

NB: This text is meant to start a discussion, so take a pencil, write on it and come back to the website to comment!

Voir le monde en couleurs

Introduction

Climate Change (the one against which we've been having « last chance summits » for years) is no big deal. Actually a good part of the world's population is not aware of it, and a larger share does not really care and might not be badly affected. Not to mention the fact that some regions of the world will be better off with a few degrees more. As for the natural world, some species might disappear, some landscapes be ravaged, but others will adapt and diversify again. The planet has gone through other climate changes and mass extinctions before, yet we are here to tell. And with 7 billion specimens and advanced adaptive capacities, the human species definitely is not at the verge of extinction.

So why bother? And first, what is the matter? Why is everyone in a rush?

Imagine you just woke up from a 200 years sleep. When you fell asleep, people were living their lives in their villages, barely aware of other neighbouring cities, let alone other countries. Occasionally there were wars or famines, and those who could would move under better skies, the others adapt, in the worst case die. The luckier ones would live about 50 years, working hard under the sun or the rain everyday. Some people still live like this, actually. Today you wake up, people live 70 years or more, work about 40h a week, most have a good roof over their heads and pretty much everyone has enough to eat (more on this later on), **while there are less and less war victims** (this sounds cynic, but we get the impression of a lot of deadly wars because of the magnifying lens of media). There are some big storms, industrial accidents, draughts, floods, terror attacks but you say: we have been through this before, let the victims adapt.

Yet there is no week when the news are not alerting you about an end of the world: an imminent financial crash, a new war, the cooking of the planet, the election of an extremist head of state. In the meantime, everyone seems to be rushing somewhere, either attending political summits to discuss these « global challenges » or, in the contrary, travelling to remote countries for holidays as if it was the key for happiness. Others bet trading with far away countries to make as much money as possible.

And again you ask: What is the matter? Why is everyone rushing?

Yet if you speak with these people rushing, they do not seem concerned. By personal conviction or lack of time to get informed, they do not see any issue. And in one way or another, we are all doing the same. If we were accepting the reality and imminence of all the threats we are told about, our actions would be very different (what would you be doing differently?). By putting them further away in the future, minimising the problems, and believing in our incapacity, as individuals, to change anything, we are managing to proceed with a normal life. And that is nothing more than natural.

Yet maybe we should be doing something, even if only a little part of all announced catastrophes was true. This bliki is my personal something. Trying to make sense of all the challenges we are told to face, tell what is the matter, why everyone is rushing.

So am I just adding my cry to the alerts of the media I have joked about? In one sense yes, I am endorsing the idea that we must change, and fast. Yet these thoughts have been brewing in my mind for the last decade or so, they feature in my studies and my work and I have discussed them with people literally all around the world (without plane). They now need to travel out there on their own. There is something to worry about and something you can do. Beware you will be convinced of that by the end of this read.

Some people asked me if I was writing to share these ideas, and this bliki is also an answer to that. More importantly, it is a way of continuing these discussions, with you, to make the content more and more convincing. To try and show everyone something important enough for them to bother. For this of course it is very important that you react to what you will read here. And we will try to fit your ideas in. I believe they will.

Indeed, at the root this bliki is based on something I assume to be shared by everyone (at least all those I reached so far): we want to preserve and enhance life around us so we can live happy, as well our families, our friends, and (for most people) all those who could become our friends. If you disagree with this please post a comment. The second deep root of my argumentation is a reality harder to deny than Climate Change: the society we live in now is changing – it constantly is, whatever we do, not speaking about tipping points – I believe we are at one. So better adapt and try to push the change in the direction we want – that which might preserve life and keep us and those around us happy. The earlier we start pushing, the better the effect, thus the rush.

Hopefully, this bliki will give you the will and the ideas to discuss further yourself. That is the only thing I will be advising you to do (turn off the lights at home if you wish, but that will not do any big difference). In my opinion it is the only thing we need to force ourselves to do: it is enough to think about these changes, take the time to investigate about them by ourselves and to share and discuss with as many people around us as we can. Easy and often fun (when not depressing). All other actions just seem natural and easy after that (lights will just be off whenever you do not need them).

It is not about environment protection, not about political orientation, not about technological solutions. It is the ages long war of ideas, and we are all soldiers. From now on, want it or not, you are enrolled, on alert. One way or another, these lines have influenced your thoughts, formed new ideas. And with that already you participated in the war effort. So, please, do use those weapons now and fight on whatever side you want: tell the next person you see about these ideas. Look out for more information to consolidate them (news, social networks, the life on your street). And whenever you need more ammunition you can come back here, the bliki will be growing.

How it works? This bliki has this “wiki” part which should be concise, to the point, summarising where I stand: Show you what is changing and why bother (how it might disturb your happiness and that of yours). And where we can shift this change to in order to secure our future. Affirmations are sometimes documented, but otherwise you can easily confirm them through online searches. Then in the “blog” part I will add further examples and details from the news and my experiences, as regular posts. So keep in touch!

