Catalysts

Good ideas need action to really bring about change. Actions are within people, who put ideas into practice and get energised or inspired by them. People who are not easily discouraged, who keep the higher purpose in mind, even when the roads of reality get bumpy. In other words, Catalysts. Ideas carried by people, people carried by ideas. That's why we use Catalysts as a term both for the ideas and for the people who want to run with them.

In what follows, we describe the Catalysts prepped by the participants in the arena. But when did we consider something to be a catalyst? Well, first of all the idea needed to have originated from the thought process around the guiding ideas, or had to have been viewed from a new perspective through the guiding idea. The idea or project that was earmarked as a catalyst focuses on systemic challenges, and aims at changes that are systemic in nature. And thirdly, an idea became a catalyst when the arena was fired up by the idea or project discussed, in other words, when catalysts rose who wanted to start running with it.

The Catalysts are not finished yet. They still need in-depth practical and brainstorming work to become sharper, to get everyone in the picture and / or on board to prepare them as a project, or to realize them as a project. Our start-up network of Waterpreneurs got behind the project and calculated the value of the Catalysts. In terms of euro/impact on water, or impact on society/impact on water capital, or impact on landscape/impact on water capital, impact on water managers/impact on water capital, impact on nature/impact on water capital. But also impact on broadening and enriching the space for thinking about water, the potential of water users to connect different perspectives. As such, the catalysts form the innovation space for the Waterpreneurs, with the aim of a growing and flourishing water capital.

DISCLAIMER

The Flemish Environment Agency, De Vlaamse Waterweg, De Watergroep, Aquafin and VITO - Vlakwa have created the opportunity to give leeway to a group of cutting-edge thinkers to develop a systemic view of water, and to challenge the watersector to shape a futureproof water system. The formulated ideas are not those of the initiators, nor do they represent their points of view. They are however considered valuable as an inspiration for the future water system.

(De Weerdt, Y. & Halet, D. (Red.), 2021)

H2050 TRANSITION ARENA WATER

THE BOTTLE FILLERS. A NEW LOOK AT THE DRINKING WATER CHAIN.

"'Domestically sourced water' represents unquestionable quality, with an identity.

Watermark revisited
Tap water producers and bottled water producers share the same goal: to bring pleasant-tasting and affordable drinking water to the public. Their model varies, but their raw material, water, turns out to be finite. So it is not certain whether both models can continue to co-exist, without putting pressure on each other. Pressure that is already being felt. Sometimes resulting, for instance, in unclear and contradictory information for consumers and a decline in the image of tap water. This image is part of what we call the 'symbolic capital' of water. For example, drinking water is strongly associated with a healthy lifestyle. Taking water to work doesn't necessarily mean you are healthy, yet you can earn some kudos by associating yourself with it. In the same way an expensive car is supposed to convey success. That is symbolic capital, and we find elements of it in the image of water.

The positioning of drinking water producers is very strongly based on that image. Some bottled water producers will claim that their water is not chemically treated, with the underlying message that chemically treated water is not really ideal. Tap water producers will claim that tap water undergoes more tests than bottled water. This battle for image risks undermining consumer confidence. Experts reassure us that tap water or treated waste water is perfectly safe. However, these days the public in Flanders has significant reservations.

Up until now, the question of drinking water has been very straightforward. You either chose bottled water from a natural source, or you drank water from the tap. The classic image in the minds of many consumers. The development of technology for decentralised water production, the growing awareness of micro-plastics, the growing range of applications 'for the tap' (auxiliary filters or built-in filters, rapid cooking systems, etc.), these are all evolutions that gradually hollow out and broaden the simple dichotomy between tap water and bottled water.

What's more, bottled water producers are already being confronted with water scarcity, and they too are forced to admit that they are not the only ones with claims on the water supply. For example, The Daily Telegraph reported in 2018 that there was already a conflict between the city council of Vittel and the company of the same name, when the city faced water shortages and accused the company of overexploiting water resources[1]. All these increasing 'pressures' from different sides seem to be redrawing the landscape of drinking water production and sales, which will be a difficult issue without consumer confidence.

1. https://www.telegraph.co.uk/news/2018/04/26/french-town-vittel-suffering-water-shortages-nestle-accused/

Moreover, beneath the battle for image there is another layer of deeper and therefore more systemic causes. For example, the reason that tap water is rigorously tested is because of the higher vulnerability of tap water compared to bottled water. Protecting the drinking water network against pollution is one of the biggest challenges for tap water companies. A challenge that will continue to grow in the future, when alternative water sources will have to be used for our (drinking) water supply.

People are therefore thinking about how water consumption can be scaled back, but also about how we can reuse water. In addition, there are various reflections on an alternative 'parcelling' of the water supply chain, with one possible option being a water network that does not supply drinking water quality, but water that is then upgraded at the end of the supply chain. A good example of this is DC Water and Bosaq, who offer personalised water services that are offered to the customer 'after the meter' such as smart leak detection, variably controlled water demand, personalised flavouring, additives, etc. A tap water supplier who 'retreats' a little could therefore create space for innovation and entrepreneurship. But that raises new questions about inclusiveness, affordability, ethical issues, and so on. Exploring these kinds of avenues in co-creation can create powerful openings to examine bottled water production, tap water and circular production and end chain in a synergistic and future-proof context. Implementing a reflection exercise based on a customer journey could bring clarity in this regard.

