

**Kevin Finn – Editor, Open Manifesto magazine editor:** As with many countries in the world, climate change is a big public concern in Australia. Currently, there is fierce debate about introducing a carbon tax on the greatest emitters. A recent *Productivity Commission Report* has provided data on policies from other countries that are also looking at various ways to tackle climate change. This has boosted the government's resolve to introduce the tax, but the *Productivity Commission Report* also highlights a “deeper picture that abatement policy around the globe is inept, inefficient and often ineffective.” Political posturing and big business lobbying are a constant hindrance to implementing anything serious and sustained, but do you feel a carbon tax is a good way to, at least, actively begin tackling climate change, or is a tax of this nature too focused on fossil fuels alone?

*Allan Savory, President of Savory Institute, Holistic Management expert:* Personally, and for a number of reasons, I don't like the very idea of carbon trading in such a serious situation—reasons that I do not see in the current public discussion.

The underlying idea concerns me because the principle seems to allow carbon emissions from one source (fossil fuels) to be sequestered through practices on the land (agriculture). This assumes most of the climate change—that we unquestionably face—is due to fossil fuel emissions. But it is in direct conflict with reality when we consider agriculture is contributing as much to climate change, and possibly even more than fossil fuels.

Let me explain this, as I did recently in my keynote address at a United Nations conference on desertification and climate change in Bonn, Germany. In that address I began by laying out the situation. Here are the points I made, and which I believe no informed scientist would argue:

- I bring you good news and greater cause for optimism than at any time in history.
- First though let's look at the position: Agriculture is the production of food and fibre from the world's land and waters.
- Agriculture made civilization possible, but also destroyed many civilizations and caused the great man-made deserts of the world.
- Currently agriculture produces more eroding soil, by far, than food every year, and the threat to civilization is now a global one.
- Taking into account that factory farming; loss of carbon from soil that is damaged, as well as lost soil; annual burning of billions of hectares of grasslands; periodic burning of forests and the resultant desertification; frankly agriculture is probably contributing as much—or even more—to climate change than fossil fuels.
- We have to note that most of today's floods, droughts, poverty, social breakdown, abuse of women and children, and violence, are due to desertification that has nothing to do with fossil fuels and was occurring thousands of years before we discovered coal and oil.
- Finally we cannot ignore the fact that climate change will continue in a post fossil fuel world, due to agriculture, unless we address the agricultural situation. And we cannot develop globally sound financial or economic systems without regenerative healthy agriculture as the foundation (because all wealth that sustains any community is ultimately derived from the photosynthetic process—that is: plants on regenerating soils).
- All that I have summarised here, I do not believe any informed scientist would argue.
- So why are we not more aware?

– Possibly, more than anything because our science has been reductionist and management—especially of agriculture—cannot be reductionist in a holistic world.

I went on to describe how, in our reductionists mainstream scientific view, we see biodiversity loss, desertification and climate change as three separate issues—always dealt with by different conferences, organizations, etc. The reality is our world is holistic in nature. Without biodiversity, loss desertification does not occur. Desertification, on the scale now engulfing the world, will alone change climate. But this is, of course, being rapidly accelerated over the last couple of hundred years by excessive use of fossil fuels [which is made from] past biodiversity. So whether we like it or not—biodiversity loss, desertification and climate change are one indivisible issue.

From there, I explained that mainstream scientists, media, environmental organizations, etc, are showing little or no awareness that climate change is being caused by agriculture *and* fossil fuels. And of the two, agriculture is the more dangerous, because it will continue climate change post fossil fuels.

I pointed out that the recently appointed *Commission on Sustainable Agriculture and Climate Change*, chaired by Sir John Beddington, had immediately and publicly warned that agriculture would need to adapt to climate change! It's like the frog in a pot of water—which has been put on to boil—being told to adapt!

Next, I pointed out that humans, including all scientists, use a core decision-making framework in which all conscious decisions, actions, policies, projects, etc, are formed to achieve an objective or goal. And that no matter what profession any scientist has trained in, from any university in the world, they would unknowingly only be trained to use three tools to address global desertification/climate change. Those three tools are: Technology (in it's myriad forms), Fire or Resting Land (non-disturbance).

