around the fire. In a community where social housing is reduced to concrete block houses with a corrugated fibre-board roof and the hope of being connected to a flush- toilet, there is not much room for fairy tales and fables in the front yard, which transfer historic knowledge from one generation to the other.

It has become imperative to expose children to the heart of African knowledge ranging from "Why does the zebra have black and white stripes?" "How does the chimney of the termite work?" "How does the hippo maintain its pink colour?" "Why can't the elephant ride a bicycle?" "How can one farm with ocean water?" or "Which is the oldest plant on Earth and how did it ever come to be?"

Africa is struggling to create an African-based science. To complicate the matter, Africans seem to lack the self-esteem to believe that they can imagine, design and implement solutions based on the best of the African wisdom - in the spirit of Ubuntu.

It is with this strong belief that Southern Africa has a bright future capable of meeting all its needs, that the ZERI Foundation is determined to develop programs along the lines described making a small contribution towards the shifting paradigm. On the basis of a decade of experience in the region, there is an agreement amongst the members of the ZERI Foundation in Southern Africa to focus on action, to build on what is locally available and to empower the young to be their best.

About the Author

Gunter Pauli (1956) was born in Belgium but resides in Japan since 1994. Trained as an economist with a Master's degree in Business Administration from INSEAD (Fontainebleau) he is proud never to have worked for anyone but himself. At the age of 37, after having started 7 companies of which 2 went under, he decided to leave the world of business and focus on the search of innovative solutions for pressing problems of our times through the building of a network of academics and scholars who contribute with insights, experience and science, while maintaining a clear focus on implementation. Gunter believes that the best scientific method is trial and error. There are dozens of projects around the world with which he has been associated. Gunter likes to describe himself as an enzyme, making it easier for others to do more than they ever expected. Gunter is Professor Industrial eco-design, faculty of Architecture and Science, at the University of Torino (Italia) and has received an honorary doctorate. Gunter advises governments and corporations while dedicating most of his time to reach the un-reached.

Nirmala Nair is from India but has been living in Cape Town since 1992. She has a Masters degree in Sociology from India and a Masters degree in Development Studies specialising in Gender and Development from the Netherlands (ISS, The Hague). She is an avid critique of mainstream linear developmental models. Her own non-linear development has given her a diverse background ranging from yoga, Ayurveda, studying indigenous medicinal plants. She creates custom-made personal transformation workshops for groups including corporations using an eclectic blend of what she refers to as sustainable strategies for transformation. Her current passion is getting ZERI-Southern Africa off the ground.