

Planetary Health

Citation for published version (APA):

Martens, P. (2023). *Planetary Health: The Recipe for a Sustainable Future*. Maastricht University.
<https://doi.org/10.26481/spe.20230421pm>

Document status and date:

Published: 21/04/2023

DOI:

[10.26481/spe.20230421pm](https://doi.org/10.26481/spe.20230421pm)

Document Version:

Publisher's PDF, also known as Version of record

Please check the document version of this publication:

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Maastricht University

Inaugural Address

Pim Martens

Faculty of Science and Engineering

Planetary Health: The Recipe for a Sustainable Future



Planetary Health: The Recipe for a Sustainable Future

"Human beings have made so many beautiful things that I often wonder when we are going to make the Earth more beautiful again instead of depleting everything." - Paul Crutzen

ISBN: 978-90-5681-496-0
NUR: 884, 930

Cover picture: Jos Willemsem

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Planetary Health: The Recipe for a Sustainable Future

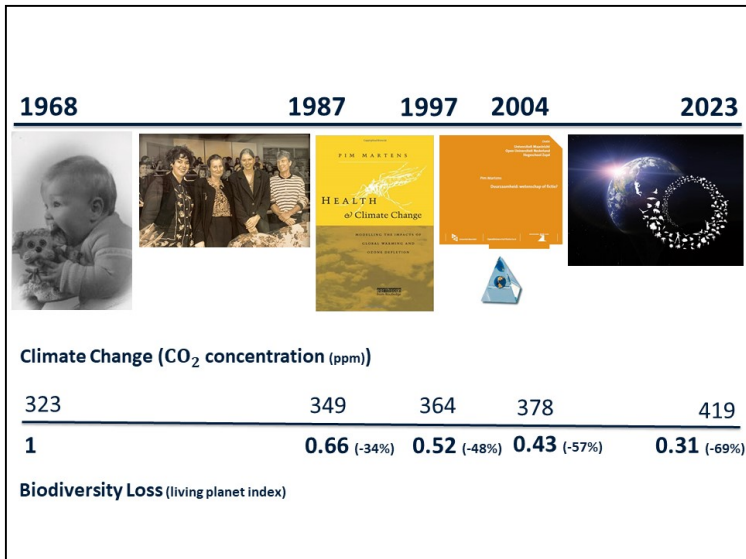
Inaugural Address

Delivered by the acceptance of the Chair 'Planetary Health', Faculty of Science and Engineering, Maastricht University, The Netherlands.

21 April 2023

Pim Martens

Dear Pro Rector, dear family, friends, and colleagues: welcome to the inaugural lecture of the chair Planetary Health, entitled: *Planetary health: the recipe for a sustainable future*. Of course, I will explain the field of Planetary Health in more detail later. But first, I'd like to take you through how it all started for me. I will also give you a glimpse of the two most important health problems facing our planet: climate change and biodiversity loss.



I was born in 1968 as the seventh child in a family of eight children. At that time, the concentration of the important greenhouse gas “carbon dioxide” was about 320 parts per million air particles. I have put the number of animal and plant species, the biodiversity on Earth, at 1 for convenience.

In my youth, I wanted to become a forest ranger, but because you couldn't study that at a university, I started studying environmental health sciences: a degree that, at the time, was one of the first to specifically connect the health of the Earth with our own health. When I graduated in 1987, the greenhouse gas concentration had risen to 349 parts per million, and the biodiversity on the planet had decreased by 34%.

Ten years later, I got my Ph.D. in applied mathematics, on the mathematical modeling of the effects of climate change on our health, and, as some of you know, I was standing here about twenty years ago as well. I then gave my inaugural lecture concerning the Chair Sustainable Development.

Despite my dean at the time thinking 'sustainability' was like fishing in troubled waters, the concept of 'sustainable development' has been scientifically developed in recent years.

However, all good intentions, international treaties, agreements, and technological developments have not prevented that the current CO₂ concentration has risen well above 400 parts per million. Today's biodiversity is only 30% of what it used to be when I was born in 1968.

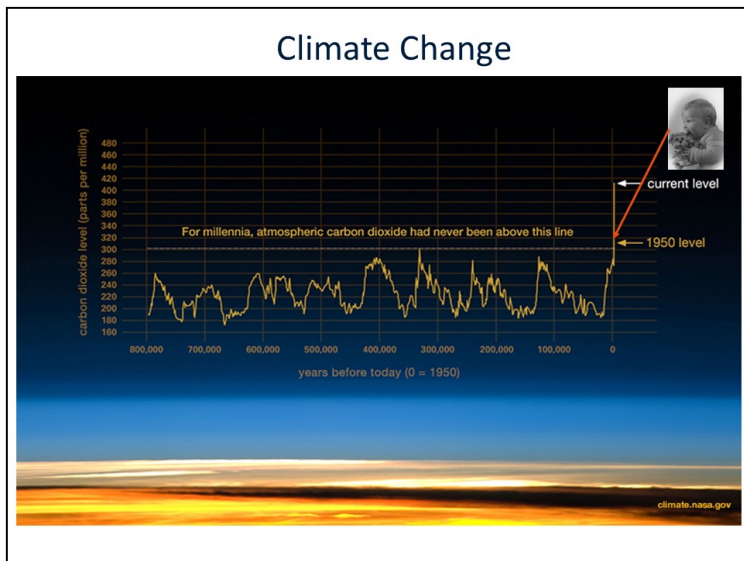
The health of our planet is therefore no longer what it used to be. And this is precisely why the chair Planetary Health, which I accept today, is more important than ever.



Before I tell you a little more about the health of our Earth, let me take a look at our health. By most standards, human health is better today than at any time in history. Life expectancy has increased from about 45 years in the 1950s to an average of 70 years today. Mortality rates among children under five also dropped significantly worldwide.

