Give room to the Oceans, then the rising sea level can be lowered

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Introduction
Climate measures are based on combating the causes of rising temperatures and helping to slow down rising sea levels. But we do not know to what extent; nor do we know how long it will take. Meanwhile the living environments of 500 million people will be at risk as a result of rising water levels. In order not to wait patiently for this, we propose to give the oceans more space in strategic places on our planet. It seems an incredible story, but calculations show that by digging new seas, the rise in sea level can be reversed.

How can this be done?
In the Netherlands, river floods are prevented by giving them space. In the past ten years, the extensive Room for the River program has been carried out for this purpose. In the same way, it is possible to halt or even reverse the rise in sea level. We are digging holes all over the world. We fill them with ocean water. Scientific calculations that will follow shortly show that it is possible to reverse the rise in sea level in this way.

Do you disagree? Here are the rules
We're in the realm of science. We take a standpoint, supported by an argumentation and the associated figures. Those who disagree with this are invited to refute the correctness of the argumentation and the figures. This is required by law no. 1 of the scientific methodology. Remarks such as 'this is not affordable,' or 'you don't get political support for this' or 'what you say is just not right' are outside the scientific order. Only a refutation of the argumentation and figures – recorded on paper so that all this can be verified – is valid. Saying that you don't have the time or the sense to find out and write it all down gets the answer from law no. 2 of the scientific methodology, saying "Opinions can be proclaimed by anyone, but if you can't write it down, then it doesn't apply".

Questions?
Demonstrating that by giving space to the oceans you can solve the problem of rising sea levels is the only purpose of this article. Of course, there are questions about the feasibility of this. And about the effects, desired and perhaps undesired. We mention these questions, but they cannot be answered. They are in the domain of other scientists. The most important questions will follow soon, with an appeal to other scientific groups to come up with the answers.

Willingness?
All we are asking for now is the willingness to take note of an unexpected solution to the problem of rising sea levels. Without shouting at once that this is unworkable nonsense. The regularly recurring alarm signals about the threats posed by the rise in seawater justify a quiet read about the solubility of this problem – in addition to the unconditional continuation of the climate agreements.

What does the earth have to do with?
We assume that the problem is well known: the emission of CO_2 will lead to a global rise in temperature, causing the polar ice to melt, the sea level to rise and a lot of land to disappear under water. As a result, the lives and livability of millions of people are at risk. As well as the destruction of homes, buildings and infrastructure.

Climate agreements are based on combating the causes of the rise in temperature. That is a good thing. But we do not know whether this will slow down or even stop the melting of the ice. Nor do we know how long it will take before we can expect positive effects from this approach. But we do know that the sea level will rise if we do not succeed in making these two points manageable. We also know that in that case many people will lose their habitat. That is why we are proposing an approach that will completely solve the problem of rising sea levels in the short term: make way for the oceans by opening up deserts to seawater.

We shall now confine ourselves to describing a calculation model for the positive effects of opening one desert as an ocean overflow area: the Sahara. Of course, the size of the required catchment area can be divided among a number of desert areas worldwide. But taking the Sahara as an example makes it easier to understand why such a colossal intervention produces a colossal result.

How does the calculation work?
Strictly speaking, there is only one question: how many cubic meters of desert do we have to dig out in order to stop and even lower the rise in sea level? Because there is still uncertainty about the exact extent of the rise in heat – and it is therefore not known how high the rise in sea level will be – we use figures to show what the consequences are of a rise in temperature of 1.5 to 4 degrees Celsius. With bandwidths for the necessary depths and for the number of people whose livability is endangered. We base the calculation on the report 'Mapping Choices. Carbon, Climate, and Rising Seas. Our Global Legacy' (Climate Central, November 2015).

- If the temperature rises by 1.5 degrees Celsius, the sea level rises by 2.9 meters, with band widths of 1.6 to 4.2 meters. It destroys the habitat of 137 million people, with bandwidths ranging from 51 to 291 million.
- If the temperature rises by 2 degrees, the sea level rises by 4.7 meters, with bandwidths of 3.0 to 6.3 meters. It destroys the habitat of 280 million people, with bandwidths of 130 to 458 million.
- If the temperature rises by 3 degrees, the sea level rises by 6.4 meters, with bandwidths of 4.7 to 8.2 meters. It destroys the habitat of 432 million people, with bandwidths of 255 to 597 million.
- If the temperature rises by 4 degrees, the sea level rises by 8.9 meters, with bandwidths of 6.9 to 10.8 meters. It destroys the habitat of 627 million people, with bandwidths ranging from 470 to 760 million.

The assumption that 4 degrees rise in temperature does not provide a realistic picture of the future is not shared by the scientific community. In some places in the world the rise can even be more than 4 degrees.