Who will set up a Customer Journey to map out the complete process between consumer and product? This relates to both direct contacts between the consumer and the water company as well as indirect contacts, such as opinions of others via social media, blogs and reviews. As such, we provide insight into the customer experience, in order to improve the image of drinking water. We redesign value chains based on these insights, and look for opportunities to bring together value models, technology and image enhancement into a model that strengthens Flemish Water Capital.

H2O 50 TRANSITION ARENA WATER

FLANDERS IS EVAPORATING, EARTHWORMS TO THE RESCUE?

Local authorities in Flanders are encouraged to draw up rainwater plans. These plans need to present a detailed vision of how they intend to use rainwater as an alternative water source, to capture it and allow it to infiltrate the source, store it in buffer zones and/or slow down its drainage rate. The need to switch from rapid drainage to capture is widely acknowledged. In practice, the needed switch is happening (too) slow. Besides the fact that only a limited number (10%) of municipalities have a rainwater plan, these plans still strongly put the emphasis on water drainage.

One phenomenon, which will delight Scrabble fans, remains out of the picture for the time being: evapotranspiration. You could describe it as the sweating of the soil and plants. And this evaporation process plays a more important role in the system than many people suspect or realise.

Approximately half of the water available every year in Flanders comes from rainwater (the other half is water flowing into Flanders via rivers). And here's the thing: 70% of the water that falls on our territory evaporates! Around 25% penetrates into the soil, and 5% drains away (through watercourses and sewers). Furthermore, climate scenarios suggest that in future summer periods, more water will evaporate on the surface and from the soil than will fall as rain. And the disparity is only going to expand, because summer rainfall will decrease and evaporation will increase.

Evaporation in itself is not necessarily a problem. But due to the extent of it, it at least merits an exploratory question at a time when it is becoming increasingly difficult to meet our water needs.

Evaporation is determined by various factors. For instance, the type of greenery and vegetation, and their specific growth stage; the types of soil cover for paved surfaces, humidity and solar radiation, and temperature and wind. Each of these factors could be an answer in bringing down evaporation losses.

Is evaporation significant then, one might ask? To give an idea of the order of magnitude: the water we use in Flanders is 10% of what evaporates. So there is considerable potential here to make our water management more robust. This doesn't have to be complicated or expensive. Natural windbreaks can help for example, such as hedges or rows of trees, because less wind means less evaporation. Porous road surfaces help by creating a cooling effect. When trees, plants and crops are planted, the evaporation characteristics could be examined in more detail (the popular poplars, for example, sweat away a significant amount of water compared to other trees). Applying soil improvers that store water in the soil faster and more effectively, thereby slowing down evaporation, could also help. But wildlife can also offer a solution: earthworms help the soil to capture and hold water. Taking care of the earthworm population could then help in this regard.

1. Evapotranspiration is the amount of water vapour in millimetres that dissipates into the atmosphere.
It is the sum of evaporation from the earth's surface and transpiration from crops.
2. https://www.vmm.be/water/droogte/impact-droogte-op-grondwater
3. https://klimaat.vmm.be/nl/web/guest/klimaatverandering-in-detail

Evaporation is therefore a significant element in our water management, and it can be tamed by simple measures. Tamed, because we don't want evaporation to stop completely. Evaporation provides humidity and cooling, and we need that to make life comfortable. It creates clouds, which in turn offer shade, or retain heat at night, and so on. That is why it is especially important to look at where slowing down evaporation can also provide other added value. Trees instead of a lawn in the garden inhibit evaporation, and enhance biodiversity simultaneously. Greenery in a city cools it down, thereby taming the evaporation of paved surfaces, but at the same time contributing to well-being and liveability, and water buffering.

Although evaporation has long been an issue in warm, desert-like areas, it seems to have stayed under the radar in Flanders. This could be due to various aspects of the water policy as identified in the arena process. First of all, calamities in the water system, floods, serious damage to water quality, and major water shortages turned out to be strong drivers for policy agendas. And evaporation does not cause disasters. Nor does it have any impact on infrastructure, or cause any visible damage. The instinct to control and manage, often using infrastructure, which would characterise water policy in many areas, is not applicable to the problem of evaporation. It requires a more proactive and integrated vision of the water system, which results in ideas for effective management of earthworm populations instead of concrete sewer pipes with a diameter that can be calculated. You could say it is a matter of having a different mindset, and for that very reason it is interesting and relevant to explore further.

We want to gain better insight into the issue of evaporation, and by experimentation, build a better understanding of the potential of evaporation as a solution.

WHAT IF WE ONLY USE DRINKING WATER FOR DRINKING?