A last word before we start: by now you might have thought that the best tactic in this war is to write a bliki about your ideas and share it with all your friends. At least that was my conclusion. But maybe you do not have time, or the inspiration, or the means. Well, feel free to contribute to this one by commenting (unlike in a blog, I will modify the content of the wiki part as I get feedback) and to share it (note: no profit is being nor will be made from this website, no matter how many readers it gets: **no advertising, no sales, no copy-rights...**).

Thank you for your attention so far!

I. We're changing because we're not sustainable

Sorry for the cliché, but that is true, the “world is changing”. Beyond natural, perpetual changes, we've reached a point where we change because there is no other choice. Because the current state is not stable, not “sustainable”. What is sustainability? It is the ability to “**meet the needs of the present without compromising the ability of future generations to meet their own needs**”. Why are we not sustainable?

Picture yourself on a long, long car journey with your family (3 kids) on windy mountain roads with no one in sight since you started driving. The car is our planet, the family our society. Turns out we're low on fuel, we're overheating the engine, and the kids are becoming unruly...

In such a situation, either you slow down, switch to another kind of engine and open the windows so everyone gets some fresh air and calms down, or you're at a serious risk of an accident — ultimately you'll run out of fuel if nothing worse has happened in the meantime. Humanity is more diverse and resilient than a single family, so it will likely not collapse at once, but it is certainly changing. In the next three sections I'll describe part of those changes and give an idea of how fast they are likely to impact us.

It's hard to say this change will be “good” or “bad”. Humanity has been there for a few hundreds of thousands of years, and the long term consequences of the steps we'll take in the next century are way too unpredictable to be judged. Fact is, change is happening, it impacts you and it will impact your children and/or the children of your friends. Up to you to decide if you want to take part in the process, and where to push.

a. We're running out of fuel (are we?) – the physical limits

That is the first challenge: we chose to use a gas engine (because it allows us to drive faster), but there is no gas station on the way. Fossil fuels, they're called, Oil, Gas and Coal. They've been created underground by very high pressure and temperature over hundreds of millions of years based on the huge amount of biomass generated during a whole era of intense vegetal growth, the Carboniferous. As such, there is a limited amount of them.

How much? You might have read we have enough oil for 60 years... **Well, that has been the case since the last 30 years at least!** And we don't seem to be decreasing their consumption by any amount, on the contrary. Nope, what happens is this: every time we start depleting what's called the “proven reserves”, the prices go up (remember 2008's 100\$/barrel?) and that triggers intense research for more resources, in new places or using new technologies (conventional technologies allow to extract barely 80% of a good reservoir), so the “proven reserves” expand. The problem with this is that we rely on those price peaks to keep fuelling our economy, with impacts on our society. From the moment a finite resource becomes really needed and the first, easy reserves are extracted, the price goes unstable. That is a threat for the supply security. Moreover, the rush to extract as much as possible at the lowest possible price often results in precarious working conditions and local social instability.

The same happens with a lot of other resources (more price peaks [here](#)). Rare earths, you might have heard about, are used in all our electronic devices and for now extracted almost exclusively in China (except for [a mine in California which has gone through severe ups and downs](#)), which is a worry for many countries. Lithium, used in batteries, is relatively abundant on earth, but **there is little extraction capacity for now to ensure shifting our energy system to full-electric**, which would require lots of batteries. You might have heard of cobalt, also used in batteries and electronic devices, **which has been at the core of violent wars and child labor in Congo** – because that's where it is cheaper to extract at the moment.

Back to oil, how much is there left? Nobody knows. You can find estimates more or less official and scientific estimates [here](#). To give an order of magnitude, assume there are twice more real reserves than the proven reserves. That's enough oil for 180 years at current rate of production. There is also way more gas and coal than that. As for metals, [there are mineral nodules on our ocean floor meant to be a huge unexplored reserve](#). We are not going through more detailed numbers because they are useless. Lack of resources is not what will stop our car in the next couple of centuries (it will though, ultimately, if nothing else does)...

It is like carrying a large tank trailer of gas with the car, but being connected to it by a defective pipe. The pipe keeps interrupting the supply of the car, resulting in bumps that are damaging the engine and making your family sick.

b. The engine is overheating – the environmental limits

Of course, driving that fast is causing the engine to overheat. Not only that actually, but also with all the curves you can feel the steering wheel is not responding normally, and one of the tires might be about to burst. Same with the environment: we are asking more from it than what it can provide.

The most known of these effects is greenhouse gas emissions. We are emitting more greenhouse gas than what the environment is able to absorb (we are heating our engine faster than what the cooling system can cool it). As a result, that gas (carbon, but also methane and others) is accumulating in the atmosphere and causing the heat from the sun to be trapped on earth (similar to a greenhouse heating up under the sun, thus the name). Note that the environment itself has always emitted and absorbed carbon – through breathing and photosynthesis namely. That's why it is called the carbon cycle. Actually, compared to the volumes circulating in that cycle, our emissions might seem quite small – and some of it is resorbed by the oceans. However, because it is carbon added to the cycle, it is building up, and so are concerns about its consequences (climate change, if it needs to be named, but also the acidification of the oceans).

However, that is only one cycle we are saturating. There are a few others, which have been named the “[planetary boundaries](#)” – and we are off a few of them already. You might be surprised to know it's not the carbon cycle saturating the most yet... It is nitrogen, phosphorus cycles (although these are more difficult to quantify), as well as biodiversity (which you can think of as a « gene cycle »).