But that progress comes at a steep price. It is common knowledge that the Earth has changed considerably in recent centuries due to increasing economic and population growth. This leads to our oceans being overfished, our lands being sprayed with chemicals, and our forests being cut down. These changes began centuries ago, but they have gained momentum since 1945. These changes have been so significant in recent years that scientists see the beginning of a new geological era, the 'Anthropocene.' An era in which man has become the most important factor in degrading the Earth. These changes affect not only our atmosphere but also our soil, water, and biodiversity.

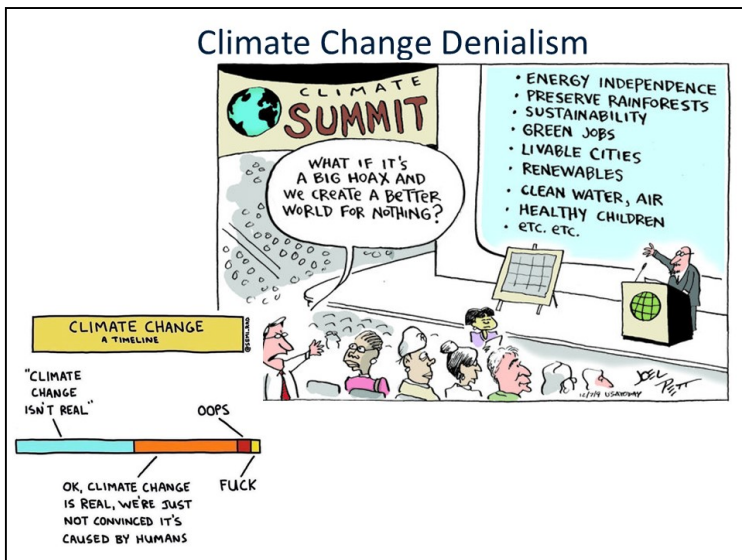
Let me take a closer look at climate change. Our climate is changing because more and more greenhouse gases, including the carbon dioxide I mentioned earlier, are released into the air.



Other greenhouse gases include methane and nitrous oxide (laughing gas). These gases act as a blanket around the Earth, causing our Earth to warm up. Climate change is, therefore, more and more tangible. In the Netherlands too. The temperature on Earth has changed more often in the last millions of years. But those changes always happened very slowly.

It's a big difference with the current temperature rise, which is actually very fast. In the time of modern man, it has never been as warm as it is right now. Moreover, modern humans have been walking the Earth for more than 100,000 years.

You can see again how the concentration of CO₂ has changed since I walked on the Earth. This change likely causes the temperature to rise by no less than 1 to 6 degrees Celsius at the end of this century (compared to the period 1980-1999). This makes it much drier in some places and much wetter in other places. All this has major consequences for life on Earth and, therefore, also for us.



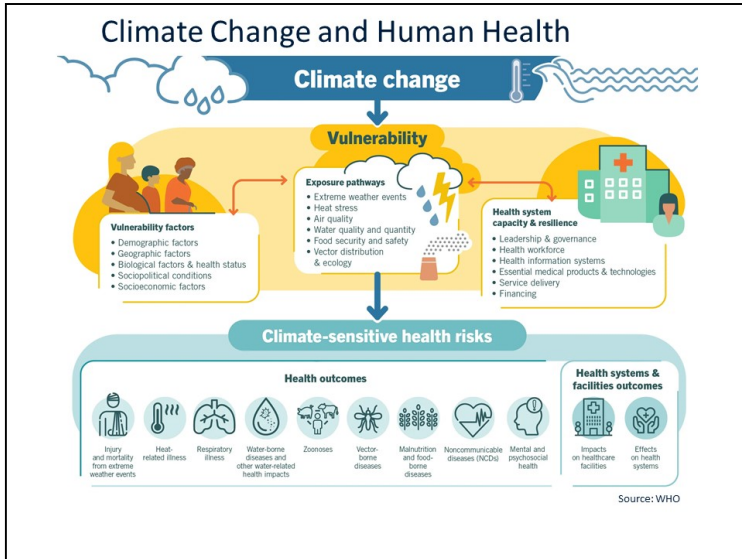
There is no longer any doubt about climate change and its cause. Scientists agree that our activities are the cause of greenhouse gas emissions and global warming. Despite the scientific evidence that climate change is caused by humans,

the number of climate sceptics is growing. Almost a third of the Dutch people think people play no role in our changing climate. But climate sceptics come in different shapes and sizes.

Some have a certain suspicion of scientists, which is often linked to a distrust of the government. Others show great resistance to the climate measures that the government wants to impose on citizens. It is not only about money, but also about the violation of their freedoms and their world view. In short, the so-called climate sceptics cannot be lumped together. It is therefore a pity that many scientists and politicians do not understand these feelings of sceptics and don't take them seriously.

Even worse, the (fossil)industry uses deliberate tactics to create doubt, such as supporting lobby groups that deny the scientific consensus on climate change. Or politicians who consider climate science a "dark, witchcraft-like quasi-science." And finally, the media often disseminates incomplete or incorrect information about climate change.

There is still a world to be won regarding climate change communication, and ignoring climate sceptics is not an option. But, even more than winning over "climate doubters," it is critical to inform the ignorant majority about the change in our climate. Here lies an important role for us scientists.



So our climate is changing. And climate change is not only a symptom of our planet getting sick; it also leads to rising sea levels and the melting of our ice caps – to name a few examples.

A changed climate also affects our health in many different ways. There are direct and indirect consequences: consequences that are felt immediately and consequences that only become visible over time. We estimate that currently, hundreds of thousands of deaths worldwide are caused by climate change.