Of these three tools, with which scientists and climate scientists, etc, are addressing desertification/climate change, two lead to desertification (fire and resting land) and the third (technology), even in the most imaginative form, cannot reverse desertification, and thus climate change.

This is because where resting land or oceans will restore biodiversity over time, it has the opposite effect in low and seasonal rainfall environments, which constitute most of Earth's land area. These are the vast desertifying regions in the U.S., Australia, China, Africa, Middle East, North and South America, etc, where we have to restore rapid biological decay of annually dying plant material. Only one thing can do that: Large herbivores in vast numbers and herds. This means mainly livestock today. But livestock as we know are vilified by environmental organizations, *United Nations*, media and you name it—vilified almost as much as oil and coal [due to their methane production].

I did point out that it is imperative that we find benign mass sources of energy and mobile energy for transport with the utmost urgency in order to curb emissions from fossil fuels, and this is the arena of high technology. There is no imaginable low-tech answer at present. However the contribution of agriculture to climate change is, essentially, a low-tech area where I believe we have most of what is needed now.

**K.F: You cite agriculture as being a major contributor to climate concerns, but how can this be resolved when another major and serious issue for the future is *food*, particularly in relation to rising global population and increased demand?**

A.S: We simply have to recognise that agriculture cannot adapt to climate change, which it is certainly helping to cause along with fossil fuels. The simple fact is that we have to start producing more food that doesn't involve eroding soil, as is the case today. There are no alternatives or options, and the sooner denial, and confusion from corporate and institutional scientists, ends the faster we can tackle the problem.

Fortunately most of the knowledge required is available in the various organic or sustainable agricultural organisations and practitioners. It is also available in my [organisation's] own work in reversing desertification over the bulk of Earth's land area, combined with our ability to enable governments to formulate sound policies using the holistic framework. And clearly we will need to stop the unwise practice of feeding the bulk of grain produced to

livestock; livestock is so desperately required to remain on the land in vast quantities in order to help end land degradation.

All this isn't easy to explain in short sound-bites, as people seem to need these days. But it is relatively easy to begin planning, once we put this whole matter of human survival on the war footing, which we should be doing. When we finally take the matter seriously, and put it as required on a war footing, we will also have to change our financial and economic systems, and also measure economic health.

Obviously—in a finite world—we cannot continue current financial fancy-footing to meet our expectation of constant growth in material terms alone. And any future economy will need to be built on a foundation of agriculture that not only produces food, but provides the only true source of long-term wealth that can sustain any nation.

**K.F: Even though the term 'sustainable' has developed—for better or worse—into a mainstream catch-phrase, would you agree the phrase itself is a myth, if not a dangerous mindset, considering it seems untenable to *sustain* our current practices? Further to this, does mainstream media have a greater role to play in helping to better educate about these particular issues; are documentary films like *The Inconvenient Truth* helpful?**

A.S: I do not like the term sustainable, but prefer 'regenerative'—a term introduced by Robert Rhodale [an American adherent of organic farming and gardening]—when applied to agriculture.

Frankly, sustainable has been trivialised and has become pretty meaningless, as a result. I regularly find ridiculous projects without the slightest chance of being sustained, but which claim to be sustainable simply because it's a buzzword, useful in raising funds, etc. Currently the mainstream media simply tends to reflect the mainstream institutional views and this really isn't helpful. The true leaders of society are freelance writers and smaller interviews, etc., outside mainstream. That said, every now and then mainstream media does investigate new scientific insights and counter-intuitive thinking.

Documentary films are wonderful but, currently, even these reflect the mainstream paradigms. We see great films about charismatic species in the biodiversity loss field, but rarely, if ever, see the simple facts that, without biodiversity loss (from the simple mass of dead plant litter and micro-organisms) man-made desertification would not occur. There are great documentaries on desertification but, again, they reflect mainstream beliefs, not science.

*An Inconvenient Truth* was effective in creating greater public awareness of the serious nature of climate change. However, the entire emphasis was that fossil fuels are causing the change. I found no mention that agriculture is causing as much impact, and possibly more, than fossil fuels. Nor did it mention the reality that biodiversity loss, desertification and climate change are inseparable. There was no mention of the vast biomass burning that takes place on billions of acres annually in the grasslands that are generating desertification.