Phosphorus? Nitrogen? Under certain chemical forms, that is what chemical fertilisers contain. The industrial production and use of fertilisers is adding phosphorus and nitrogen to the soil at a faster pace than what it can process. As a result, those substances accumulate in the soil and the water, with damaging impacts on eco-systems ([among the most visible of them: lakes turning green with algae that kill pretty much everything else in the water](#)). It is quite telling to look at a field or a garden that is being “well kept” (meaning sprayed regularly with chemicals): whatever is being planted and cared for will be large, colourful and lively. But if you look at the earth at the bottom, you will usually find it bare and dry. A very different picture than if you go for a walk on a healthy prairie and look at the variety of plants that densely cover the ground.

As for gene circulation, there is a loss of biodiversity due to the intensive use of pesticides. You might have heard of the neonicotinoids threatening bees – all kinds of other bugs and animals are being killed by those. The destruction of ecosystems, namely rainforests, is another major cause of this depletion.

Another cycle that we are impacting, although it is not yet a major issue at global scale, is that of freshwater. By capturing it for our agriculture and daily uses before releasing it, soiled (with pesticides, but also your soap, paints, oils etc) in the environment, we are exceeding nature's capacity to clean it back. As a result, other users of the water, downstream from the rivers, are seeing their reserves shrink, which can result in conflicts locally. And with changing rain patterns, due to climate change, that is only going to exacerbate, which is an example of how interconnected the planetary boundaries are. Similarly, air pollutants released

namely when burning fossil fuels and when spraying chemicals accumulate in the air faster than they can be filtered by natural processes, with damaging impacts on human health.

Note that a common point of these human impacts is how they are related to food and energy. Which of course are strongly linked: **producing chemicals requires a large amount of energy**. Adding the energy, thus fossil fuels, required for the transportation and transformation of industrial food, and the emissions linked to cattle, the food industry turns out to amount to over a quarter of human-made emissions, besides **being the main factor for the depletion of our soils**. Indeed food and energy make most of our days, directly, to eat, move and heat and indirectly through waste and consumption.

So, how much have we left before we completely saturate a cycle? Hard to say, again. There is a measure, **the ecological footprint**, which quantifies the surface of natural land that would be needed to regenerate the resources we use. In 2007, we would have needed 1.5 planets to sustain our activity (with “developed” countries needing way more). But knowing for how many years the planet can absorb that extra 0.5 is complicated. What is for sure is that we are already seeing severe impacts on the environment. **If you believe the IPCC** (International Panel for Climate Change, which has been created to provide governments with insights on the particular issue of climate change), it is a matter of decades before we see catastrophic damages due to climate change, and we have a few years to react.

These predictions are made difficult because of positive and negative « feedback loops ». For instance, 2019 has been a year of unprecedented fires not only in the Amazon but also in the **arctic forest**. Such fires are not followed by normal forest regrowth (in the Amazon because the nutrients contained in the ashes are easily washed by the rain, in the Arctic because the peat soils that have burned are formed through accumulation of biomass over long periods of time), so they trigger the emissions of large amounts of CO₂ that will worsen climate change and in turn trigger more fires. Wildfires in these regions are not new, but **the surfaces burned have sharply increased lately and it seems to be the first time that peat soils are burning so intensely**. This and other feedback loops could mean **we reach an uninhabitable planet faster than expected**. We will come back to this uncertainty in the next section.

But even before that, we might face the third and most threatening limit. With the engine overheating, the air-conditioning broken and very uncomfortable smells penetrating the cabin from the tank and the engine, not to speak about the worrying noise coming from the wheel spindles, the kids, your partner and yourself are getting very upset.

c. The family is breaking down – the social limits

You never know with kids... One of them might try to open a door, or kick you from the back, and you're losing the concentration to drive properly. As for your partner, you've never seen that face expression, looking as if wanting to just push you off your seat and take the wheel. Society is taking a similar path, with political tensions building up and international conflicts threatening to escalate.

This is visible through several aspects. In link with climate change, there is climate injustice: regions of the world that are more arid and poorer are experiencing more severe impacts from changes in rain patterns and low-resource regions are less prepared to face extreme weather events, which are becoming more frequent. As a result, populations in these regions are trying to move under better skies or defy their governments with dramatic consequences in some regions of the world (the war in Syria is **the most spoken of these indirect impacts of climate change**, but others are following).

Even in countries spared by climate change so far, there is growing unrest (think about the polarisation of the

political life in Europe and the US). With all kinds of reasons (ask yourself, why are you unhappy with your government?). One of them better documented: raising inequalities.

Figures change, but in 2017 it was: **the 8 richer people in the world (out of about 8 billion) had as much as the poorer 50%**! And why are inequalities growing?