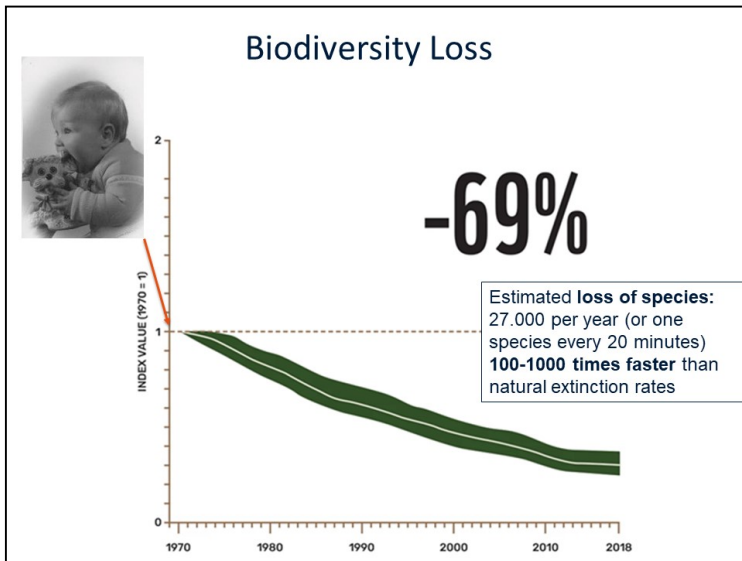
For example, we can expect increased deaths due to heat waves. At a higher age, people are less able to regulate body temperature, so in particular the elderly are vulnerable to this. By 2050, heat waves are expected to increase the death rate in Europe by 120.000 per year at an economical cost of €150 billion if no further action is taken.

Seasonal changes — with certain seasons starting earlier and lasting longer — can also adversely affect human health. This is especially true for people with hay fever and allergies.

[illegible]

A few years ago, together with the University of Liverpool, we made computer simulation models for some of these infectious diseases. Here is a map that shows the increasing distribution of the tiger mosquito. A tiger mosquito is a mosquito that can spread diseases such as dengue fever and

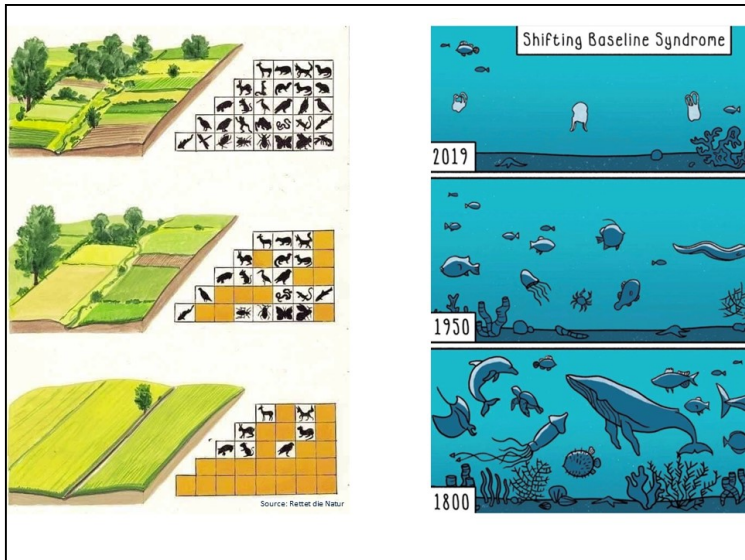
West Nile virus. It is no rocket science to realise that a warmer climate will increase the distribution of cold-blooded insects. Many of our projections were met with cynical reactions, but, as you can see, our models have been quite right: the mosquito is now widely distributed in Europe. A few years ago, this mosquito was found in a number of Dutch places, including Valkenburg. In the future, we have to take into account that several tropical diseases will, most likely, be here to stay.



A - in my view - more important problem than climate change is biodiversity loss. Biodiversity is all life that has spread over the Earth over billions of years and has evolved into the most wonderful variety of forms and species. This species richness includes all types of plants, animals, and micro-organisms. In recent years, biodiversity has declined at an alarming rate, mainly due to human activities such as changes in the use of land, pollution, and climate change.

Scientists warn that one million species - out of an estimated total of eight million - are threatened with extinction, many within the next few decades. Some researchers even think we are in the middle of the sixth mass extinction in Earth's history. Previously known mass extinctions, such as the

extinction of the dinosaurs, took ecosystems millions of years to recover. Children born now will be able to see less than 1/3 of the animal and plant species in their lifetime than I could, and this trend will continue.



The expansion and intensification of agriculture are a major cause of biodiversity loss, yet this often goes unnoticed. One of the reasons for this is that our powers of perception are very flawed.

This is called the *shifting baseline syndrome*, the gradual and unseen shift from what we consider normal. This means that we no longer know what we are missing. Now we may be happy seeing a yellow-bellied toad, but our rural areas used to be much more widely populated with all kinds of animals.


Whether it's bad that you suffer from the shifting baseline syndrome is questionable. If you are happy with every animal you see, it is not bad at all that you suffer from this syndrome. You probably won't even realise you're suffering from it. However, if you are concerned about biodiversity in our country and the world, it is a different story.


It is, of course, even worse when policymakers suffer from the syndrome. For example, a well-known politician recently said: "I was in a barn that was packed with birds. Packed." So if it is considered normal that no black-tailed godwit breeds in most pastures, even though the barn is packed with birds, then this is quickly accepted as a normal situation, and no action is taken.

And when politicians suffer from the shifting baseline syndrome, it is not surprising that most people live unsuspectingly and do not realise that animals and plants are dying and getting extinct. As with climate sceptics, ignorance is often the cause of the syndrome.

