Keys to Curbing
Climate Change

Opposing climate change ? It is possible !

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Summary

This essay proposes an outlook on how to avoid the problems tied to climate change. Our approach starts with a basic truth: the Earth's atmosphere and soil are the fruit of the biosphere, resulting from eons of evolution. Solutions to the biosphere's imbalance must be addressed through the biosphere itself, which acts somewhat like a system that regulates the climate in a way that is conducive to its survival. The biosphere's key element is carbon, the proportions of which are regulated by photosynthesis, between atmospheric CO_2 and the living world's organic carbon. With this knowledge, we hold the key to transferring excess carbon from the atmosphere to the biosphere on continents.

This is possible by increasing active continental biomass through various techniques that harness plant and animal (especially human) biomass towards the formation of humus. All of this requires a profound change of vision on biomass and agriculture, but also on water and hygiene.

Climate change: the challenge

Desperate times call for desperate measures! The increase in atmospheric CO_2 is growingly perceived as an environmental time bomb that could lead to planetary disaster. At stake, the survival of civilisation or even simply humankind as a species. Simulations of all sorts present alarming conclusions.

The only remedies currently being proposed are the reduction of greenhouse gas (GHG) emissions and/or the development of carbon sinks where excess atmospheric carbon could be stored. Yet thanks to photosynthesis, the plant world is by far the most important carbon sink available, in order to sequestrate atmospheric carbon into biomass.

Feeding the insatiable Moloch

The current approach is somewhat incoherent, despite the fact it fails to encompass a necessary global perspective. « Everything is being done » (really?) to reduce GHG emissions, so it is said. Meanwhile, to feed our insatiable energy needs, gigantic means are put forth to seek out new fossil fuel deposits (e.g. shale oil and shale gas). Evidently, the economic decision-makers – and by extension political ones too – do not seem to prioritise a sustainable economy: they rather prioritise profits.

On the one hand, proponents of nuclear energy readily proclaim that « nuclear energy does not contribute to climate change ». On the other hand, there is a mad rush to do scientific research on green energy: preferred sectors of research and development include biogas and biofuels, wood pellets, biomass combustion to produce electricity, etc. Some assert that because green energy sources are renewable, their contribution to the greenhouse effect is nil. This belief is so embedded that it is becoming an unshakable truth, a real dogma. Such an approach leads to a dead-end, as shall be shown herein.

Anthropocentrism vs Biocentrism

For at least 25 years, I have publicly defended a very practical « down-to-earth » approach for the control of water-related problems, which would have positive effects on worldwide food production. So far, this discourse has been met with total incomprehension and even hostility[1]. I have finally discovered that the crux of these is not scientific, but philosophical[2].

The current dominant view is anthropocentric. Obviously, this philosophy currently inspires all research and governs all activities. It has taken me years to come to realize that my scientific approach is inspired by a different perspective that has come to be known as biocentric.

Unlike anthropocentrism, centered on man, his immediate comfort and his short-term interests, biocentrism is a long-term vision centered on the biosphere of which mankind is a part. From an anthropocentric perspective, man has fixedly focused on himself, thus mentally removing himself from the biosphere. Anthropocentrism implicitly holds that the biosphere is in the service of man. Many phenomena and problems observed have proven that the anthropocentric view is harmful to all life on this planet. Problems related to water, food production and climate change are the direct and immediate consequence of this vision. Conversely, one can show that humanity could get out of these problems in less than a half-century by espousing a shift towards a biocentric vision, the sooner the better. The more we delay, the more painful will be the transition...

Message of hope

From a scientific and technical perspective, the approach outlined herein aims to rehabilitate the biosphere, already heavily battered and much destroyed, without compromising the comfort of man. Seen from this angle, the increasing CO_2 content of the atmosphere presents itself as an opportunity, even a chance, to regenerate the biosphere. The key is not to reduce carbon emissions but rather to use these to stop global warming and cool down the planet. Without a shift in this direction, climate change and its consequences will bring their share of disasters that may come to be qualified as « natural », when in fact they would be the result of wrong decisions from the past. Yet, these possible outlooks do not constitute a fatality: they can be avoided if only we would change our vision.

