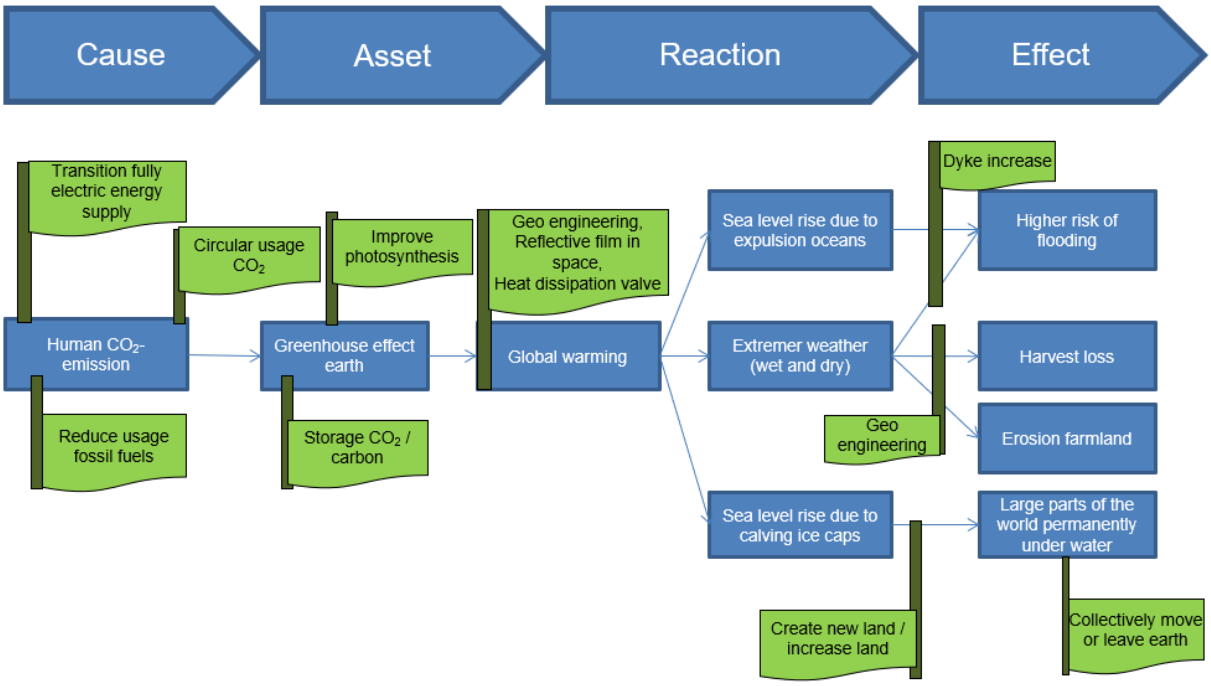
Doing nothing is not an option

P.O. Box 30113
8003 CC Zwolle
the Netherlands
Info@assetresolutions.nl
www.assetresolutions.nl/en

Ype Wijnia and John de Croon *27 April 2018*

In the columns of recent weeks we have analyzed the risk of climate change. The conclusion was that the human contribution to CO_2 in the atmosphere causes global warming. This warming, in turn, creates more extreme weather plus an increase in sea level. In the long term the consequences can be disastrous, for example with a sea level rise of several meters. In the low-lying areas of the world (including the Netherlands) floods occur frequently (or even permanently). Doing nothing is clearly not an option. It therefore does not seem sensible to speculate as in a casino and hope that it will all come along. But which options do we have?

With this question we have now arrived at the next phase in the asset management process, the so-called "program development"[1]. We will use the risk chain that we introduced last week. That was in itself also reuse of earlier material. With our objective of circular columns it seems to be going all right. To summarize it, the risk chain describes the chain from cause to effect. The consequences only occur when the entire chain is completed. The risk can therefore be limited with measures (interventions) that interrupt the chain (in part). Last week, the dyke increase was already positioned and we are adding other mitigation measures (the green flags). We start looking at limiting the consequences (symptom management), on the right side of the chain.