Biodiversity Loss and Ecological Integrity

Eine Kleine Nachtmusik
Serenata K525
for piano solo¹ W. A. Mozart (1756-1791)

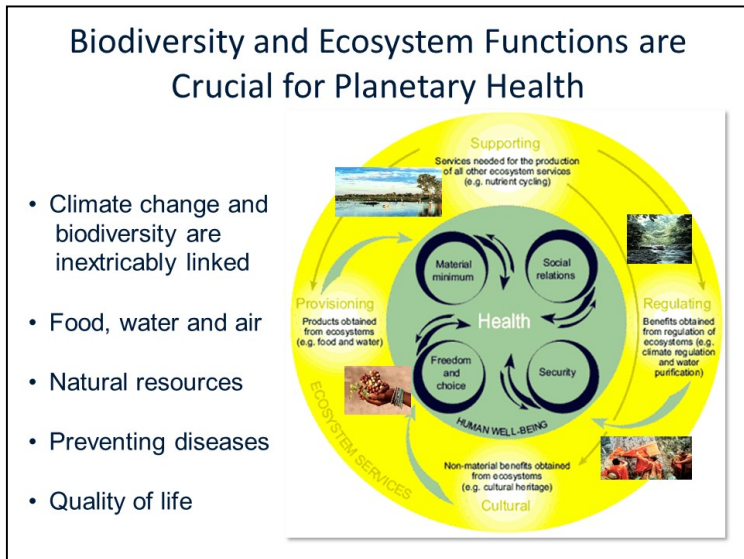





¹originally for orchestra
© 1999-2009 Virtual Sheet Music, Inc.

But why is the loss of biodiversity so important? In addition to the fact that every living being has the right to live, all these species work together in an ecosystem and thus ensure balance in nature. The more diverse an area, the more connections between organisms, and the more resistant to changes such as climate change, diseases, and pests. If one species can't handle a change and goes extinct, other species can take over without the whole system collapsing. But this cannot be done indefinitely.

You can compare it to a piano play, such as Mozart's 'Eine Kleine Nachtmusik.' If you remove one note, you will undoubtedly hear it's 'Eine Kleine Nachtmusik.' But if you leave out more and more notes, there will be little left but an unrecognisable whole. The same is true when you look at our biodiversity. With the extinction of animal and plant species, the ecosystem will eventually change, which can have far-reaching consequences.



It is impossible to exactly know what the consequences of biodiversity loss will be for humans, but we do know that the diversity of nature is essential for many things we take for granted. For example, nature plays a crucial role in combating climate change. Those who affect forests, tundra, and oceans, cause greenhouse gases to be released and the Earth warming up faster. In addition, a biodiverse nature forms a barrier against the consequences of extreme weather, such as storms.

Our food, but also clean water and clean air, depend on nature. Our energy sources, raw materials, building materials, and medicines come from nature too. We may have a cure for

cancer within reach if we make an effort to protect our ecosystems and plant species. Nature and biodiversity ensure our health, well-being, and quality of life. For example, people feel more comfortable in nature. Various lifestyles and cultural practices could not survive without the nature on which they depend. Maintaining biodiversity is important.

Ecosystem Functions of Coral Reefs: Source of New Medicines

Alzheimer's Disease

*The substance this worm, *Paranemertes peregrina*, uses to paralyze its prey can also serve as a treatment of Alzheimer's disease © Harbor Branch Oceanographic Institution at Florida Atlantic University*



Cancer

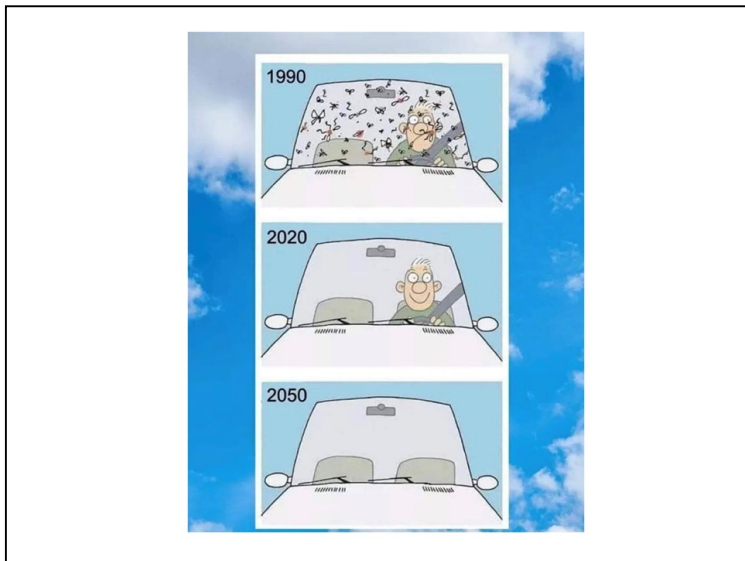
This coral produces an anti-cancer drug currently under preclinical investigation © Harbor Branch Oceanographic Institution at Florida Atlantic University



Let me illustrate this with an example, our coral reefs. Coral reefs worldwide are constantly stressed by global warming, overfishing, and declining water quality. Climate change is the biggest threat to coral. If the water is too warm, corals expel the algae living in their tissues, turning the coral completely white. This is called coral bleaching. The algae and the colour can return when the temperature of the water drops. But if that takes too long, the coral may die. Over time, the dead coral becomes overgrown with other algae from the sea.

Irreversible loss of coral reefs would be catastrophic. Although reefs cover only 0.2 percent of the ocean floor, they are home to at least a quarter of all marine species. Coral reefs protect against storms, are a source of income, and they provide food. They play a vital role in the life of the oceans. Coral reefs can

also be a source of life-saving medicines, as these two examples show.