What if we only use drinking water for drinking? It seems trivial. Even though it is estimated that only 30% of total water consumption requires water of drinking water quality. Nevertheless, a few years ago the group of civil servants and designers involved in developing the Paterssite in Sint-Niklaas were unable to come up with an answer straightaway. The question emerged along with the idea of using the large roof of the chapel on the site to collect water for the rest of the site, which would include several dozen houses, built around the old square garden of a former monastery. "You'll never be able to meet the water demand of all those homes with that?", someone pointed out. Someone else asked what exactly the demand was. Around 120 litres per person per day was the design guideline, was the reply. And that is basically all drinking water from the water mains? Yes. But it's not only for drinking water, apparently. After all, we also flush the toilet with drinking water. We water the plants or the lawn with it. We fill the swimming pool with it. We use it to wash the car. And ourselves. We cook vegetables in it, or make coffee with it. Pretty much without restriction. It is estimated that 1 litre out of 120 is actually drunk. If we include the water for preparing food, we end up with just 5 litres of the highest quality drinking water that we actually need. So, what if we just used drinking water for drinking? Instead of using the status quo, which will exert ever more pressure on our water supply, as the benchmark for new approaches, whereby unsustainable practices are set in stone for decades to come, take the preferred situation as a starting point for the design. We would explore that idea.

Where do you start? The idea prompted a lot of questions. The first wave of questions in this regard is how the various needs that drinking water from the tap currently meets can be met without drinking water. We introduced the idea of 'reverse leapfrogging'. We generally assume that with our insights and technology we can help developing countries avoid the mistakes that we ourselves have made, so that those countries can 'leapfrog' straight to sustainability. The opposite concept, whereby we can learn a lot from them, is less familiar. And yet from a systems perspective there is a strong case for reverse leapfrogging, learning about solutions that need to work in a context of scarcity. Because, as we just illustrated, our systems were designed in a context of abundance. 120 litres of drinking water-quality tap water per day, per person, no questions asked, without flinching. Anyone who has ever visited India knows that you wouldn't dare to reveal that fact over there.

That brought us onto a project in India in which we were involved. At the time, the project was just looking at the possibility of generating energy by fermenting the contents of dry toilets, for the kitchen of a local school where disadvantaged children received schooling. That's right, dry toilets. In a context of scarcity, with no water, let alone drinkable water, people design dry toilets. European technology developers also design them. But you can hardly find them here in Europe, although we are starting to slowly see them appear, especially in the form of urinals. By a rough estimate, dry toilets could help achieve significant savings: about 20 litres per person per day, which is roughly one sixth of the consumption figure at the time. Take 50 houses with an average of 2 people (a conservative estimate). Then we save 100 x 20 = 2000 litres per day, so 14,000 litres per week or 728,000 litres per year. That simple calculation made an impression. Various figures are bandied about that deviate from this figure to some extent, but the aim was not to make an accurate calculation, but to see that playing around with assumptions is a powerful way to create new room for solutions.

The group was enthusiastic about seeing how far the idea could go. We discovered a second avenue to find alternative ways of meeting the needs: to get ideas, not only can you explore space, but also time. In the meantime, the idea of restricting the demand for water had become associated with the monastic life that had once taken place on the site. At that time, frugality was an important virtue. Not because of the limitation, but because of the freedom and comfort that came from that limitation, someone explained enthusiastically. They went on to highlight the importance of collectivity and connection with the surrounding community, which the monks had considered very important. Frugality as a comfort combined with the connection with the environment was updated under the idea of organising a laundry bar for the future residents of the site. In the neighbourhood next to the Paterssite, there was a laundromat that had been struggling for some time to attract customers. The idea emerged to invest via the project development in an ecological overhaul of the washing machines in the laundromat, in exchange for a laundry service for the residents. The new washing machines immediately reduced the impact of all the washing done by the other customers. The positive corollary effect of this idea emerged some time later. If the residents received a laundry service included in the purchase of their home, then a laundry room was no longer necessary, nor was the door to the laundry room, which also took up space. As a result, social housing could be built at a lower cost, without sacrificing living space. This drew our attention to a third, sometimes overlapping and sometimes complementary avenue for alternative solutions: multiple value creation.

Laws can prevent dreams from becoming reality, as can practical objections... The final project was unable to realise this vibrant creativity at this level of ambition, but the idea is still incorporated in the site's master plan[1]. Nevertheless, in recent years, the idea has only become more relevant, and therefore merits much more thorough scrutiny. This brings us to a second set of questions: what is needed to realise these new solutions? You can find out by starting with the core idea, and then build the network around it, as it were, to make it work. For dry toilets, the toilets themselves of course, but also other ways of keeping them clean (no substances that affect the fermentation) and using the toilets, namely for men - in more abstract terms, different user practices. And if water is no longer used, does everything get adequately flushed into the sewers, or do these have to be modified as well? - in more abstract terms: different infrastructure. For our second example, the question is how the sketched revenue model can be translated into rules for the interactions between, and money flows between, all those involved, which take account of, for example, tax and mortgage lenders' rules - in more abstract terms, different institutional or policy arrangements.

That brings us back to the laws and practical objections that stand in the way. If you know how to deal with them, they can become your allies. This is possible if you consciously use them to identify which new practices, infrastructure and arrangements are necessary.

We therefore invite Waterpreneurs to get started at the point of departure, at different levels of scale: at the level of a single home, at the level of an urban development or urban district, and possibly at the level of a stretch of riverbank covering the border between Belgium and the Netherlands, in order to investigate whether the reversal of the design logic might not even affect the water level in the Meuse. But the link with the energy transition is also relevant in this regard, because at a time when there are increasing calls for a major energy renovation wave of existing assets, the link to water infrastructure ought to be part of this.

1. https://interwaas.be/sites/interwaas.be/files/pat_160413_masterplan.compressed_0.pdf

THE WATER CAMPUS

"Water, in all its forms, is what carries the knowledge of life throughout the universe."