One possibility is to move collectively. For the Netherlands this means moving to beyond Arnhem, for example (to be sure) to Switzerland[2]. However worldwide you talk about roughly half of humanity. That will be a challenge. As far as human bodies are concerned, that may still be possible, because every year something like 70 million people fly from our airport Amsterdam Schiphol alone. The problem is rather in the usable land surface. After all, the coastal areas are flat and fertile (and therefore supply a large part of our food supply), while the higher inland areas can be very unliveable (high mountains, desert). We will also have to do with the earth: we do not yet know a planet in the universe where we

[1] http://www.assetresolutions.nl/en/column/ran-out-of-money....-criteria-for-an-asset-management-process
[2] Whether or not the Swiss will be happy about this is of course very much the question. Before you know it, the tourists say: "Switzerland is a beautiful country, just a shame about all those Dutch people."

could live, let alone that we have the technology to go there with billions of people. It is already difficult to get a few people on another planet. Some even think that the moon is not even feasible[3].

What could be possible is to build a new country. In Dubai, for example, a completely new world has already been created. This will happen automatically in the (very long) term. After all, erosion degrades the mountains and the sediment is deposited on the coast. When we want to relocate 3 billion people with say 200 people per square kilometer, we need 15.000.000 km^2. You have to transfer roughly 1 million cubic kilometers of material for this with 60 meters of elevation, which corresponds to 2 million billion tons. Every year, ships transport around 10 billion tonnes worldwide[4], but that may still be increased. This operation therefore takes 100.000 years, if you are a bit optimistic. Then you can probably better wait for the next ice age.

Our preliminary conclusion is therefore that we are not going to make it with measures at the end of the chain. We will have to intervene earlier in the chain. Now geo-engineering makes it possible to come up with possibilities to directly intervene on warming-up. Perhaps you can reduce the solar radiation by means of a large reflective piece of foil in space, or you can create a heat relief valve in the direction of space. But we have always learned that prevention is better than cure[5]. We will therefore have to move even further to (green) left *(note: green left means Groen Links in the Netherlands, a green left wing political party)*.

We will elaborate into this in the coming columns. We start with the most basic, through the prevention of CO_2 emissions. In fact, that comes down to limiting the amount of carbon that we retrieve out of the soil[6]. For the energy supply, this should be possible with the transition to fully electrical, since the sun emits 10.000 times more than humanity uses. But carbon is used in many more products, such as plastics, paper, clothing, food and so on. And certain forms of transport (e.g. flying) are awfully difficult on electricity. In order to prevent an increase in the amount of CO_2 in the atmosphere, you can significantly reduce the use of these products, but that means a significant loss in terms of prosperity, well-being and comfort. What is also possible is to make the carbon we need circular, so that CO_2 has to be captured from the air. Plants do this on their own, but it can also be done artificially. And through plant breeding, it might be possible to strongly increase the CO_2 inclusion[7].

With the prevention of new emissions (as must be achieved in 2050) the problem has not yet been resolved. Global warming is impinging heavily on the CO_2 concentration. In order to limit the warming to acceptable proportions, it may be necessary to become more than circular and to put carbon back into the ground. You can think of direct CO_2 storage (with all the related discussion) but also of recording in minerals (olivine) or even reverse mining (CO_2 plus hydrogen from electrolysis by means of Fischer Trops[8] to petroleum or natural gas and then pump it in the soil). Maybe you beat two birds with one stone. With the refilling of the gas bubble in Groningen (the Netherlands), the ground will rise again and we will be able to fight the sea level rise. With a bit of luck, the earthquake damage from the past is automatically restored. Or would that be just as shocking for Groningen as the deflation?

John de Croon and Ype Wijnia are partner at AssetResolutions BV, a company they co-founded. They give their vision on an aspect of asset management in columns. The columns are published on the website of AssetResolutions, www.assetresolutions.nl/en/column

[3] http://www.assetresolutions.nl/en/column/whoever-reads-this-is-crazy
[4] https://nl.wikipedia.org/wiki/Koopvaardij
[5] With the exception of natural Dutch Courage for which a glass of buttermilk is the right medicine, we would not like to miss it
[6] The isotope study of the CO_2 in the atmosphere shows that the increase is really fossil carbon
[7] https://www.volkskrant.nl/kijkverder/2018/voedselzaak/ideeen/het-antwoord-op-het-voedselvraagstuk-is-veel-sterkere-fotosynthese/
[8] https://nl.wikipedia.org/wiki/Fischer-Tropschbrandstoffen