Carbon: a key element of the biosphere

The starting point of our approach is that the Earth's atmosphere and soil are the work of the biosphere. These are largely interdependent. When the biosphere is left to itself (without human intervention), an equilibrium sets in between the carbon of atmospheric CO_2 and the organic carbon activity within the biosphere. The equilibrium has been broken, and without human intervention, the biosphere's natural self-regulating mechanisms may take many thousands of millennia before a balance is restored. Man can speed up these mechanisms by acting upon the soil's humus. The basis of all life on land is fertile land, within its topmost layer. Humus is the brown

[1] In their opposition to the ideas put forth on the EAUTARCIE web site (www.eautarcie.org), agricultural technicians, sanitation engineers and hygienics specialists work hand in hand with many environmentalists.

[2] At one of my first official presentations of these ideas to an audience of specialists (in Poitiers, France), I expected an avalanche of technical and scientific objections. Interestingly, the main questions put forth were: « As you are a member of Belgium's Governmental Commission on Water, what is the official position of the Government with respect to your proposals? » Evidently, no one wished to undertake a scientific discussion on the matter, meaning that opposition comes from outside the realm of science. See link: http://www.eautarcie.org/doc/article-assainissement-integre-nouvelle-approche-fr.pdf (in French only)).

gold of the earth, harbouring a rich wildlife that lives in symbiosis with the plant world. Without these, no animal or human life would be possible.

Farmland's humus[3] has largely been destroyed by intensive agriculture, while the humus of temperate rainforests has been destroyed by deforestation and forest fires[4]. So-called « energy crops » are pursuing the destruction of our soils. Without humus, earth, the basis of all life on the continents no longer « holds in place ». Soil is easily eroded and ultimately ends up in the sea. Such loss is permanent and irreplaceable, at least on a human time-scale. Forest fires, deforestation and the loss of farmland's humus, not to mention the destruction of wetlands, have released and still discharge huge amounts of carbon into the atmosphere. As a side effect of the lack of humus, water from precipitation no longer reaches groundwater reserves (or very little). It streams directly into rivers where flows become unpredictable, random: very low levels in dry periods and flooding in wet periods. The water cycle is severely disrupted. Add to this the problems of overgrazing and inappropriate traditional agricultural practices in developing countries. All of this contributes directly to climate change.

The environmental problems the world is currently experiencing (concerning energy, water and agriculture) are rooted in ignorance of the processes that regulate the major natural cycles. Without a comprehensive vision, the risks of making mistakes are heightened. Unfortunately the opinion of « general scientists » does not weigh much[5] against that of high-level scientists, never mind that they only specialise in a specific field. This often leads to incorrect decisions[6] that directly affect the biosphere.

Sustainable wastewater management : a key to curbing climate change

The link between wastewater management and climate change must involve agriculture and the production of green energy. There can be no sustainable food production without sustainable urban wastewater management. The first essential step starts with the suppression of conventional wastewater treatment, an « all-to-the-sewer » system that obeys to the same principles as consumer society's « all-to-the-trash » system. This concept requires profound changes to one's mindset on hygiene and bacteria: otherwise, the ideas put forth here are unapplicable.

Human and animal dejecta are not waste, and they are more than a simple resource: they are part of the living world, part of the essential life processes on Earth. Without them, the biosphere's operation will be severely disrupted.