Explanations are multiple, but try this one: picture wealth flowing in society. Until a couple of decades, most of the wealth was flowing between individuals, with wealthy bosses paying their employees, house-maids and drivers who would in turn spend that money on first necessity products sold by farmers or retailers, who would then buy more complex products, which required factories to be produced, which were run by those bosses. In parallel, everyone would pay taxes to the state, which could contribute to wealth redistribution by providing cheap public services (from providing water to transportation or energy). Nowadays, money essentially flows between companies, whose goal is to maximise profits, thus minimise wages. There is a specialised company for nearly any function you need: cleaning, programming, baby-sitting, hosting... Reciprocally, people buy their goods now almost exclusively from large companies (supermarkets, multinational brands). The top-down faucet is closing as tightly as possible while the bottom-up one opens wider and wider. Ultimately these companies are owned by a few, who collect the gains. And because the few of the few with the most money are the ones with the means to buy other companies, they can become even wealthier. As for taxes, they're lower for companies in the first place, and it is way more difficult for states to run after something that grows with no substance from a signature on a paper than after an individual with a birthplace. And why are economic inequalities a problem? It has been proven that levels of inequality are linked to several conditions to a good quality of life, **not only for the ones at the bottom of the social ladder, but also those at the top**. However, on top of that, wealth inequalities are increasingly linked to quality of life inequalities. With more people working in companies with a salary as only income, we're increasingly unable to cater independently for our own needs and desires. And with more and more product differentiation and creation, we increasingly need to pay for anything we need. Food is free to plant and to harvest, but we have no time nor land to do so. Walking (and biking) is free, but again we have no time for such, and cities are more often than not designed for fuel-consuming cars. Nice landscapes are free to enjoy, but increasingly we're being lead to the nearest viewpoint, at a fee. Meeting with friends and having a nice conversation is free, but time is scarce and we're now meant to rely on data plans, online platforms and expensive phones to keep in touch.

Which brings us to the last point, maybe the most critical one. When communication, information, transportation, food, are in the hands of a few, those also have way too much power over our lives. What's worse, they're handing it further to algorithms. I don't believe Mr. Zuckerberg (do you know this means "sugar mountain" in German?) meant to **manipulate the US elections** or Mr. Bezos meant to **waste his workers to exhaustion**. But those are the paths generating the most profit, as calculated by algorithms (and business analysts), so those are the paths chosen. As long as the workers (and the consumers) have a penny and a second left unallocated in their lives, there is a margin for optimisation – from the purely economic point of view. As a side effect for this, wherever a job place can be automated, subcontracted or deleted, it is, leading to growing levels of unemployment that deepen the social divide.

And if someone pushes for a change, how easy is it give her/him the impression s/he is heard when only her/his likeminded friends are reading her/his posts? How easy is it now to shut her/him off, to track her/his steps and thoughts and muffle them before they even come to clear conscience, through advertising or well targeted distractions?

But for how long can society stand this situation? When will someone in the car go completely nuts? In any case, these are changes that are happening right now, and will only accentuate in the coming years.

Conclusion

This section gives the basics to the “sustainability triangle” (in a slightly changed format). Humanity is on a completely unsustainable course: basing it's development on finite resources is depleting them at the scale of the century while creating economic instability; releasing the products of this extraction in the environment is breaking natural cycles and leading to mass extinctions at the scale of the decade; doing this process at the expense of the majority for the profit of a minority is creating social unrest we're already seeing around us.

You could argue this is all relevant, but by definition this unsustainable way of functioning will change, thus there is no worry to have about it. Whatever the situation in a couple of centuries, it will be a sustainable one. True. But is a sustainable situation really a nice situation? The next section shows the 3 sustainable long-run scenarios, for you to evaluate which one you prefer. If there is a preference, the section after gives more reasons to act, and clues on what to do.

Thanks for the reading so far, anyway.

II. What are we changing towards?

The previous section shows how the world is changing. How those change factors interact is extremely complex. We are seeing financial and oil crisis, hurricanes increasing in frequency and intensity, political extremes earning votes, with international tensions building up to the point of locally degenerating in wars. It is impossible to say where all this is leading us. But looking ahead it is possible to imagine which are the sustainable scenarios on the long run.

In short, the car might break and send us down the cliff; the driver could turn on the movie player to entertain the kids while turning on the self-repair function of the car (hoping it works) or the whole family could decide to slow down so all can listen to the noises the car is doing and help fixing it.

There is no right or wrong with these scenarios. It is up to you pick which one you prefer and decide to fight for it or not. I will only take position in the next section, and in posts linked to each subsection.

a. Environmentally sustainable – the extinction scenario

That is objectively how to minimise human impact on the environment. Extinction, and more generally catastrophe scenarios are filling our imaginaries through movies and alarming political reports. The kids are crying with fear of a car crash. It is an environmentally sustainable path since life is extremely resilient, if not at our level at least at the bacterial level. Even in the event of a nuclear war, there would be no strategic reason for armies to cover the entire globe with sanitising fire. Somewhere in the depths of the oceans or the heart of the deserts there will be life struggling to keep on and radioactivity only lasts for a couple of hundreds of thousands of years.

This is not a very stimulating scenario to think about though, because if we ever get close to it there will be a very natural push to resist it, and it is likely some would survive (either in bunkers or in very remote territories) and re-develop into one of the other scenarios. Whoever is not part of those lucky few has little to worry about, just as it is always too early to plan for your own death.

b. Technically sustainable – the artificialization scenario

There seems to always be a technical solution out of the challenges we are facing, more or less mature. We can replace fossil fuels with renewable energy (or use nuclear fusion – although that is a far from mature solution), replace raw materials with recycled ones, grow hydroponic crops, cultivate meat in vitro for food, capture and store excess carbon from the atmosphere and install mass surveillance algorithms to manage social unrest. It is then a matter of calculations and optimisation to dimension these solutions properly as to optimise survival rates (or happiness rates).