Al Gore is not to blame, because he was obviously being advised by mainstream institutional scientists and thus reflected mainstream beliefs. Perhaps as we get beyond denial we will place this entire issue of global environmental degradation on a war-footing, and finally get beyond simple trotting out the same old beliefs. Only then will we finally be able to address desertification/climate change.

At some point the media has to help get the word out that only livestock, properly managed and in far greater numbers, can now do what is required to reverse desertification. Since this view is counter-intuitive, although strongly supported by sound science, we cannot expect mainstream media to touch it and risk ridicule until we get beyond denial and face harsh realities.

**K.F: Equally as important as media—if not more important—is big business, which is also required to get on board, in realistic terms. The challenge is always the narrow focus of business, which is generally only concerned with the bottom line, growth and profit-making. I accept that you aren't supportive of a carbon tax, but it is my understanding that a carbon related tax on the biggest emitters will help generate innovation in renewables and green technologies as a means for those businesses to side-step having to pay a carbon tax, particularly—but not exclusively—businesses involved in the resources sector, which mine the earth and**

**therefore impact the soil and land's ecosystem. Although dealing with fossil fuels is only part of the picture, doesn't this approach take a necessary step—a catalyst, if you like—for big polluting businesses to regroup and seek alternative means to produce their products or services with a lighter footprint? If successful, couldn't this model then perhaps be applied to agricultural industries, too?**

A.S: Although my private view is not supportive of a carbon tax, I do not publicly condemn this approach because every little step forward that alerts people to climate change is important. Apart from reasons previously stated, I fear corporations paying a tax are simply passing it on to consumers as a business cost, while continuing to pay obscene salaries and bonuses with the aim of earning obscene profits.

So, ultimately, corporations will ensure the general population is once more paying the environmental costs of their doing business. And I fear governments will not use those monies wisely, because no government at present has the capability to reverse the desertification that is playing such a major role in climate change over the greatest areas of Earth's land surface. Planting trees, which usually becomes the promoted way to tackle climate change, doesn't do what is required over most of the land because rainfall is too low to sustain full soil cover under trees.

For example, I recently heard about the wonderful results of agro-forestry in Niger at a *United Nations* conference on desertification. Wonderful work that I truly support. However when I asked the speaker what percentage of Niger has adequate rainfall for what was being demonstrated; it turned out to be 11%. What of the rest? And when a speaker reported on similar wonderful results in Kenya and stated that Kenya was soon expected to mandate 100% of farms will have such practices with 10% tree cover, I asked what percentage of Kenya has high enough rainfall for such farming. The answer was 15%. What of the rest?

At some point we have to get serious about desertification, which means reversing it over our vast grasslands and savannas of low rainfall. Something that can only be done managing grasses, and using livestock that are correctly managed. Being counter-intuitive, and with livestock vilified almost as much as fossil fuels, no government will address this issue till there is massive public education. This is because both institutions and democratic governments never lead new paradigm-shifting scientific insights till public opinion shifts. Research and centuries of experience prove this.

**K.F: Are we looking at a bigger cultural issue here, considering the insatiable consumer culture and general consumption rate of the global population, which the design and advertising professions unfortunately helps propagate? Or is it a case of introducing better consumer goods and services that can meet the rising demand, but also contribute to reducing climate change? For example, are you familiar with the *Cradle to Cradle* philosophy, developed by architect William McDonough and chemist Michael Braungart, where one of their basic principles is *Waste = Food*?**

A.S: I am fully aware and supportive of Bill McDonough's great work, and we need to shift to such practices on a vast scale to reduce our current insatiable appetite for environmental destruction and waste. In so many walks of life and in our economies we need to begin mimicking Nature's millions of years of tried and tested principles in commerce and industry—just as we are doing in successfully reversing desertification with holistic planned grazing, which is mimicking nature.

Yes, we are looking at vast cultural problems and a need for fresh thinking. We need to engage rapidly in orderly planned changes in our ways. A number of wise and far-sighted people globally have been pointing this out for some time.