Specialists in agriculture and sanitary engineering have not yet discovered the intimate relationship between urban wastewater and agriculture. However, the true culprits of this situation are to be found in the circles of medicine and most especially in the hygienist ideology. Hygienics[7] is based on an incomplete and inconsistent scientific approach. To put it simply, and even simplistically, hygienics is the ignorance of all the relationships that exist and can exist between microscopic organisms (bacteria, viruses, fungi) and the appearance of certain diseases[8]. The most direct effect of the dogmatic system established by the hygienist ideology is the fact that more than 3 billion people have no access to quality drinking water. Slogans like « Water is a common good », « The democratic management of water », « The right to drinking water for every human being »,

[3] See link http://www.koreus.com/video/alerte-babylone.html (in French only).
[4] See link http://www.eautarcie.org/en/01c.html#m .
[5] See link http://www.eautarcie.org/en/01c.html#a .
[6] See link http://www.eautarcie.org/en/02b.html .
[7] See link http://www.eautarcie.org/en/05b.html#c .
[8] See link http://www.eautarcie.org/en/03e.html .

« Worldwide water solidarity », etc. are only expressions of wishful thinking, without any tangible effect. If we don't adopt a biocentric vision, these problems will worsen.

But the major drawback of hygienics is that it considers human faecal matter as the « absolute evil ». This is why, in matters of sanitation (the word is revealing[9]), its first priority is to preserve human health, whereas protecting the environment comes last of all[10], conditional on its « institutional appropriateness ».

The pollution load of black water (effluent from toilets and urinals) is not a hazardous waste, insomuch as such wastewater is managed to form humus. It is a precious resource, the value of which can no longer be ignored. Wastewater becomes « waste » only when grey water (soapy water) and black water are combined (i.e. the « all-to-the-sewer » system). This mixture in turn becomes « hazardous » only upon treatment. Without delving into the scientific details, wastewater treatment destroys dejecta's molecular structures that are essential to form humus for soils[11], thereby transforming the mixture into pollution. It deprives the soil of organic structures that are vital to maintaining humus in the soil. The amount of nutrients (nitrogen-phosphorus-potassium or N-P-K) is far less important [12] than the place these hold within the molecular structures of excreta[13]. In this sense, the treatment of urban wastewater is a major environmental nuisance that is currently not recognised despite the already visible consequences.

Climate change control mechanisms

The dejecta of over 7 billion people (9 to 10 billion foreseen by the end of the century) constitute a biomass that is comparable to that produced by livestock. Both human and animal dejecta, treated with a very large amount of plant-based material (rich in carbon-based cellulose) would eliminate the need for chemical fertilizers in food crops worldwide. By eliminating the « all-to-the-sewer » system, a new infrastructure would arise, especially around large cities. Hubs that we have coined Integrated Biomass Management Centres[14] would produce essential organic agricultural amendment from human and animal waste, by means of composting, to help regenerate land ecosystems within the biosphere.

This path is inevitable if we are to regenerate the humus content of farmland and other soils. By thereby eliminating the use of chemical fertilizers, the need for phytosanitary products such as pesticides and herbicides would also regress. It is not exaggerated to assert that in such a case, global agriculture would become organic by necessity, without the need for any binding regulation. It will not be necessary to prohibit the use of pesticides since agriculture, having become organic, will no longer need these.

One gram of stabilised humus is able to hold up to 50 grams of water, like a sponge. With humus regeneration will come a decrease in irrigation needs. Water from precipitation will no longer run off into rivers but will be absorbed by the soil and plants, and ultimately return to groundwaters that

[9] The word «sanitation» (from sanitize) is a tragic mistake that has had grave consequences. It would be better to speak of «recycling of wastewaten», or better, «wastewater management».
[10] See link http://www.eautarcie.org/en/02a.html#b .
[11] See link http://www.eautarcie.org/doc/article-qualite-compost-tlb-en.pdf .
[12] See link http://www.eautarcie.org/en/02c.html#a .
[13] Reusing some of our urban sewage sludge for agricultural fertilisation is only a caricature of the process of making humus as by composting plant-based materials impregnated with black water and liquid manure. Propounding the recycling of these elements for agriculture by reusing sewage sludge and liquid manure is a dangerous lure. The same can be said of the alleged «agricultural value» of biomethane digestate.
[14] Such a Biomass Management Centre already exists in France since 2011 (link : http://www.trecofim.com/). It produces «hi-tech» manure that is praised by farmers.

are currently being depleted. River flows will become more regular, the frequency and severity of flooding will also decrease. The effects of drought will ease.