- Anthony T. Hincks

Network of multidisciplinary thinkers and doers
Our world has long been characterised by the gravitation towards specialisation in certain areas. Water is no exception. As a result, disciplines that were naturally connected to each other were separated in intellectual terms. Specialism resulted in a fragmentation of knowledge and actions.

Specialisation did, however, provide much and deeper knowledge of the disciplines and was well able to provide effective support and orientation in the envisaged water management. Nonetheless, the problems and challenges now arising from climate change and new economic realities require more than specialist knowledge. It is becoming increasingly clear that the disciplines are an inseparable part of a larger system. This means that solutions to the challenges need to be approached from the perspective of multiple disciplines, in order to optimise the synergy effects. In other words: a systemic way of thinking and acting is essential to arrive at new insights and solutions. This offers an opportunity to restructure the existing specialisms, complement them with new areas of knowledge, and prepare them for systemic water management for the 21st century.

Network of multidisciplinary thinkers and doers
Water is the basis of our existence here on earth, and it is therefore logical that we see it almost everywhere in our society. In our food supply and food processing, in the built environment, in transport, in the recreational sector, energy, etc. The knowledge and insights we have about water are brought together in a central place, physical or otherwise. This allows the various disciplines to learn from each other, develop crossovers, etc. Apart from enriching and sharing knowledge, we can also consider and give room to the switch from conceptual thinking to formative thinking. In other words: how do we translate the knowledge from thinking to doing? The platform/campus will also initiate practical translations of knowledge and ideas - so that changes, improvements and innovations can actually take place.

Exploring what a water campus looks like.
If a central water site can help better identify and address water challenges, what would it look like? Is it a physical campus? A digital platform? Or is it a combination of both? What do we need to do, and what not? What parties (organisations and people) should/could be part of this? What would it cost to set up and maintain such a site?

Can we draw up a project business plan to set up a network of interdisciplinary and transdisciplinary thinking on water, and what parties and resources do we need to assess this?

(WATER) EDUCATION

"They both listened silently to the water, which to them was not just water, but the voice of life, the voice of Being, the voice of perpetual Becoming."

- Hermann Hesse

From knowledge, through competencies, to wisdom
The educational system as we know it is primarily based on the transfer of knowledge to the student, thereby increasing the latter's capacity. Knowledge is often seen as essential for the development of an individual, so they can function effectively in society. Knowledge is power, and with sufficient knowledge, a person can contribute to the (economic) prosperity of society. Society has become increasingly complex in recent decades. And although the education system has tried to adapt along with it, it has fallen behind. The speed of change in society has been simply too high to allow the necessary adaptation/renewal in education to occur. Both the way we learn and what we learn will have to take a new form.

Embracing complexity (thinking)
The recent new vision of the HOGent (Een leven lang leren en laten leren, 2020) stated (translation):

"Moreover, we can now see the extent to which everything is interlinked in the social and economic system that has developed over the last 30 years, since the end of the 'short 20th century' in 1989. A bat in China can paralyse entire sectors (tourism, aviation) in a matter of weeks, unleashing global disruption like nothing ever seen before.

An adaptation of the way in which global logistic chains have become organised is inevitable. The far-reaching specialisation and 'single sourcing', and the associated short-sightedness, caused by 'gains' (in terms of efficiency, costs, standardisation, etc.) in the short term, will have to be replaced by systems thinking and a holistic approach, in which people will once again occupy a much more central position.

All these challenges will require a different mindset on the part of everyone in society. We will have to become more flexible in our thinking and actions. We will have to think more out-of-the-box. We will have to invent new systems and technologies, and combine existing ones in a different way."

The recommendations of the recovery committee also emphasise competencies such as systems thinking. The experts in the economic recovery committee put it as follows (translation):

"Finally, commitment to a sustainable economy also requires the development of sustainability competencies. These are not only technical in nature, but also include aspects such as systems thinking, long-term thinking, being able to solve complex problems, and stakeholder management. Innovations in education, e.g. by focusing on sustainability projects, are necessary to develop these competencies in future generations from the early beginning of their school careers".

As such, systems and complexity thinking is seen from different angles as an important lens to understand the world. To this end, it is also advisable not only to take the regular Western scientific philosophy as the basis, but also to incorporate Eastern scientific philosophy. Whereas Western philosophy is based on reductionist principles, the starting point of Eastern philosophy is that of the whole. A symbiosis of these two scientific philosophies could be a good basis for scrutinising and understanding the world in which we live, where everything is connected to everyone. As a result, the capacity of people and organisations to act and educate fits in better with the developments of our time. To achieve this, starting from the educational system makes more than sense.

From compulsory education to compulsory development (to paraphrase Eva Vesseur)
Knowledge alone is not enough to meet the challenges of our complex society. As a result, we are seeing trends that increasingly focus on competencies. Not just in education, but also among employers. These employers also see that their organisation has to operate in a complex world. Not only does this require knowledge, but also creativity, collaboration, systems thinking, problem solving thinking and critical thinking, digital and communicative competencies, and so on. But also the ability for self-development, self-expression and self-guidance.

Who can and wants to take the initiative to create a space within their organisation in which they can try and learn with a systems-oriented approach, or would support a training course designed for this purpose and encourage the active participation of employees and colleagues?