However, like my own work, they too face enormous problems—the normal denial that humans practice in the face of looming threat; the orchestrated confusion by some major corporations (just like the tobacco industry did); the mainstream economist fairy-tale world, in which economies cannot be sound if they are not showing constant growth in a finite world. And then there is agriculture, which is ultimately the foundation of all economies, producing more eroding soil than food while population growth continues.

The choices are clear—either governments or people unite globally and put these issues on a war-footing to work out solutions as rapidly as we can, or we continue in denial and orchestrated confusion till we face the issues realistically at far greater cost to humanity. If we leave these issues until a point where denial is no longer possible, apart from the far greater suffering and cost to humanity, we risk the possibility of being too late. That is not alarmism on the part of the people warning, but just sound knowledge of Nature's functioning in what are called *feedback loops* that, once started, tend to gather momentum in a runaway manner.

**K.F: Considering the constant lobbying from various sectors against real action on climate change—and which you and your colleagues have been the victim of—are we suffering from a culture of short-term self-interest: Corporate, economic, political, materialistic? Do you think we will ever move toward—what many call—a culture of 'enlightened self-interest,' where those very same self-interests highlighted above can actually be channeled into a greater good for the planet, and all on it?**

A.S: We can only hope humans survive long enough to begin to make all daily decisions in our lives and in business, community and governments in our enlightened self-interest. Currently we do not do so, not because we are bad, evil or foolish, but because of the way all conscious decisions are made by all humans and have been since our evolution. So even those actively lobbying in denial of anthropogenic climate change—in what they believe might be their business's self-interest, academic ego self-interest, or any other self-interest—they are accidentally acting against any enlightened self-interest for them or their families.

We could look at short-term self-interest versus long-term, but in doing so, we soon realize that any action in short-term self-interest that damages us later cannot actually be in our self-interest, at all. Once we acknowledge this, it is not a great leap to understanding that any decision or action that we take that damages another human or the environment is unlikely to be in our own long-term self-interest.

I know religions have tried to get people to act outside their self-interest, but all humans, including those doing the most good for humanity, I believe act in their own self-interest. I know, that having devoted my life to trying to help others, at times at great cost, I have only acted in my own self-interest. I simply cannot live with myself not doing so and thus every action helping others has been in my own interest.

The problem today is *unenlightened self-interest* and all of us are guilty of such actions, including the saints throughout history. This is simply because the core decision making framework (discovered in 1984) of humans has two flaws that make environmental damage almost impossible to avoid in our daily actions. The two flaws concern the fact that every conscious decision is, and always has been, made toward an objective or goal. This is linear in a holistic world. And over more than a million years, most of human existence, we have only had two primary "tools" through which to manage or manipulate our environment at large. I've mentioned them earlier, but it's worth revisiting them again. Those tools? Technology, in ever increasing sophistication, and fire.

Some time around 15,000 years ago, after domestication of plants and animals, we developed the idea of another tool—resting the environment to allow for its recovery. So for all time, right up to today, in our attempts to address climate change we only consider these particular tools through which we apply our creativity, money or labour. In lesser situations, we have long used small living organisms as tools—insects to protect crops, micro-organisms to make cheese, diseases to kill animals or humans, and more. And of course we always make the decision to use any tool, or take any action, through one of more of many factors—research results, past experience, cost, cash-flow, profitability, intuition, fear, compromise, expediency, expert advice, and so on, endlessly.

From personal life, to family life, through to community and governance, if we peel the onion on even the most sophisticated decision making measures, we consistently find this core approach—whether Bushman family or a sophisticated scientific team at NASA engaged in space exploration.

The second flaw in our core framework is that there is no tool here that can prevent biodiversity loss desertification over about two thirds of Earth's land area. Again, only large herbivores and their symbiotic relationship with micro-organisms in their gut, used as tools, can prevent or reverse desertification, including its role in climate change. Of the human tools of centuries, two lead to biodiversity loss and land degradation in seasonal rainfall environments, and especially of low rainfall (these are fire and resting the environment), while resting the environment does lead to

stability or recovery in perennially humid environments.

So we now know and understand why, from the earliest days of modern city-based civilization in the *Fertile Crescent* and the East, where most of today's great religions developed, no human could avoid environmental degradation

through agriculture. For any human, no matter how pious, to make either an ethical or genuinely self-interested decision was hardly possible, other than in a permanently humid environment. I include ethical decisions or actions because no action can be truly ethical if it is only directed toward another human, but damages the environment.