Perhaps it's time for an example closer to home that shows how our biodiversity is declining and illustrates the 'shifting baseline syndrome.' This is a well-known phenomenon for those who obtained their driver's licence before the nineties. If you drove from Maastricht to Groningen by car, you had to remove many dead insects from your windshield at a gas station every so often (the windshield wiper usually didn't help). Now you can easily drive from Maastricht to Rome without doing this even once.

Insects pollinate many of our fruits, flowers, and vegetables and are, therefore, vital to our food. So I don't have to further explain that human survival is closely linked to all life on Earth.



We, as humans, have affected the health of our Earth to such an extent in recent years that not only nature is suffering; our health suffers too. If the Corona crisis wasn't yet a clear enough signal that we are not on the right track, this all certainly is: if we do nothing and continue with a 'business-as-usual' lifestyle, we will undoubtedly see further consequences in the future.

When I look around, I see some unhappy faces. I hear you think: "I thought I would have a nice afternoon, yet, now I hear all kinds of scary stories about climate change and biodiversity loss." In my experience, the so-called "doom and gloom" stories - even how true they are - don't really stimulate us to deal with the problems we see around us.

So, from now on, we will look at the future of the Earth from a different perspective. I will reassure you: the remainder of my inaugural lecture will have a more positive approach, and we will mainly look at what we can do. To prevent the 'climate stress' hitting you further, this brief intermezzo:



But is there still something to laugh about?

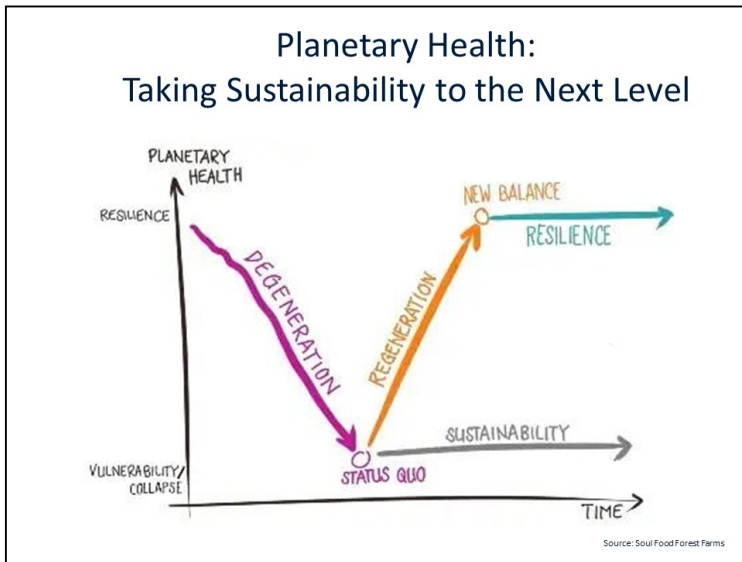
Although there is not really much to laugh about, there is hope. As I have shown, our health and the health of Earth's ecosystems are interrelated. Understanding this allows us to change our values and priorities. After having been a professor of Sustainable Development for almost 20 years, I know that 'sustainability' alone is not enough.



Sustainability has become a buzzword. You can wake up in sustainable pyjamas and brush your teeth with sustainable toothpaste. Then you take your sustainable car to your sustainable job, check your sustainable shares, eat sustainable meat and go on a sustainable holiday. In short, sustainability has been hijacked by commerce and by governments. Their view of sustainable development has been mainly subservient to the dogma of economic growth with little regard for the health of our planet. I have just explained how shortsighted this is: look at our current climate crises and the global decline of biodiversity.

Let's take a closer look at the concept of sustainable development. The Brundtland report defines sustainable development as: "Development that meets the needs of the present generation without compromising the needs of future generations, both here and in other parts of the world." So it's all about the needs of man. Clearly, 'sustainable development' is mainly about people and is, therefore, an anthropocentric concept. The same applies to the many, often well-intentioned, concepts that followed the Brundtland definition: the "Sustainable Development Goals" or the "Donut Economy"

to name a few. Just like the sustainability concept, they put people at the centre. And that's not going to work.



Another shortcoming of the concept of 'sustainable development' is that it quickly implies a status quo, especially with "trying not to do more damage." But that is not enough.

Instead, we – as humans – need to rebuild, restore and regenerate holistically. We need to realise that humans are part of nature, not separate from it, and that we all have a positive role to play. We must realise at our very core that human health is the planet's health and vice versa.




With this realisation that both scientifically and socially 'sustainable development' is at a dead end, I obtained my second Ph.D. in 2020 in Biological Sciences on the subject of 'sustanimalism.'


This research shows that animals are hardly or not at all discussed in discussions about a sustainable future, and if they do, it is as an economic product or as a cause of climate change – think of cow farts, which contain a lot of methane. Because we increasingly realize that everything that lives on Earth is interconnected, and that humans certainly do not have a unique position in this, 'sustainability' is an outdated concept.


If we want to keep the Earth habitable, we must take into account the needs, feelings, and intrinsic value of everything that lives, including other animals: 'sustanimalism.' Sustanimalism goes much further than sustainability, in the sense that animal interests and respect for all animals (not just humans) and their natural environment are paramount here. Sustanimalism requires a new vision of our relationship with the living (and non-living) nature around us.

Planetary health is a field of interdisciplinary and transdisciplinary research dealing with the human health effects of global environmental change.


Planetary Health









Planetary health investigates planet Earth as being healthy or sick, realizing that, ultimately, human health depends on the health of the planet.