WATERBALL. A REGIONAL WATER METABOLISM THAT CONNECTS IN ADDED VALUE.

A philosophical project, as Bernard Haspeslagh called it. Because the classic economic paradigms cannot contain the total added value of their project on buffers and agricultural methods, for businesses, people, the environment and nature, and the cost-benefit ratio in the narrow sense can therefore not work. A number of added values are not yet visible either, or have not been made visible. Ranging from a rather conventional question about reducing the cost of water purification, to the welfare of the farmers involved, who may have to contend with a little less uncertainty because of the buffer that was created by Ardo: this will become increasingly important in the coming decades, when climate change will cause more and more frequent droughts as well as extreme rainfall. Or perhaps social cohesion and solidarity will be enhanced, now that a group of farmers has been brought together in a cooperative. Ideally, the cooperative can be arranged in such a way that each participant benefits from frugality and purity in their interactions with water. And isn't biodiversity improving in the region, now that potentially harmful substances are not being used as much to grow vegetables for Ardo?

As such, we are proposing a project that aims to investigate how the regional water metabolism, of which Ardo is part, distributes, connects and can strengthen social (added) value, and thus lead to greater regional water capital. In other words, it is a quest for the nature and design of multiple value creation around Ardo.

We are looking into how we can visualise (or map out) the different values that are connected and made possible through the metabolism. We have chosen the buffer as the core, and try to make the water flows around it visible, and see how value flows (can) relate to this. We examine which practical aspects are necessary, and which infrastructure and institutional arrangements.

To start with, regarding the buffer itself: how big does it need to be ideally, to use too much water in some parts of the year, and during droughts at other times?   Which laws and practical objections stand in the way in this regard, and what infrastructure and/or institutional elements can provide a solution? For example: what infrastructure is necessary to make it (cost) effective for users? Which rules follow from the earnings model, which rules can promote frugality and purity? In what (cooperative) institutional arrangement can they be brought together?

The next series of questions concerns corollary elements. What changes in farming practices are needed to enhance frugality and purity there? Which laws and practical objections stand in the way in this regard, and what infrastructure and/or institutional elements can provide a solution? The same questions can be asked for Ardo itself, and for other possible participants in the system. The answers to the questions about the buffer and the corollary elements together can paint a picture of what a coherent and feasible regional water metabolism might look like, and what is needed to make it work.

We look at the ins and outs, those which can be manipulated (drinking water consumption, pumps and locks, e.g.) and those which can't (rainfall) on different scales (building, district, city, region). We examine the maximum volume of water we can hold, and what the effect would be for regional actors, landscapes and activities. And get an idea of the possibilities of more extensive reuse.

The driver for the research and learning process is action. Understanding the water metabolism and identifying the key questions is done alongside activities in the water metabolism. Looking how the system responds in this respect, and from there developing new approaches, and making the impact increasingly visible, thereby developing an ever stronger basis for system innovation practices, that is the goal.

Who is investing in this inter(active) network, or Water metabolism? In making systemic changes visible under the influence of new partnerships, value networks and technology-society interfaces in the area of integrated water approaches (hydrology, governance, business models, health, etc.), in the Ardooie region. We are looking for investors who are fans of Moneyball, a film in which a young economist makes a difference in scouting for new talent for a team by revealing values of these players that were previously unidentified.

WATER IS WHAT THERE IS.

"Water is the most extraordinary substance. Practically all its properties are anomalous, which enabled life to use it as building material for its machinery. Life is water dancing to the tune of solids."

- Albert Szent-Gyorgyi

Water carriers in motion - about the 4th type of properties of water
In modern society, but also long before, water was primarily studied from the perspective of what we call the first 3 properties of water. These are the physical properties, such as electrical conductivity, colour, transparency and temperature. Then come its chemical properties, which are mainly determined by substances present in the water. And thirdly, the biological properties of bacteria, algae, water fleas, macrofauna, plants and fish present. An impressive amount of research has already been conducted into these properties. And despite the fact that, as a result, we know that the properties of water are often unique, we still do not know much about this substance that is essential for life on earth.

Of all known fluids, wrote chemist Felix Franks, 'water is probably the most studied and least understood'. There is an excellent liquid theory that can explain how liquids will behave surprisingly accurately. But if you want to understand water, this theory is of very limited use. Every time you drop an ice cube in a drink, the strangeness of water is clear to see. You see a solid substance floating on its liquid form. When other liquids cool down and become solid, they shrink. That is not the case for ice, it floats because it does something odd when it freezes. It expands. At the basis of this property lies the polar character of water molecules that allow hydrogen bonds to form, thereby creating vast three-dimensional networks of water. These networks are not static, rather the connections between them are broken and re-created in a trillionth of a second.

These weak connections and their ability to bond and separate quickly are (i) at the basis of many important biological processes that take place within cells, (ii) why water is liquid at the prevailing temperature and pressure on earth, but (iii) also why ice has a lower density than water. Another water anomaly is, for example, the Mpemba effect. This is the phenomenon where hot water freezes faster than cold water in certain circumstances. There has as yet been no definitive explanation of why the Mpemba effect occurs. To date, a list of more than 70 water anomalies has been identified.