[A prominent South African and British Commonwealth statesman,] Jan Smuts, who I believe was one of the brightest minds of the past century, believed humans would ultimately evolve into ethical beings. I believe using the holistic framework in decision making now makes this possible. While developed to enable us to reverse desertification, only after finally getting the framework functioning in all manner of situations did this fact dawn on me. It was not through wisdom or design, but discovered by accident.

**K.F: The general denial you refer to is compounded by fear: Fear of losing jobs, fear of losing a competitive business advantage nationally and internationally, and ultimately the fear of how much the investment in stemming climate change will cost—in financial terms. It's astounding to think there are still climate sceptics generating fear campaigns based on narrow short-term goals. But you and your colleagues are proving that making a significant impact on climate change—reversing desertification, in particular—is not cost prohibitive, that it is very achievable in real terms. Constantly having to highlight the necessary steps we need to take in order to achieve this is one hurdle. But is a greater hurdle proving that implementing measures to reverse climate change won't cripple economies?**

A.S: I do believe that the Australian Paul Gilding [an independent writer, advisor and advocate for action on climate change and sustainability] who recently published "*The Great Disruption*" has outlined and explained far better than I could what is happening and is likely to happen.

Using the *Second World War* analogy, he has pointed out how, when faced with gradually developing grave danger, we always act in denial, despite those people warning. Only when things reach a point beyond any possible denial do we act collectively. At that point action is far more drastic and costly but, regardless of the cost, we don't look towards *what we might like to do*. Instead, we look towards *what we have to do*—to survive. Climate change appears no different, and our behaviour today mirrors pre *WWII* behaviour.

There are two essential requirements. We have to stop excessive pollutants, including CO<sub>2</sub> from fossil fuels, and develop alternative mass energy forms, including those that will cater for transport using technology. And we have to sequester the already excess 'legacy load' of carbon from the atmosphere into the Earth's soils and oceans, while maintaining the essential normal carbon cycle of life. Now that we do know how to reverse desertification at low cost, while increasing food production and incomes, we also know we can sequester the legacy load through agriculture, but mainly in the world's vast grasslands and savannas using increased livestock.

For many years I have been saying this is the greatest (and if lost, the last) battle humans will fight—the battle to learn to live in harmony with ourselves and our environment. Gilding explains better than I that we are, despite denying it, soon going to hit the wall. In a finite world, we cannot follow current flawed economic concepts of constantly growing GDP (where building jails scores as important as building schools and infrastructure), while producing more eroding soil than food and causing desertification and climate change. The problems arising, from both faulty economic thinking and environmental degradation, are now hitting all governments like one tsunami following another.

The wall, that Gilding predicts as inevitable, will be hit sometime soon—without reasonable doubt. No business or industry will be too big to fail, and no cost too high. I firmly believe that, inevitably, the later the decision to place the survival of civilization on a war-footing (as post-denial action will be) the higher the cost monetarily—and in human suffering.

So in answer to the kernel of your question, early action (and already we are beyond what would have truly constituted

early action) means less disruption, and the rapid developments of many new businesses that are sound socially, environmentally and truly economically. Fundamentally, in future we cannot discount as irrelevant environmental costs, or allow any business to pass on such costs to the public or future generations. Today's tragedy of the commons financing and economic systems, and most businesses, is they are clearly unsound, ignoring, or passing on environmental costs. Although change is always scary, when we look at things historically, many of the major instances of change, which led to great opportunity and vast new businesses of greater diversity, were initially frightening or risky at first glance.

One area of change that is constantly resisted—reversing desertification—actually offers immediate and vast opportunity; Income, food production, and reduction in costs dealing with the many symptoms of desertification, as well as our greatest source of legacy load carbon sequestration. Rather than fearing change, a more informed public, as well as governments, should be more fearful of *not* changing.