Deploying such solutions in a coordinated way requires setting up complex standards and regulations, market based or not, and ideally have them adjusted by algorithms (artificial intelligence?) as we go. Choosing one of the solutions usually raises new challenges (e.g. carbon capture requires a lot of energy, which to be provided by crops or solar power requires to increase land use), so to reach sustainability the used models should reach a complexity comparable to that of the entire human and natural system, if such a thing is possible. Large companies and/or powerful states are the stakeholders which have the means to implement such a comprehensive modelling. However, the chosen solutions would be way too complex to be explained to every individual, so the majority would be provided with just the necessary elements to remain happy and quiet. Because these solutions are complex and expensive to set up, they would be applied first in regions

with more resources and know-how, leaving part of the population to survive with traditional means until they disappear or are assimilated in the modern system.

Nevertheless, this is ultimately a sustainable scenario, and again one that is very present in our imaginaries. Be it in integrated cities as in Black Mirror's Fifteen Million Merits episode or aboard a spaceship like in Wall-e, we know what it could look like. It could probably happen relatively well even.

c. Socially sustainable – the sobriety scenario

Another scenario is one where we reduce our use of the resources and distribute them better (to everyone and to every use) so all have enough of what is needed. It comes down to a few fundamental needs. The intuition is that we are today over 7 billion humans surviving on earth, a share of them with very comfortable living conditions and with a lot of surplus. Sharing that surplus should allow to reach decent living conditions for all.

In parallel, we would need to cater for these needs while preserving the environment, and there are plenty of ways to do so. Some of them using technology (like renewable energy), others understanding better how ecosystems work (as with organic agriculture) and others relying on cooperation between and within communities (like building housing from natural materials and maintaining them accros generations). The only limit is our imagination, and what human creativity can provide. However, to do so we can not rely on the current socio-economic mechanisms, which rely on increasing consumption to structurally increase inequalities, as exposed in I.c. Another logic would be needed, where goods are made to last so less can be produced (did you notice buildings are nowadays meant to last for a couple of decades only, while we still have some centenary houses around?) and where sharing what we have is the default before growing it further if really needed. Such a system can be designed and run at all levels of governance, from the individual to the international cooperation going through local authorities and states, provided that competences and opportunities are fairly distributed.

You might argue there is not enough for everyone – that is what markets were created for: allocation of scarce goods. But if we look at those fundamental needs, does it hold? Because this is a scenario less present in our everyday thoughts, let us detail a bit:

- Food: **we produce enough for everyone** : 2884kCal/capita/day, against about 2000kCal/capita/day of recommended diet. Indeed **821 million people lack food**, but that is because enough for 250 million is simply wasted between the US and Europe **while “developed” countries eat way more than what they need**, a good part of it imported from countries where people are starving. Add to that the over-consumption of meat (which requires a lot of land and means compared to vegetables), and you get huge surpluses, even if the population was to increase. You could argue that it will be barely enough with **the population increase**, but trivially a population can not increase above the level allowed by its food supply.
- Energy: We do not think about it much, so it is natural we waste large amounts of it. Think about each time you cook pasta and pour the boiling water down the pipe. Any idea how many energy that is? Less directly, have a look at where the products you buy come from. Imagine how many kilometres of transportation were required to bring all the raw materials to that place, then send the finished product to you (transportation accounts for about a quarter of the world's energy consumption). Besides a good margin for improvement on consumption, it is worth noticing the **sun alone irradiates on earth about 7500 more energy than how much we consume**. That is a wealth of energy available to everyone, everywhere (except at the poles), in the form of PV electricity, but also wind and heat.
- Living space: Over half of the world's population is living in cities, which might give the impression of

a crowded world if you live in one. However, most of the surface is free and if we were to be more independent from our urban centres **there are a lot of former rural centres** which we could come back to. It is more a matter of managing that resource in a way that is integrated with the environment rather than destroying parts of it for optimal management.

- Money: per se, it has no value. What is a currency worth if you can not buy food with it? However, nowadays it is an indicator of how much other goods you can buy, so what your quality of material life is. **World wealth average is 63'100\$ owned per adult**. That might seem a lot or very little, depending on where you live. It is more relevant to look at whether everyone earns enough money for daily purchases. In that respect, thousands of billions of dollars are exchanged everyday (**5.1 trillion \$/day on the Foreign Exchange market alone in 2016** – it's a market where currencies are sold and bought : like 1 euro for 1.10 francs). If only a fraction of that was flowing through individuals, we would be earning (and spending) hundreds of dollars per day and per inhabitant.
- Natural sinks: This is where we might not have that much margin. Natural sinks are the mechanisms through which our waste (for instance CO₂, plastic, chemicals etc.) is reabsorbed by the environment. They require well functioning ecosystems and natural cycles (forests, deepwater ocean, bugs and bacteria etc.). That is where we are at the highest overshoot today and where we will need to drastically reduce our production of waste and the damage we are causing to those sinks.