The more research we do into water, the stranger it becomes and the more questions it raises: "Is there information hidden in these intrinsic properties of water, or can we add information to water? Regular water management still focuses to a very large extent on the standardisation of the first 3 properties of water. For the time being, there is only a limited focus on the intrinsic properties of water, which we refer to as the 4th property here.

In recent years, however, the trend has been ever growing interest in the more unique properties of water. Not In the least because we see that for the challenges we face when it comes to our water systems, the standard knowledge and methods no longer appear sufficient.

We are setting up this project as a plug-in to research sewage water as a 'mirror' for the COVID crisis. We are broadening the 'measurements' in the project from a perspective of deeper reflection on the 4th property of water. Where possible, we are connecting the reflection with tangible traces that help interpret the integration of the 4 properties of water, and the development of a more holistic view on water. Can we imitate natural water flows to revitalise sewage water or stored water for irrigation? Can we also give water 'information', or just extract information from water?

As such, we intend to create a 'flow' via the plug-in: How and where and with whom can we find and interpret the knowledge that is there? What can we do with it? In other words: can we identify the most important and unique properties of water and investigate how these can be used in diverse fields where water is active and essential?

H2050 TRANSITION ARENA WATER

THE POWER OF A HERD OF WATER BUFFERS

Thinking small doesn't rule out thinking big.

Today there are an estimated one and a half million private rainwater cisterns in Flanders, meaning that Flanders has the highest average density of rainwater cisterns in Europe and possibly even the world. Today, these wells account for a total storage capacity of at least 10 million m^3. As rainwater cisterns are now obligatory in new constructions and for large-scale renovations, this capacity will only increase in the future. These cisterns are currently still stuck in the rationale of self-sufficiency at the household level: the cistern is intended to meet the water demand of the family, and to reduce consumption of drinkable tap water. However, a number of trends call for cisterns to be installed for different rationales, with new technology making it possible to explore collective rationales as well. But first: which trends can shed new light on the possible functions of our high rainwater cistern density.

There is the increasing intensity of rain showers, which requires a lot of holding capacity. There are persistent droughts, which put pressure on the water supply. There are trends in self-sufficient living and, under the influence of the corona crisis, much more homeworking. As a result, household water consumption appears to be increasing, which also causes rainwater cisterns to run out quicker. With the increasing realisation that water is not as infinite as we would like to think, it is a good idea to invest more in the smart design of the collective or at least coordinated management of our private rainwater cisterns. In addition, we can't forget that rainwater is the result of a natural distillation process (i.e. a free purification process / free service from nature) and it would be a shame if, wherever rain falls back down to earth, we didn't make use of it. Definitely if this goes hand in hand with further improvements in air quality. This happened during the lockdown, when significantly less dust was carried by raindrops through the air when they fell.

The main question is how we can make this abundance of small rainwater cisterns work together, based on a number of simple rules, so that we can spread out our demand for various sources of water (rainwater, ground water, surface water, drinking water, grey water, etc.) more widely in time and space.

In this context, navigation platforms such as Waze, Google Maps, etc. can provide inspiration. Detailed road maps are loaded onto these platforms, but their strength lies in the data provided by the large amount of users. If one car driver uses these platforms, it just functions as a regular GPS, suggesting a standard route with estimated time of arrival. The more drivers use the platform, the more functionalities suddenly pop up: e.g. congestion in certain roads and the decision rule to propose an alternative route.

Similarly, you can set up a platform for private rainwater cisterns, to which a simple digital pluviometer and altitude gauge can be connected. If only one cistern is connected to the platform, it will give you information about how much rain has fallen and how many litres are in your cistern. However, if you ramp this up to 100,000 and spread more rainwater cisterns over Flanders, we suddenly get insight into the actual rainfall, which cisterns are empty, the available buffer capacity, etc., distributed over time and space. And tailored actions can be proposed for your cistern: letting rainwater infiltrate, draining it into the sewers, using it for drinking water, injecting it into the drinking water network, draining it from the sewerage network, etc. Whereby the general basic rule for the water level in your cistern would be "Stay below the overflow level" and "Do not touch the soil", by looking at the rainwater cisterns in the area.

The challenge for our water system is not to work out complex hierarchical and decision-making structures, but to define a number of simple control rules that we can all work with together.

We are experimenting in the **first phase** with a new governance: direct communication between the government and the citizen: e.g. the citizen is encouraged via SMS to perform an action (to ensure that the buffer capacity of the rainwater cistern is maximised) and remain in control of an app in which citizens can consult each other's water supply and exchange water between neighbours. We anticipate a wave of technological innovation: smart rainwater drainpipes that allow the water to run off into the ground or to the rainwater cistern in relation to the water level in the cistern. Gauge measurements, to partially empty the cistern, connected to the installation for using rainwater. The existing pump and telecommunication can then be used for both using rainwater and diverting rainwater to sewers at times when heavy rainfall is expected. New communication protocols. The crisis cells (Flemish, provincial and local) will also have to adapt their operations to this new way of thinking and working. In the **second phase**, we will go a step further. How can we make use of each other's knowledge? Not only can the platform be filled with one and a half million private rainwater cisterns, but also with at least as many people with local knowledge about the water system, the weather and local needs.

Who will turn the rainwater cistern project into a true commons story? Who will help look for systems and platforms to jointly manage all rainwater cisterns - and, by extension, all minor buffer capacities? Who will help test how neighbours and local residents can use each other's water or how farmers can use private cisterns and vice versa? What governance, technology, price calculations and payment models, and backup systems, are needed in this regard?