**K.F: Where do cities factor into all this? Cities continue to grow as populations increase and relocate from rural to urban areas. And mega cities like *Istanbul, Mumbai, Shanghai* and *Sao Paulo*—to name a few—continue to expand. Could this trend actually inadvertently help divide mass population from dedicated mass grasslands, where the large animal herds that you call for can graze?**

A.S: Years ago when people began seriously calling for the development of sustainable agriculture we produced a short video, in which I pointed out we could sustain agriculture tomorrow if we could abandon our cities. We should, I urged, be calling for sustainable civilization. Civilization is city-based and so we have to learn fast how to sustain cities. This will take several things that we can foresee, and many good people are already working on them, although not yet with the resources that the gravity of the situation requires.

We need to develop mass benign energy sources, including those suited to transport. We need cities that mimic nature in the cycling of waste, so there is virtually no waste. We need agriculture that is regenerating soils and rebuilding ocean life. And we need to better use available rainfall over all areas of the world's land, because we are close to fighting serious wars over water. In fact, most of today's floods and droughts are entirely due to agriculture. The relatively few meteorological droughts and floods are considerably worse than they should be, due to agriculture. These droughts and floods are being caused by agriculture causing climate change, rather than by climate change itself.

Generally speaking, cities will need to be balanced more in tune with the rural populations that surround them. Currently, this is hard for people to envision, due to the belief that most of the world is overpopulated and over-exploited, and mass rural emigration to cities is the result. Added to this, there is, of course, the lure of city amenities.

However, I believe today's faulty agriculture is largely to blame for rural to urban migration. For crop farming to be ecologically viable we need smaller, more diversified farms. But due to faulty economic concepts, which are mainly aligned to scale, farms have become ever larger, mono-culture establishments that are not ecologically viable. At the same time, ranching lands have tended to be divided into ever smaller units, due to economic policies, death taxes, etc. But to be ecologically viable, they need to be larger units. Fortunately, there is no need to confuse ownership and management. The simple solution is that large owned farms can be divided into smaller management units—and vice versa with ranches.

In addition, under faulty current agricultural/economic policies, the tropical forests are being over-exploited and destroyed while the vastly bigger grasslands and savannas are actually desertifying because of under-exploitation. I repeat the solution: We can only reverse desertification, and all its terrible symptoms, by greatly increasing livestock numbers and providing far greater employment and income as we have demonstrated through the work of my organisations. The beneficial economic, social, environmental and military consequences of what I am saying are truly mind-boggling.

One other thing, which is also very clear; factory farming of livestock needs to end—and end fast—because it is so damaging in all respects. For example, the millions of cattle being fed grains in pens need to be returned to the land where they are desperately needed to reverse the desertification in both the U.S. and Australia—to name just two

countries leading such socially, environmentally and economically unsound practices. Feeding grain to cattle, which has induced excess oil production post *WWII*, accompanied by skillfull marketing ploys, will hopefully end. In its place, we should see on rangelands far greater production of *carbon and water sequestering* cattle, producing a more healthy and nutritious beef.

**K.F: Do you subscribe to some of the more community-focused trends emerging in cities, for example *guerrilla gardening*, where people in cities anonymously plant vegetables and herbs in public areas for the general community to avail of—free of charge? Added to this, there has been an increase in consumer preference for farmer’s markets, as well as food packaging labels detailing the air miles the food has travelled. Are these trends heading in the right direction?**

A.S: These are small steps, but steps in the right direction. They mainly indicate growing public unease and concern. And it is only public concern that will awaken us to do what is needed to save city-based civilization and force the political will to act. Viewed, as we need to, on a global scale beyond simple “objectives” like growing or buying locally to reduce what is called the carbon footprint of food, these measures are unlikely to save civilization. They are *feel-good* moving of the deck chairs on the *Titanic*. Agriculture, including annual grassland burning and desertification, as I have pointed out many times, is contributing as much, if not more, to climate change than fossil fuels are. We have to attend to that issue globally, putting it on—what Paul Gilding called—a “war-like footing” where cost is not considered. Instead, it is simply seen for what it is: What we have to do for civilization to thrive.

**K.F: With current agricultural practices being such a concern, and with the increase in the size of cities, what are your views on *vertical farming*?**

A.S: I believe the problems associated with sustaining mega-cities are so great that no idea should be condemned or criticized—by me or anyone else—without a context. First, looking at it as the proponents do, without holistic context, vertical farming is an *objective*: Construct tall buildings designed to grow food that takes up little space, while cycling the water. And they will achieve that objective. More food will result and, as proposed, it is likely to be disease free.