Note that, besides those material needs, what we also need are recreation moments and those are often a matter of time and company. Both things that are pretty much free and require nothing else than having someone physically around. Both things that the current trends are taking away from individuals.

Conclusion

We know the world is changing but its incredible complexity makes it impossible to predict the path it is going through. Instead this section used a physical approach of studying the “steady states” of the system. No matter through where we develop, we should get to one of the three: either we go extinct, or we totally artificialize our environment and social interactions, or we reduce pressure on natural resources by better sharing what we have and re-centring our societal goals around satisfying vital needs and spending time together.

Note that the planet is vast, so the later two could coexist to an extent for a certain time, but a system that has its own growth as a goal will always get into conflict with any other kind of system, which is actually already happening, so ultimately one or the other state will prevail globally. However, can you think of another final state that relies on a completely different logic? Please post it as a comment.

Now that we know how we are changing and where that is leading us, should we do something about it? And is there anything we can do in the first place? Keep reading for my opinion on that, but beware that we are leaving the realm of objective facts to get into the more complicated one of values, so you might want to go for a walk before. Thanks again for reading, though.

III. Why the rush?

So far we have seen how humankind is evolving and what the long-term scenarios might be. Now is it worth picking one of them and trying to go after it? Does it make any sense at all? Is it the right time? Are you the right person? This section comes back to the complexity of the changes under way and why that induces a scary uncertainty that is worsening with time, thus an urge to act. Then I will try to express how thinking and acting according to these ideas gives a sense and interest to my life. Finally we will try to relate these issues with moral values we might share.

a) Make sense of chaos

As seen in page I. [We're changing because we're not sustainable](#), multiple factors are driving the evolution of our society, interacting among themselves and making for extraordinarily complex system dynamics. You might have noticed I barely tried to dig into and discuss the causalities and the mechanisms I have evoked. You might have felt frustrated. Well, that is because they are indescribable, there will always be something left aside that can change the whole game. Instead, the previous sections tried to give broad probable lines. The only certain thing is that we need to change, because the way we are functioning now is unsustainable.

Physicists call it chaos and it is a striking phenomenon. Consider a system as simple as an articulated pendulum. Two sticks hanging one after the other from a nail. Give them a kick: they will oscillate in a pretty familiar and predictable manner. Now hold them over the nail and let them go. They will break into an agitated dance that has nothing to do with whatever your brain might be trying to anticipate. It is not only your brain. I have done it myself: try to write down the equations of the pendulum's movement, then simulate them on a computer. You will see a movement that is similar to the one of your sticks, but never the same. If you do a second simulation, barely changing the starting position (and by barely I mean a millionfold of the first one). Let it run for a mere couple of seconds. Then compare both situations. They simply have strictly nothing to do with each other.

[Random articulated pendulum gif from giphy.com. I have my own simulations but making a gif now would take a while...](#)

So much about our trivial articulated pendulum. How can one even imagine to predict something as complex as the course of humankind, interacting with a way wider ecosystem? Let aside climate change. That is comparatively "easy" to simulate because the atmosphere and the oceans are a slow and uniform system, and yet scientists have been doing mistake over mistake about it (not always in the alarmist direction). In science that is just normal trial and error of simulations to develop models that make sense of the world around us – yet always fail to give a full account of it. But predicting human evolution in the context of a hardly predictable changing climate? No way.

And that is the first reason to act now and counter our current unsustainable way of being. For pure fear of the unknown. Not the stimulating unknown of a calm horizon you want to drive across. The terrifying unknown of an unmapped swamp at dusk, where you know you will fall victim of quick sands, poisonous frogs or slower infected mosquito bites. If you are to cross such a swamp, you should first wait for daylight, not be alone and take step after step, carefully, rather than continuing to run full speed ahead as we have been doing in the past years.

b) Make sense of our lives

Achieving a sustainable world (in the sense of social sustainability presented as third option before) requires a large collective effort. It requires discussing the solutions together to then build them in collaboration. It therefore requires thinking about these complex issues, building friendships and creating hope. Even if the prospects are gloomy, I never enjoy conversations more than when they are around existential sustainability topics. There is a cliché that young people always think that they know better and want to change the world. In this case, we are all back to youth, effectively changing the world. It is sometimes frightening to not know whether we are doing the right choices, because we never thought it all through, but if we can share and be with others to make our mistakes as well as the right things, it is the process that is pleasant per se. One way or another, by thinking and discussing about these topics we are building our understanding of the world. Do you know that feeling after you have cleaned your apartment or your office, putting things away, and for a moment you just know where everything is and can enjoy sitting back on your chair and look at what you have done? I imagine that is the feeling we will get by taking care of our common house. More importantly, it is a way of evading our current way of life, where we are prisoners to our job position, whether we like what we are doing or not. We are seemingly bound to watch our politicians take the wrong decisions and we are supposed to stay quiet at home enjoying movie series. Going to the gym helps us feel better about it, because we feel we are doing something for our body. Is not the feeling we are doing something for our fellows and our natural world even better?

c) Make sense of our values

The two first reasons to change now and quickly rely on survival instinct and herd instinct. That gives me good hope that they will ultimately prevail, in one or another way, in preventing complete environmental collapse. The third reason relates to our moral values, which are more of a social construct but also provide a rationale to how we should address sustainability issues taking into account the social component. You may not adhere to these values or decide to be cynical about them, but then let us know what your motivation is to get out of bed every morning.