The huge amount of nitrogen-based biomass that could be selectively collected [15], including black water from cities as well as animal manure from farmland will require retrieving all carbon-based plant-sourced biomass available (which presently is most-often burned[16] for purposes of energy recovery or simply because it is more convenient (!)), for utilisation in the aforementioned Integrated Biomass Management Centres, as key components of the inherent composting process required for the transformation of human and animal waste into humus. Cities will sort of become the «umbilical cord» of worldwide food production, considering that the world's population is growingly concentrated in cities. Since our food is a product of the earth, it becomes obvious that our excreta should go back to the earth, but not anyhow. This must be done in such a way that the great natural cycles of carbon, nitrogen, phosphorus and water[17] be renewed. What we have coined as a New sanitary engineering[18] will help restore man's place within the biosphere. After which, future generations will view today's sanitation techniques and the treatment of urban wastewater as a passing mistake, an unfortunate sidetrack...

Carbon footprint of New Sanitary Engineering

Willfully restoring the humus content of farmland is a process that can easily take half a century while requiring the harnessing of all animal- and plant-based biomass available. In so doing, we will observe local climatic improvements in dry or arid regions, as a side effect of the restoration of those ecosystems' soil moisture regimes. It is said that the climate makes the soil, but the converse is also true: soil conditions determine the climate. In dry regions, updrafts will become less frequent and less intense due to the power of soil's increased water-holding capacity and the concomitant extension of plant growth and evapotranspiration. This will improve local rainfall patterns. For example, by implementing a comprehensive worldwide program for sustainable management of biomass, the Mediterranean and Middle-East regions would likely become a vast flourishing region of greenery.

Starting today (2014), harnessing worldwide available biomass over a period of decades would sequestrate carbon into soil and plant life in a measure equivalent to the amount of CO_2 that has been released into the atmosphere by fossil fuel combustion. In its early years, this carbon sink would absorb more CO_2 from the atmosphere than what man can release into it. After several years, one would observe a slowdown in the increase of CO_2, which would likely peak off somewhere between the years 2050 and 2080. The peak of CO_2 would simply correspond to the point of equilibrium between carbon absorption and emission within the biosphere

Carbon absorption would obviously be greater than what it was during our preindustrial era. To achieve this, it will however be necessary to reforest vast regions that are currently dry, semi-arid or arid. Fortunately this is an autocatalytic process. It speeds up as it progresses, until it reaches a point of equilibrium.

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[15] To get an overview of this *new sanitary engineering*, watch our 14-minute video on Youtube: https://www.youtube.com/watch?v=u9er47QA_yM .

[16] The removal of forest undergrowth (see http://www.eautarcie.org/en/01c.html#jeanpain) will provide the lion's share of plant-based biomass needed at the impregnation and composting centres (otherwise called *Integrated Biomass Management Centres*). Thanks to this, forest fires will be diminished, thereby reducing the destruction of millions of hectares of wood and the generation of huge amounts of CO_2 in the atmosphere.

[17] See link http://www.eautarcie.org/en/02d.html#b .

[18] See link http://www.eautarcie.org/en/02b.html#f .

Fossil fuels: an opportunity in face of a growing world population

Short of promoting the current energy squandering, consider that the huge amount of carbon released into the atmosphere constitutes an unexpected carbon reserve that can be used to increase active biomass within the biosphere.