OPPORTUNITIES TO CONNECT AND NEW VALUE CHAINS

"If you do not understand your role in the problem, it is difficult to be part of the solution"

- David Peter Stroh

Although long-term thinking is often seen as an obstacle to decisive action in the short term, long-term perspectives often offer openings for more fundamental rethinking in the light of complex and, in this case, very costly challenges. For example, short-term thinking about solutions will often get stuck in the immobility of the depreciation period of infrastructure. Since, especially in economic terms, you are bound to the choices that are at the base of that infrastructure. As long as it is not depreciated, there is a tendency to take that infrastructure as a framework for reflection. For example, water treatment plants reflect an assumption that you only tackle pollution at the end of the chain, and make the costs of this treatment equitable, for example through taxes or levies. The model in Denmark, on the other hand, is based on the idea that intervening at source can drastically reduce the need and costs of water treatment, while at the same time achieving a better match between responsibility and cost-sharing (the polluter pays).

But what if you shift the perspective beyond investment cycles, or fit your planned investments into other solution frameworks? What if you put the money for the planned renewal of a new sewerage system into a design exercise as an investment budget for a decentralised water management system, so that the sewerage system becomes superfluous? What if a subsidy for circular shower systems would support the energy transition, because people need a less expensive heat pump and a smaller hot water storage tank, thereby making the complete sustainability of their homes more feasible? In other words: what if you combine objectives and share the means to achieve them?

There are so many gains to be made when you can see the connections between different dynamics and transitions, and get to grips with how, on the new playing field that is then created, there are many opportunities to combine challenges, so that the common solution becomes more feasible than separate solutions for the individual challenges, which in themselves often flounder because there is no business or value model. But that takes practice. And experiment. Here are some possible ways to encourage opportunities for practice and experiment.

Drawing up competitions for creative solutions to systemic issues, such as:

- How do we detach an increase in water consumption from an increase in (and concentration of) wastewater?
- How do we avoid that rising demand for cooling energy production results in the warming up of our watercourses?
- How can the construction of infrastructure increase infiltration?
- How can food production increase water capital?
- How can increasing inland navigation increase water availability?

Creating an agenda of opportunities to combine, by organising own co-creation workshops to detect such opportunities. For example, in the water-energy nexus. In order to meet the climate targets, a major renovation wave is needed to make our buildings more energy efficient. In the context of the proposed recovery plan (2020), a label bonus and an interest-free renovation credit (where the interest burden is borne via advance payments from the Energy Fund and the Climate Fund) will be used to entice as many new owners as possible to comprehensively renovate their homes in the area of energy. Saving water is an important lever for energy-related renovation. Where are the opportunities, models, combinations of policy instruments? The ones where we can convert opportunities for connections into more impact?

We are setting up a scanning process in which we will search for opportunities to connect systemic changes in the various systems at the water-food-energy intersection.

DOES THE FARMER SOW HIS FUTURE IN WATER?

"To forget how to dig the earth and to tend the soil is to forget ourselves."

- Mahatma Gandhi

In the industrial era, the layout and development of the landscape was primarily determined by agricultural developments and needs. Society was largely focused on its basic need for food supply. The use of water in this respect was a natural given. Knowledge of the local water system was essential, as well as knowledge of the soil, natural vegetation, etc.

In the industrial era, the agricultural sector became less and less dominant. The sector benefited from industrial developments, machine-based working methods, the introduction of new methods of fertilisation, and chemical control of pests, diseases and weeds allowed the agricultural sector to produce at larger scale.

After the Second World War, the emphasis in the sector shifted even further towards large-scale and efficient production. "No more hunger" was the adage. This was definitely the case in the western world. However, when the original goal of "no more hunger" had been achieved, we continued down the same path. Larger scale, more efficiency, etc. has continued up to the present day. The focus has shifted from "no more hunger" to economic profitability.

Unfortunately, this development has gone hand in glove with a number of undesirable side-effects. Pollution and overloading of water and soil systems, reduction of biodiversity, less healthy products, etc. are just some examples.

Besides these negative consequences, the profitability of the sector has also come under pressure. Products are produced locally or regionally by a large group of agricultural operators, but for a global market with players who have enormous market power. As a result, the prices of products are under pressure. At the same time, climate policy and animal welfare are putting more and more regulatory pressure on the agricultural sector.

A new role for the agricultural sector?

Within the frameworks mentioned above, farmers are also stuck with a rather one-sided focus on food and crop production, prioritising yield rather than, for example, water buffering or energy production.

Nonetheless, farmers are in an excellent position to know the capacities of their soil, and to use that soil much more flexibly according to needs and climatic changes. The farmer could become a central pivotal figure in a resilient deployment of land and soil in light of the various sustainability challenges facing us. Luc Lavrijsen, member of the arena and a farmer, was very clear: “If tomorrow someone wants to pay me for buffering water, I have everything I need to do it in a good and effective way. It could also make more sense than competing against the blueberries that are flown over here onto the market at lower prices, for example’. But the energy transition also offers opportunities. “It appears that 8,000 years ago, farmers found the best places to harvest solar energy on earth,” according to American teacher Chad Higgins regarding the concept of ‘Agrovoltaics’, the combination of producing energy and food.