In my view (that of an European early Millennial), thinking of the mounting inequalities related to our current lifestyle is a strong motivation to act. On the further side, people in remote countries are suffering and dying every day to provide the goods that I can consume at home. On the closer side, I see friends struggling to find a meaningful job and a sufficient income while we know a happy few are earning as much as half the world's income annually just from investing their immense wealth. Note that many solutions proposed to mitigate climate change nowadays do not address this issue.

At the harder end of this, though, is the idea of so much life being erased from earth due to our lifestyle. Not only human life, but also wild animal life (the elephants and such you might have heard about), bugs (remember the collapse in bee populations?) and in the darkness all kinds of vegetal life. It is not much the death of individual beings that affects me, but the disappearing of entire slices of ecosystems to which I feel easily bound as soon as I am out in natural spaces, hiking in the mountains or just enjoying the sun in a city park.

Then there are some individuals whose death or illness I can not with certainty blame on how we live today, but which might be related. Think of friends taken away by cancer (which prevalence likely increases with our exposure to plastics and chemicals in everything we touch and eat) or elders left to age in retirement homes because our social fabric is not solid enough anymore to provide them with care and company at home. Could it not be different?

Conclusion

This page gives some of the reasons why I feel I can not live my life without thinking about the sustainability challenge. Avoiding cascading collapses of our ecosystems and our society. Avoid wars. Work with others and

feel better with them. Live according to the values my parents and my educators have given me. There certainly are other reasons and you might feel more or less concerned about them, but you are now given the choice: change or not? And how much are you ready to change?

It would not make sense if all of us went to work into « sustainability related » companies and involve in activism and political duties. But there are things we can do in our everyday lifes to lay with all our weight on the right side of the change and abstain from working against it. The next section shares some ideas for that.

IV. What to do?

The previous pages show how our global system is on an unsustainable path and becoming more unstable by the day. They give three worlds to which we might be headed: an Earth free of humanity ; a humanity cut from its earthly roots, locked into technologies for its survival ; and a humanity more aware and respectful of the life system around it. The decades to come will be critical to choose which way we are going, and the last section explains why I choose the third path and decide to do as much as possible to get there. Now what can we do, as the helpless individuals we sometimes feel we are ?

The first clue is already given in the first part: since the most pressing issue is that of unstable society, the first thing to do is call for more democracy and protect our human rights. The next pressing issue is that of outrunning natural capacity to supply enough for our production, and to change that we will need to change our economic system and its logic of profit. The last issue we will be faced with is the depletion of natural reserves of raw materials, so we will need some technical solutions to make the most of what we have available. But that only comes third.

a) Just do something

This is the first, trivial, thing. If you do not think about the issues we are facing, if you do not speak about them, if you do nothing about them, there is no way you will make a difference. But conversely, in a world so complex, the tiniest hint in the direction of a change might have huge impacts. It can also backlash, but lets assume as long as you give enough of these small kicks in a consistent way, they will overall push change in the direction you wish.

The first step is thinking about the changes you want to implement. I like to use time usually deemed “useless” for that. Public transportation journeys, cooking time for meals, effortless walks outside... Embracing the void of my mind when things get boring rather than rushing to a smartphone to refill. Some food for thought is needed, of course, news and posts can provide it, but knowing who is behind the text and having diverse enough sources to get a complete picture is important. Internet provides every piece of information we might wish and that is the challenge: the world is never how we wish it would be. And at some point we have to decide what we believe and stick to it at least long enough to do something about it, even if we might want to change our mind later.

Idle moments can also be enjoyable with friends, and that is the second step: share. You never know where a conversation is going to get you, as long as you allow it to proceed, with its silences and sometimes its hard feelings. Because sustainability touches every aspect of our life, chances are that any discussion will provide something to think about along those lines. Then there is the difference between plainly disagreeing and try to convince each other in an usually endless discussion or understanding where the disagreement lies, which at least allows to see when the discussion can end.

The last step after you have thought and discussed about what might be good to do is to do it. Put your proposals forward wherever you can: at home, at work, and most of all on the public domain: if politicians won't listen to you, there is no shortage of newspapers to write to, of associations and movements that can use one more brain and two more hands.