One must not underestimate the measurable gaseous exchanges within the atmosphere. Despite the biosphere's poor health, it exchanges several times more CO_2 with the atmosphere than what man releases into the atmosphere annually. One could say that the biosphere « breathes ». This « breathing » would become more intense with the biosphere's rehabilitation. An ecosystem on the rise absorbs more carbon than it emits. Equilibrium is reached when ecosystems stop growing. In the coming 150 years, we can expect society to closely monitor the evolution of the atmosphere's CO_2 content and the biosphere's carbon sequestration capacity. In the next century, man will be able to identify the biosphere's optimal carbon content required to attain a dynamic equilibrium. Given that our atmospheric carbon reserves (from fossil fuel combustion) are measurable, we can calculate what area of deserts need to be rehabilitated in order to stabilise the world's climates.

Scientists of the future can then accurately calculate the equilibrium point that is not to be exceeded, so as not to trigger global cooling. Sequestrating the carbon that has been released by man, setting it into active biomass, will create vast new areas of greenery for the living world and for mankind (as deserts will regress). By curbing climate change, we will be able to feed those 10 billion people forecasted by the end of the century. However, a challenge still remains: curbing climate change must go hand in hand with curbing population growth.

« Excess CO_2 »: a part of the biosphere

By burning coal, oil and natural gas, man has done nothing more than release the carbon that was an integral part of the biosphere about 200 million years ago, during the Carboniferous period. From a series of geological accidents, this biomass accumulated underground and underwent various transformations.

Modern man has taken up part of the underground reserves of carbon for his energy needs, but instead of helping the biosphere to find a new balance, he has continued to destroy it. In so doing, he has simply reinforced the imbalance created by biomass combustion. Chances are that the degradation of the biosphere – started since Antiquity – has significantly contributed to the increase in atmospheric CO_2. What we are proposing is simply to reverse the current trend by taking advantage of this CO_2 increase to fortify the biosphere and especially create (in fact restore) new havens in the biosphere to harbour life of all sorts, such as endangered animal species or an expanding world population.

Climatology research needs a change of path

We think it is a mistake to strictly blame fossil fuel consumption for the current imbalance. It would be worthy to initiate research to evaluate the optimum ratio between the atmosphere's carbon content and the amount of active organic carbon elsewhere in the biosphere.

« Green » energy needs a change of perception

Contrary to popular belief, the combustion of biomass for energy purposes is not a neutral operation, climatically speaking. In a biosphere that is in equilibrium with the atmosphere, a certain

amount of plant and animal biomass can be harvested for energy purposes. The condition is to not reduce the amount of active biomass. Current energy squandering requires gigantic biomass consumption, which helps strengthen the greenhouse effect caused by the power-hungry use of fossil fuels.

Considering the current state of degradation of the biosphere and the dilapidated state of farmlands, each kilogram of animal-based (including human) biomass and plant-based biomass that are burned to supply energy is a factor of imbalance. The biological value of biomass (as potential humus) that is destroyed in this way is far superior to that of the very little « green energy » produced. We must remember that even by harnessing all agricultural land for the production of green energy, this activity will only cover a very small proportion of our current energy needs! From an energy perspective, burning biomass and its derivatives (biomethane, biofuels, wood by-products) is highly inefficient, presenting a very poor input/output ratio.

In this sense, the production of biofuels and biogas (like biomethane[19]) and the burning of agricultural waste and wood by-products to produce electrical energy are self-destructive activities. All the more so when this destroys key elements that could be used for the formation of humus (e.g. wood pellets, an ideal resource for Integrated Biomass Management Centres).

Green Energy of the Future?

For the production of green energy, the solution of the future will be microbiological in nature[20]. One of the really credible pathways is the recovery of heat from composting to heat greenhouses and homes. Indeed, when composting straw and other cellulosic waste that have been impregnated with black water, the temperature can reach 70°C, and if well managed, can be maintained above 50°C for several months. Ongoing private experiments in Hungary, Germany and Russia seem promising, on the possibility of using this thermal energy to provide a base heating for homes.

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Mons, May 3rd 2014.

[19] See link http://www.eautarcie.org/doc/article-methode-jean-pain-fr.pdf (in French only).
[20] …but not stupidly, as when hydrazine is produced microbiologically from urine (a necessary component of potential humus)…