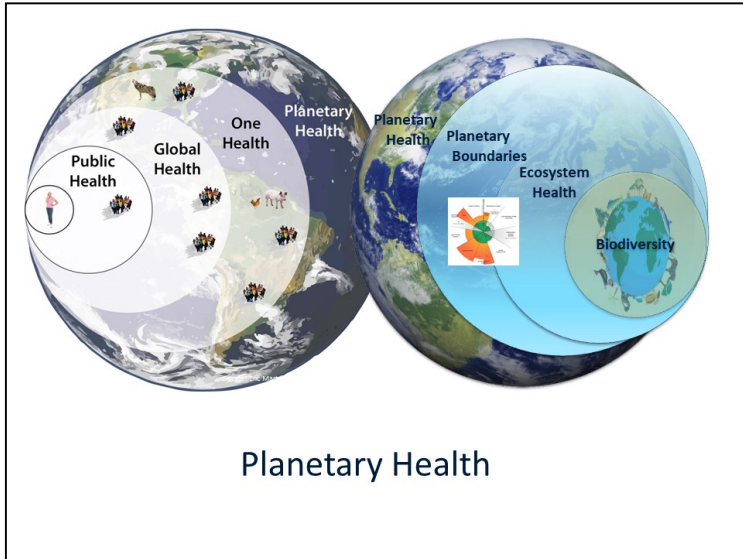


Planetary health is a holistic systems view of the world, recognizing the interconnectedness of the health and well-being of all life on Earth, and the need to regenerate natural systems, rather than simply minimizing harm.



A logical next step from sustainability, through animalism, is planetary health. However, here too, the previous definitions are too restrictive. The concept of 'Planetary Health' as launched a few years ago is too human-oriented. The emphasis is mainly on the consequences for our health through disturbances in the environment. Later definitions are already better, and the focus is more on the health of our planet, with the realisation that human health ultimately depends on the health of the planet.

However, for me, the field of Planetary Health is more than that. It is not only the realisation that everything is connected, but also the realisation that it is not nearly enough to keep the planet 'as it is.' Positive, regenerative development must take place to keep the planet and everything on it healthy. This also includes a different way of dealing with our Earth: a change of perspective.



In recent years, the term 'Planetary Health' has gained popularity within the medical and health sciences. But it wasn't always this way. When I was working on my Ph.D. research on the consequences of climate change on our health in the 1990s, the medical faculties, with a few exceptions, did not want to hear about this research. But thankfully, times are changing. And while the term 'Planetary Health' is relatively new, some underlying concepts are not. An important example is 'Global Health,' in which the population's health is studied globally. Or 'One Health,' which recognizes the interconnectedness between humans, animals, plants, and their environment.

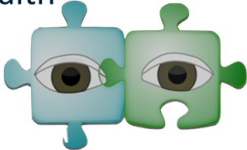
Another way to look at planetary health is from an ecological perspective. For example, 'EcoHealth' looks at how changes in the Earth's ecosystems affect human health. Another concept, 'Planetary Boundaries,' was introduced in 2009. Nine planetary boundaries were established within which humanity must remain without causing further damage to our planet.

However, Planetary Health does not replace these closely related concepts, but complements them. Even more so than the other disciplines just mentioned, the field of Planetary Health will be interdisciplinary and transdisciplinary. Given the complexity of the problems we face, it is imperative that



doctors, ecologists, social scientists, agricultural scientists, etc. work together.

There must also be cooperation outside the academic walls with governments, companies, and other organisations, the so-called transdisciplinary research. But to ensure the health of our Earth, Planetary Health will also need to embrace a holistic and perhaps even a spiritual approach and integrate it with scientific disciplines.

Planetary Health



- Understanding the System:
 - Two-eyed seeing
- Regenerate the System:
 - Nature based solutions
- Transform the System:
 - Paradigm change

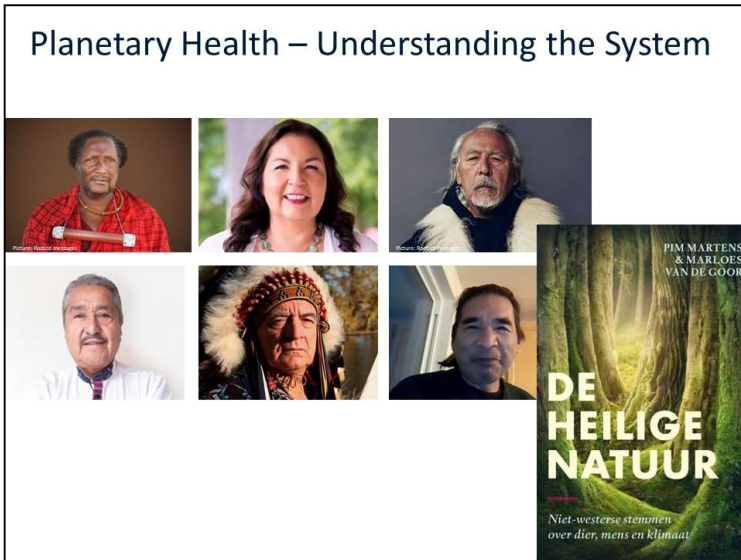


Now how can we get this done? There are, of course, several recipes that can make our planet healthy, but whichever recipe you prescribe, I believe it should always be a combination of the following three aspects:

First: we have to better understand the complexity of life on Earth and our role in it. Here we can make use of scientific knowledge, combined with the strengths of indigenous knowledge. The so-called "two-eyed seeing."

Secondly, repairing the damage we have done in recent years will be necessary. This can be done in a nature-inspired way.

Finally, we will have to change our view of all living things so that we don't make the same mistakes we made in the past. I would like to explain these 3 elements in more detail.



Globally, indigenous peoples and local communities play an important role in the management, conservation, and sustainable use of biodiversity and nature. Many indigenous communities live in areas of high biodiversity, where living in harmony with nature is essential for survival. These communities have strong ties to their territory and apply indigenous knowledge to protect, manage and utilise the natural resources in these areas. It has been shown that the ecosystems and species in areas managed by indigenous peoples are often less threatened than in other areas. And this is just one of the examples where we can learn from indigenous knowledge.