You might feel there are a lot of constraints to action, so better be flexible and accept to postpone some things. Plan ahead when you want to think about what changes you are ready to go through, then plan when you are going to cope with the details of doing it. Big changes in one's life (moving out, changing jobs...) are the best opportunities to align one's lifestyle and ideals: live closer to the ones we love, negotiate less working hours with our employers, involve with associations we feel close to... Because those are stressful periods though, we tend to just try to be over with it and give up, thereby missing the opportunity. So let us take a step back before such periods. Changing a routine is relatively difficult, but the impact of that is dwarfed by

what can be achieved if you change your life so your routines can be sustainable.

b) Cope with complexity

Knowing what to do is alone a challenge. We now live in a society where “sustainable lifestyle tips” are everywhere and “Top 10 things you can do to reduce your carbon footprint” can easily be found (have a look if you never came across one of those, I will not come back to it for now). So as for the individual level we probably know what you “should (not)” be doing. Keep in mind those are very tiny steps compared with the impact of the system around you, but being comfortable with your own lifestyle is also a pre-requisite to be able to think about the lifestyle of society as a whole. Out of all the things we are told to do, I focus on the AABCC of the most polluting ones: **A**irplane+**A**utomobile, **B**eef+**B**anks and **C**ooling/Heating+**C**onsumption. These are fields where any compromise is technically very difficult, so we will have to do way less of them (like 10 times less). It is not about stopping driving cars or eating beef altogether – it is about to first think if we can divide by, 5 something unsustainable we are doing, then looking for ways of reducing that impact by a further half. The impact of these little private choices should not be minimized, even if they are clearly not enough. There is a huge supply chain behind them and organisations monitoring these behaviour changes which then influence how the whole system will be redesigned next time there is an opportunity (changing an existing infrastructure is like if you were building a new house – not something you can do often, but you can completely change it to fit your needs). Directly or indirectly, all human activity is geared towards enabling our everyday life – that is why advertising is so important, to make sure our everyday life provides enough “demand” to keep the system running. No matter how complex the system might seem, your lifestyle change will have an impact.

Now conversely, the system conditions the lifestyle you can have. If there is no bus line, no local market near you, you will be bound to drive to a shopping mall. You might have to pressure some part of the system to get what you need to live how you want. We are back to the citizen role in policy making, and there individual choices will be all the more impactful as they are shared by others and/or can be transposed at higher levels. Some actions can not be taken at the level of your house, but maybe at the level of the neighbourhood, or the city, or the country. That is another way to reduce complexity: implementing changes at the most local level possible. It starts with speaking to your friends about it, as said before, but also getting involved as a citizen, vote for your representatives and participate in discussions organised by your city hall. Once your neighbourhood or your city has shifted to a more sustainable way of functioning it can in turn address the state to ask for broader changes and so on. For this, we need a well functioning democracy and well functioning means of communication, both things at risk today. How do we get that back?

c) Underlying principles: life, respect and trust

Last comes the question: how do we ensure our actions consistently push in the direction we want? For that, it helps to have principles or values that you intuitively believe will lead where we want to go, since we have shown it is not possible to rigorously predict where a given action will take us – the world is just too complex. You might think for years on given issues, it is always possible to find a dataset that contradicts some of your assumptions or a further mechanism that creates a backlash. Furthermore, focussing on the complex consequences of one’s decisions can overshadow which objectives we are pursuing.

Religions used to provide this “guide” for every decision in our lives, and they still do in many countries. In my opinion, we all have a faith of some sort even if we might not call it so. What is yours? Faith is complementary to rational thinking, not opposed – indeed many physicists have a confession. Faith explains the world once we have reached the limits of what we can understand. And because of chaos, these limits always exist. Now, I do not believe in an omniscient God, neither do I want to convince you there is none. However, as was

already manifest in the previous sections, life is precious to me. Its complexity far exceeds what I can rationally understand. The fabric of life is a beautifully intricate system that is made of countless births and deaths and pleasure and suffering. So is society, where living beings are the same as we are (if you are not a bot reading this).

When it comes to taking a decision that will impact this fabric, I choose aesthetics as a goal. There is a lot to do to make our cities, our parks, our forests and our oceans nicer looking. A lot of waste to collect, a lot of buildings to be renovated, a lot of plants to be grown, and mainly a lot of spaces to be left developing as they please to regain that touch of what some call “wilderness” and is so necessary for the preservation of diversity and of the natural cycles that we rely on. I am not worried we will get bored when we will be trying to reach a sustainable world, because there is always something new to do, something nice to create.

Lastly, I choose respect and trust as guides to reach that goal. Leave space to others but be empathic with them to be available when help is needed. Trust them when they ask for help and trust them when they are trying to help me. This works the best when speaking to individuals. Enterprises on the contrary can only be trusted as long as their economic interests are preserved. As for governments, the economic logic today makes them helpless, because they bind themselves to taking the decision that is seemingly the optimal one when it is taken (and only then, the future tells its own story...). There, transparency and democratic involvement are necessary.

There are entire pages to be written about it but I will leave it at that now.

Conclusion

This is pretty much what I wanted to say. Please do something. Maybe not proactively as a main activity, but keeping in mind environmental and social limits in your everyday life. Keeping in mind what is the long term perspective you wish to see realised. The future is now, since the smallest flick in the river of life might generate destructive as much as constructive swirls downstream. The past can not be changed and therefore has to be respected and understood as it is.

It is easy to be scared for us and for our children given the challenges we are faced with. It is fear that compels me to write this blog. But as a soldier in the war of ideas, as long as I am fighting I can keep the fear at bay and enjoy what is going on. After all, ideas are not like weapons. They are more like children, who fight each other without really being able to harm each other and get weaker or stronger as they grow up. Who can say who the parents are? I am only the caregiver of those I write here. Now they are to your care. May they strive.