Like all objectives we can almost always achieve them. But when dealing with environmental, social and economic complexity—as this is, we routinely experience unintended consequences later. Long-term, and realistically, such objectives, and the means to attain them, should be tested toward a *holisticgoal* for each city. These will be similar, because humans are. A ‘holisticgoal’ is the new concept that drives decision making, policies, projects using the holistic framework to help us deal with the full complexity as is vital.

The ‘holisticgoal’ would be a statement of how the citizens want their lives to be, based on what they value most deeply in life. That quality of life would be supported by all the forms of production which would ensure such lives, and that in turn would be tied to the life-supporting environment of the city.

With a ‘holisticgoal’ we would have a context to enable people to assess vertical farming. There are some considerations that appear immediately, such as it being a closed system for water and atmospheric gases but not for nutrients, unless human waste is used somehow to return nutrients. There would be some concerns, which would need assessment, about the food being disease-free, but low in quality, and thus leading to disease. More detail than I have now would be needed to fully test that such buildings and production will truly be socially, environmentally and economically sound, short and long-term, for the city.

This would then automatically involve looking at the state of the environment that sustains the particular city, and what would be needed in that greater area to produce more healthy food, while sequestering legacy carbon and water, also essential for that city to survive. Following this, there would be a stage where one looks into marginal reaction per dollar invested in the vertical farming buildings versus invested in the environment sustaining the city.

I have a gut feel that the return on investment, toward the city’s ‘holisticgoal,’ would be considerably higher in the surrounding environment farming areas.

No point going on, but I hope you get the idea. We are in today's troubles globally because every human decision is made toward an *objective* but the real world is holistic in nature. Only by making our decisions, actions, policies, and projects using a holistic framework have we any real chance of sustaining city-based civilization.

**K.F: We're constantly being bombarded with advertising and marketing campaigns for organic foods, which pitch a more healthy, environmentally-friendly and wholesome option for the everyday shopper. Do you think the whole idea of 'organic food' is a help or hindrance for the climate change campaign, or does it simply highlight that, as a society, we are currently living on ultra-processed foods?**

A.S: Once more, growing food organically is an *objective*, as is producing grass-fed organic beef, for example. Great ideas, but frankly, if we intend to save civilizations, we need to go deeper in our thinking and practices.

Remember all the food in the world was grown organically in the past. And 100% of the beef produced was organic and grass-fed. That is what we had pre-fossil fuels, and that is the agriculture under which some twenty civilizations failed in all regions of the world. The only thing that has changed since then is that we now have an even more environmentally destructive mainstream agriculture, and the problem has gone beyond regional to being globally threatening.

This is not an alarming or doomsday comment, I am only drawing attention to the fact that, throughout history, all humans have made decisions toward 'objectives' and there are inevitably unintended consequences. If we, as we must, begin to take current and past destructive agriculture seriously to avert global tragedy, we can solve these problems. Almost all the knowledge we need is available in the various branches of organic, sustainable, biodynamic and mainstream agriculture. It is our core decision-making framework that led to the demise of past civilizations and has led to our current situation. By simply using the holistic framework that addresses the two simple flaws in the core framework, we can—and will—begin developing the new agriculture that can truly sustain cities, sequester the world's legacy carbon, sequester amounts of rainfall that dwarf the world's great dams and produce the food we need to sustain cities.

So while supporting organic agriculture and grass-fed beef, I keep appealing to people to look deeper. We need some trusted form of recognition or certification of holistically sound food production—production that is genuinely regenerating soils, communities and environment, on which the entire fate of humanity depends. And to help us reach that point, governments should stop subsidizing environmentally unsound agriculture, as they do today. Governments will not stop supporting agriculture that is endangering humanity till a more educated and aware public demand sound policy.

Politicians support policies subsidizing "cheap food," as is the case in the U.S., to buy support from an ignorant public. However, in the U.S. case—and it is typical of other governments—it is probably the most expensive food ever produced in history with all the environmental/social costs eventually having to be paid by the public one way or another—flood damaged homes, failing rural towns, emigration to cities, social breakdown, obesity crisis and medical costs, and so on.