How big and deep should the hole be?
We repeat: this is only an example for the digging of one large lake in the Sahara. If we also dig lakes in other deserts, the hole in the Sahara doesn't have to be that big. This is just a question of the size of the total excavation work that needs to be carried out in order to radically solve the problem of rising sea levels.

Well, with a lake the size of 50% of America's surface, the problem has been solved. That covers 4,917,000 km2. Rounded up to the top: 5 million square kilometers.

The other question is: how deep should it be? That depends on the extent to which the earth's temperature rises. With a rise of only 1.5 degrees Celsius, a depth of 200 meters will suffice. But if the temperature unexpectedly rises by 4 degrees, then it must be 800 meters deep.

Digging more or less meters?
As will be the case with other deserts, the Sahara is above sea level. Where the excavation work has to take place, for example, at a height of one hundred meters above sea level, more needs to be excavated than just the depth of 200 to 800 meters. However, there are also deserts that lie below sea level. For example, the Danakil Depression in Ethiopia. It is 125 meters below sea level. This area is also known as the hottest place on earth and as the cradle where the first humans were born. It lies next to the Afar Triangle whose deepest point is no less than 155 meters below sea level.

What are the expected positive side effects?
First the questions about positive side effects. Later on, the questions related to feasibility.

Greening
The salty seawater evaporates and comes down in the form of fresh rainwater. It is known that desert soils preserve seed for centuries. As soon as it starts to rain, it germinates. That makes the desert green again. The effect is greater if one does not choose one large lake but a number of smaller lakes, fed by canals, where at the beginning of each canal provisions can be made to catch plastic. By not opting for one large lake, but a number of smaller ones, fed by canals from the sea, the greening effect is more effective because between the canals and lakes there is land instead of water.

- Which scientific group can answer the question as to whether the thesis on the alleged greening is correct? If so, in which deserts can the effect be greatest, to which extent and at what speed?

Living and working
The greening of deserts provides openings for agriculture and cattle breeding. But also for industries, fishing and research into the minerals that emerge during digging. The excavated desert material can be used to build sea defenses elsewhere in the world where tsunami tidal waves and hurricanes cause flooding. With the construction of villages and the creation of jobs, the outflow of immigrants to Europe can be tempered.

- Which scientific group can answer the question of whether the alleged greening of deserts does indeed create new opportunities for living, working and industry? And whether this will alleviate the problem of migration.

Cooling
The greening of deserts – enhanced by a clever distribution of several lakes and canals – will lower the world temperature. It is a fact that cities in warm areas become cooler as more greenery is created in the city. By giving space to the oceans in hot deserts, the greatest threat – i.e. the rise in temperature – is used to achieve the opposite: to cool down the earth. This is 'making the causer the solver'.

- Which scientific group can answer the question of whether the greening of deserts does indeed provide cooling; if so, how much and at what rate?

Polar ice repair
How big the cooling can be is unknown. We also do not know whether this cooling is sufficient to allow the polar ice to grow again. There are no figures available. We only know that by digging one or more lakes with a total size of 5 million square kilometers and a depth of 200 to 800 meters, not only will the rise in sea level disappear drastically, but perhaps also the temperature rise can stop and perhaps even decrease due to the creation of more greenery, which at the same time increases the absorption capacity of CO_2.

- What scientific group can answer the question of whether cooling due to the greening of deserts can have such an effect that – by increasing the absorption capacity of CO_2 – it can temper the rise in temperature and thus slow down or perhaps even stop the melting of the polar ice?

So far, some questions about expected positive side-effects.

Other deserts
Besides the Sahara, other deserts can be used: the Great Arabian Desert (West Asia, 2,330,000 km2), the Gobi Desert (Asia, 1,300,000 km2), the Kalahari Desert (900,000 km2), the Great Victoria Desert (Australia, 647,000 km2). By spreading the number of lakes and supply channels over other parts of the world, there may be more suitable locations with less impact on climate-related issues such as wind currents.

For the sake of brevity, we are ignoring solutions such as the use of land that could easily absorb seawater, and the use of abandoned mines and underground car parks. The use of existing lakes that are slowly becoming dry – the Aral Lake and some lakes in China and Africa – is also left out of consideration. This article is only about the question: can we, by giving space to the oceans, compensate for the rise in sea level, yes or no? The answer is: yes, we can.

More CO_2 and nitrogen?
The work will have to be done with the use of machines that produce CO_2 and nitrogen. And thus, contribute to global warming and the production of fine particulates. This can be prevented by using solar energy – a new industry – to operate such machines. There is plenty of sunshine in these workplaces.