I have been fortunate enough to interview several Indigenous leaders – you can see them here in the photos – and I learned a lot from them. During my conversations with representatives of indigenous cultures, I noticed that animals and nature are spoken of with great respect. I want to give you a small impression of this by providing showing two of

these indigenous leaders.¹ First, you will hear Angangaq Angakkorsuaq, a shaman from Greenland. He talks about the connection between everything that lives and the changes he sees in his environment, caused by a changed climate. Next comes Chief Phil Lane, Jr.. He represents the Dakota and Chickasaw tribes of North America. Chief Phil Lane is critical about how we treat nature and the animals in it.

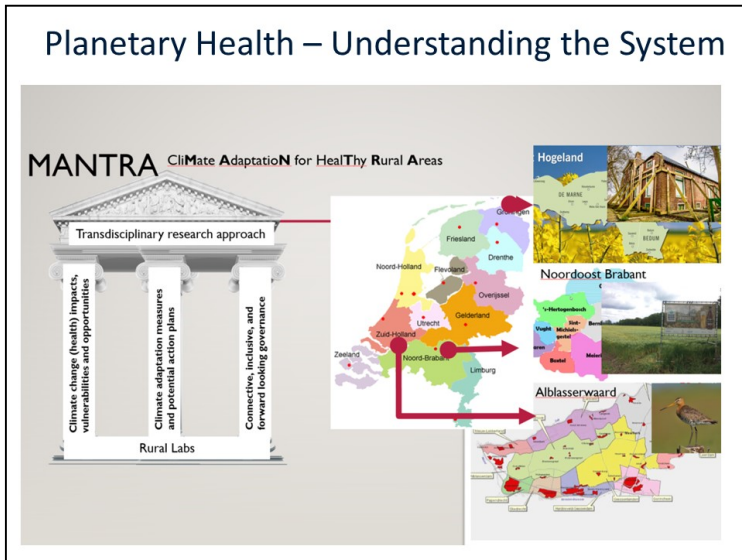


One of the quotes from Chief Phil lane Jr. that stayed with me is this one: "We are all indigenous to Mother Earth." And that's right. Of course, it is not only indigenous peoples who sense, often intuitively, how we should treat our planet. All of us know it somewhere deep down too.

In traditional cultures, humans are seen as part of nature. Equality, reciprocity, and co-evolution are considered guiding principles for the evolution and development of a society. Animals and plants are sometimes even considered relatives, as Chief Phil Lane just said. We can learn from many ancient indigenous cultures on our planet and, through them, also

¹ You can find the interviews on www.pimmartens.com

gain a better understanding of what a "planetary healthy" society could entail today.



The 'two-eyed seeing' principle calls for the art of bundling all available knowledge and skills. For example, we are currently working on a project – MANTRA – in which we look at how to mitigate climate change's effects on rural areas. We do try to adapt to climate change, but we still know little about the consequences of the various measures on each other. What seems good for one situation may be detrimental to another.

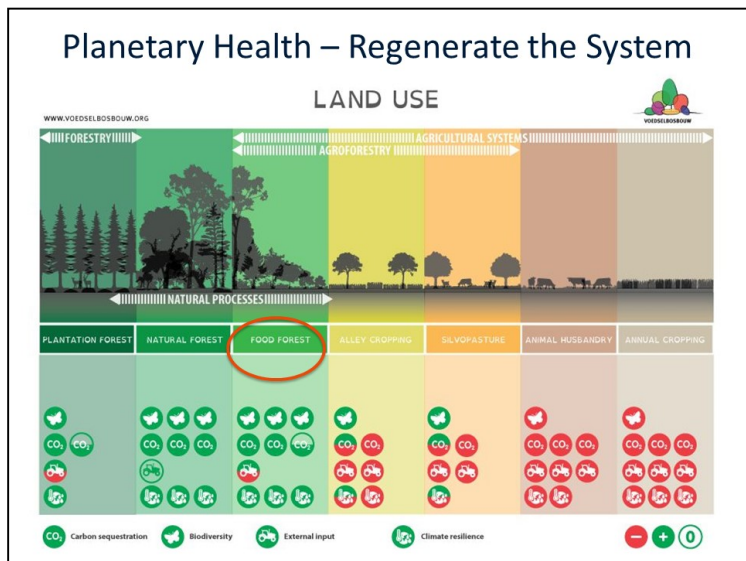
For example, a helpful water buffer can become a breeding ground for annoying, sickening mosquitoes. In MANTRA we, therefore, look at the whole context. In the research program, we use three Dutch areas as rural labs: the Hogeland, the Alblasserwaard, and North-East Brabant. In each of these areas, we enter into very practical, action-oriented discussions and work with experts from the political, municipal health, business sectors, residents, etc.

We not only use scientific knowledge, but we also integrate the knowledge of, among others, farmers and civilians - in other words: the local indigenous people. We call this

transdisciplinary research. If we also keep in mind the aforementioned definition of planetary health, and start to see it as 'two-eyed,' our cities and countryside will be able to become planetary healthy in the future.

Hand in hand with transdisciplinary research goes repairing the damage that has been done. We can do this in different ways, but I would like to explain one way in more detail. Nature-based solutions harness nature and the power of healthy ecosystems to protect people, produce food, and secure a stable and biodiverse future.

Protecting and restoring coral reefs and regenerative managing forests are all effective strategies for slowing the rate of climate change. Currently, over 130 countries have included nature-based solutions in their national climate plans.



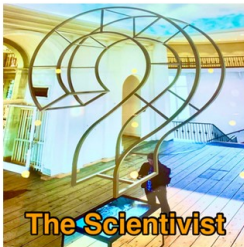
A specific example of this are also the so-called food forests that are appearing in more and more places in the Netherlands. Here we see that a well-designed food forest can be almost as effective as a natural forest when it comes to CO₂ absorption and increasing biodiversity. In addition to the fact that a food forest can contribute to planetary health, it

also has a social function in many cases. Furthermore, a food forest can increase awareness of our relationship with nature and our food.

So transdisciplinary scientific research, using indigenous knowledge that is present everywhere on Earth, as well as restoring nature, is needed. The final element central to "planetary health" is change. When I started my Ph.D. research 30 years ago, I thought scientists would be listened to. I thought action would be taken if it was demonstrated that there are many risks associated with climate change. I was naive.

In these times when 'influencers,' movie stars, and the media increasingly determine how scientific knowledge should be interpreted, we as scientists also have to assume a different role. Despite the many pitfalls and the resistance of climate sceptics and people suffering from the 'shifting baseline syndrome,' we, as scientists, can no longer hide behind our academic walls. As scientist, we must take a more active social role to bring about the necessary change.

Planetary Health - Transform the System



Scientivist

(Martens, 2012)

Scientivists are scientists that are engaged in a systematic activity to acquire knowledge (the 'science part'), to promote, impede, or direct societal change (the 'activist part')



Picture: Bas van der Schot

Change is also needed in the education we provide. At all levels, most students and teachers are amateurs regarding the climate and biodiversity crisis. Thinking that you, as an educational institution, are done if you embrace or teach some of the 'sustainability goals,' or do something 'circular,' is rather naive. There is a great need for students who can regenerate our Earth and reshape it in every way. For example, education that still embraces classical economic theories has long ceased to suffice. The current economy, with a strong belief in the efficiency of the private sector and the market mechanism, is one of the causes of today's global environmental problems. But also most education on 'circularity' also has serious shortcomings. Here, solutions are mainly sought in technology, in particular, and not in, for example, the social or cultural angle.

So we also need to train students with regenerative education. To restore the health of our planet, we need more systems thinkers and doers. The next generation of students will have to become the re-generation, a generation that combines theory and practise with a long-term vision and integrates different disciplines.

So we need change. But it can be tricky to change certain beliefs or systems. Especially when an individual or organisation feels comfortable with their current way of life and would rather not see any change. Perhaps that is why we should start with wonder. The wonder of how everything around us is connected. The wonder that we are part of the complex web of life and have a role to play.

We can ask ourselves whether biodiversity loss is due to our insufficient protection of nature. The loss of biodiversity may be because we do not contribute enough to the health of our Earth. I sometimes feel that we focus too much on the negative role we, as humans, play in the disruption of our living environment. Of course, we have to solve the various environmental problems. But I also see that we have forgotten our role on Earth.

While some people believe the Earth would be better off without us as a human species, I don't think so. Of course, certain systems we have created are not healthy – such as

I am coming to the end of my inaugural lecture. I hear you think: "Still a lot to do." And that is certainly true. But I am not alone. I am happy to have had the honour of working with many colleagues with whom I have taken the first steps in the field of 'Planetary Health' in recent years.

First of all, my mentors from the very beginning: Koos Vrieze and Jan Rotmans. I remember well that as a young researcher, I stood in the Café Forum between these two professors when I was asked if I wanted to do my Ph.D. at the Mathematics Department at Maastricht University and the RIVM. I have not regretted for a single second that I immediately said yes.

I would also like to thank my international mentors: Tony McMichael, from the London School of Hygiene and Tropical Medicine, and Paul Epstein from Harvard University. Unfortunately, they both have passed, but they showed me how important it is to inspire and advise young researchers who are just starting.

I also especially want to mention all my Ph.D. students who have challenged me to push my scientific boundaries and who continue to do so.

I also thank all my colleagues from the Faculty of Science and Engineering, especially those from the Venlo Campus, where I started almost two years ago. It felt like a warm bath, and even now, it is a pleasant and inspiring working environment. The Campus of Maastricht University in Venlo is ideally suited to further develop inter- and transdisciplinary research and education and to train the next re-generation of students. Thanks also to Thomas Cleij, who gave me the opportunity and the confidence to play a role in this.

The field of 'Planetary Health' is rightly in the spotlight, and I consider myself fortunate to have been able to work with many hundreds of students at Maastricht University and beyond. I will continue to do so with great pleasure in the future.

Of course, the work I do is not separate from the rest of my life, and then it's nice to have a good relationship with your family. The motto of our family group app is: 'Don't worry, no family is normal.' It is very appropriate, and I can only thank my family for that.

Having a group of real friends is also invaluable. So 'Wijntje' and 'Club Crapule de Luxe,' thank you very much for all the parties, dinners, and trips - and many more to follow.

Dad and Mom. Thanks for all the support over the years. Too bad Dad can't be there - I'm sure he would have been very proud.

Furthermore, of course, my children Robin and Timo. At my last inaugural lecture, you were four and two years old. You probably don't remember much from it. Hopefully, this inaugural lecture will stay with you - and not just as the image of your father in some kind of carnival costume. Although you are slowly spreading your wings, our moments together are still a source of joy and happiness.

Dear Aimée. Ever since, I know you, you have been able to inspire me every day, and I hope I inspire you too. Without your good advice, support, and love I probably wouldn't have stood here. Thank you very much for this.

I have said.

Maastricht, 21-04-2023

Pictures, graphs, and other resources have been used with the utmost respect and thanks for the original creators. More information regarding the work underlying this inaugural speech, and the recordings (in Dutch) can be found on www.pimmartens.com.



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