What are important questions about feasibility and possible negative side-effects?
Now the questions in relation to feasibility. There must also be an answer to possible negative side-effects.

Currents, winds, plants and fish
The effects of such a large-scale opening of one or more deserts on sea currents, trade winds, hurricanes and the regularly recurring phenomenon of El Niño are not yet known. Nor what the effect could be on life under water: the plants and fish.

- Which scientific group can answer the question of whether the implementation of this idea has a negative influence on currents, winds, plants and fish? If so, which ones?

Salinization and groundwater
It is also not known what the effects could be of salinization in the vicinity of the ocean water flowing in. Nor the effect on the groundwater level.

- Which scientific group can answer the question of whether the implementation of this idea has a negative impact on salinization and groundwater? And if so, which ones?

Sand
Another uncertain element is the nature of the sand in, for example, the Sahara. This has been polished around by ancient erosion and collapses as you stack it. Digging canals and lakes is one thing, making sure their walls don't collapse is another. So special shoring facilities will be needed to keep the walls intact. For example, an invention that makes it possible to use Sahara sand in concrete.

- What scientific group can answer the question of whether the implementation of this idea poses particular problems in terms of the excavation and shoring work to be carried out? If so, what are they?

Fresh water
Digging to depths of 200 to 800 meters can lead to underground water reservoirs. We do not know how the salt and fresh water will behave, although it is known that saltwater is heavier and will sink to the bottom. If, however, freshwater reservoirs are actually drilled, this will mean the loss of the required number of cubic meters of desert that will have to be dug away in order to achieve the required decline in the sea.

- What scientific group can answer the question of how to act if freshwater reservoirs are encountered during excavation work?

Property rights and geopolitical tensions
Another uncertain aspect is the question whether countries that own a (part of a) desert are willing to participate in such a project. We also do not know whether the idea of such an operation would raise geopolitical tensions.

- Which scientific group can answer the question of whether the implementation of this idea raises insurmountable legal issues of property rights and perhaps geopolitical tensions? If so, what are they?

Minerals
A question that arises from the previous one has to do with the fact that in the soil of deserts there is not only seed. Also precious minerals. Who can call himself the owner?

- Which scientific group can answer the question of how to deal with the yield of minerals that emerge from excavation work?

Loss of life
We do not know what the effect will be on the lives of people, plants and animals in those deserts if one or more masses of water are created. The preservation of the sometimes centuries-old cultural-historical value of (living in) deserts is to be compared to the value of the life and the quality of life of – possibly – more than 500 million people. Here, governments are faced with the same considerations as in cases where villages have to disappear in favor of the construction of reservoirs to generate electricity.

- Which scientific group can answer the question of whether the implementation of this idea has such a negative impact on the lives of people, plants, animals and cultural-historical values that this idea should be abandoned?

Digging
Even if the excavation work is spread over several deserts, it involves the construction of very large holes. The question that then arises is: who can handle it? Canada has the best miners in the world. They don't shy away from digging huge holes. But, of course, the execution of such work will have to be a matter of cooperation between miners and related professions.

- Which scientific group can answer the question of how the execution of the excavation work should be organized?

Costs
We do not know what such a major operation will cost. It is true that there is the possibility of a global CO_2 tax for companies, but it is not known whether this will go ahead, nor what it could mean for the funding of the provision of space to the sea as described here.

- Who can answer the question of how much such an operation will cost and whether it can be paid for from the proceeds of the CO_2 tax for companies?

Who should be in charge?
Such an operation should be led by the body that implemented the Paris Climate Agreement. In close cooperation with the United Nations and the European Union.
Is this assumption correct? If so, who can arrange this? If not, who should be in charge?

Call for scientific action
We call on scientists working on this subject to provide information on the questions we have raised.

Leo Klinkers – Editor

Leo Klinkers graduated in 1968 from the Faculty of Law at the University of Utrecht in the Netherlands. After a few years working in local government, he became responsible for research and education in public administration at the Law Faculty of Utrecht from 1971 until 1983. He wrote his Ph.D. thesis in 1974 on open access to Government documents.
Between 1971 and 1983 Leo Klinkers developed a method for interactive bottom-up policymaking. This methodology has been published in a number of books and articles and applied in many projects in the Netherlands and abroad.
Since 1983 he has worked as an independent consultant in public administration in several countries, as well as for the EU and the UN. In 2013 he was co-author of the 'European Federalist Papers' with Herbert Tombeur.
He recently finished his last book 'Sovereignty, Security and Solidarity, arguing why and how the present intergovernmental administrating system of the EU should be replaced by a federal system and thus creating The United States of Europe, making America Europe's little brother.
He is actually a co-founder and member of the Promoting Committee of FAEF (Federal Alliance of European Federalists)

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