And here, too, there are possible opportunities for connections: for example, think how soil management affects the washing away of substances and matter from the fields to watercourses. This results in dredging costs. What if these dredging costs were seen as an investment budget to support farmers to make their soil more water retentive, and their food production more sustainable as a result, then a structural saving on dredging costs could be achieved thanks to enhanced sustainability. Worth looking into, right?

Wouldn’t it be great to develop a new future-proof perspective for the farming trade? A pivotal figure in applied sustainability policy. A challenging profession, with high social appreciation. Can we work together with young, driven farmers, financiers, governments, technology companies, etc.? See how we can devise a social business model for that profession? By designing appropriate value networks, by setting up concrete experiments. By developing new, attractive training for them, which lets them work their land as applied systems thinkers. By offering the profession an attractive long-term perspective once again.

FUND FOR SUSTAINABLE PRODUCTION METHODS

Farmers and supermarkets are generally at odds with one another. The price for the purchase and sale of agricultural products is a source of fierce dispute. The trust between the two parties is delicate. Supermarkets have charters and labels that promote sustainability, but these often also impose extra rules (and therefore costs) on farmers. Then the tensions over price and pay can flare up again. How do we break this vicious circle and restore trust between all parties?

Supermarkets can guide consumers in their purchasing habits. A customer who believes that a supermarket is heading in an unsustainable direction is one of these triggers, and appears to work. Propose a brand new charter or label that can embody that renewed confidence. An agreement between the supermarkets and farmers to levy a "tax" on non-certified products, which cannot therefore be trusted as being truly sustainable, which are sold on Belgian (or Flemish) territory, and transfer the proceeds to a fund. Certified products purchased by consumers are exempt from this tax. The proceeds are redistributed from the fund to the certified producers in order to reward sustainability. Best half mechanisms are a variation of this. Here, only the best half of the suppliers are financed from the fund. To be eligible for the fund, you therefore have to be in the best half. That creates a race to the top, instead of the usual race to the bottom.

What would such a charter, with its associated pricing mechanism, look like in practice? What financial experts can develop this system further? What supermarkets and farmers want to be the pioneers in it?

H2O 50 TRANSITION ARENA WATER

CHANGING GLASSES GIVES A FRESH PERSPECTIVE: FROM EMISSION TO IMISSION AS THE GUIDE

We are good at optimising the subsystems, without really understanding the interactions between these different subsystems. As a result, we take specific actions that may have a negative effect further down the line. It is also at the level of these subsystems that objectives are set out (and innovation is driven). For example, in the area of water, standards are imposed, and the discharged waste water from a sewage treatment plant must comply with these. When there is heavy rainfall (thereby diluting the waste water and lowering the performance of the water treatment) it will be decided to activate a number of overflows, so that the standards can be complied with. However, activating the overflows (whereby untreated water is discharged into a watercourse) can have a much larger negative impact than discharging less well-treated waste water.

Focusing on optimising the overall system could mean, for example, moving from an emission to an imission approach, starting from the concentrations in the environment (rather than at the point of discharge) in order to control different subsystems on this basis. In the example above, this would mean that, in the event of heavy rainfall, it would be more appropriate not to activate certain overflows, and to have the sewage treatment plant treat the waste water at a lower performance level (more flexible discharge standards). In the event of drought, the discharge standards could be tightened, as the performance of the installation would then be better. The point is to see what the ecology in the receiving water is equipped to do, and build and manage the infrastructure on this.

In a climate of more extreme weather conditions, it is becoming increasingly important to control the functioning of the subsystems, instead of the entire situation at ground level. To bring this about, another step still needs to be taken to integrate/link the various subsystems (as well as their models - which is not always obvious from a software point of view either). These include integrating sewage treatment models with watercourse models, drinking water models, models of other users: energy, transport, etc.

We are setting up a test in which we examine to what extent it is possible to control the situation on the ground with the models, processes and instruments that are currently devised and installed for this control on various subsystems, so that an approach towards systemic management becomes possible.

H2O 50 TRANSITION ARENA WATER

THE WATER KILOMETRE

Did you know? The speed of water in drinking water pipes and in Flemish watercourses is approximately several dm/sec. Groundwater flows much slower, with speeds of around several cm/day.

Transport and mobility are central issues in various sustainability challenges. The idea that a sustainable world is one in which light things are exchanged globally (e.g. information), and heavy things remain mainly local and organised in cycles as much as possible, is anything but elaborated as a vision, but it is expressive and powerful in its simplicity. This means that any source that is essentially always nearby, such as water, will also be transported as little as possible, because transport requires more infrastructure, energy, space, as the distance increases.

Water is not as fast and flashy to move as electricity, information or gas. Transport over long distances is also vulnerable. As such, it is better to focus on the availability of "nearby water". Guaranteeing this availability means retaining water locally, moving as little water as possible to other regions unnecessarily, and being as independent as much as possible from other regions. Independence therefore also means that a business park, district, or individual building draws as little water as possible from its surroundings and discharges as little waste water into it as possible.

Both extraction and discharge are important in this regard. The impact of importing and diverting water must be taken into account. Today, for example, rainwater is increasingly used to flush toilets; this avoids the need to supply treated water from somewhere else. It is commendable that rainwater and not tap water is used, but after, the rinse water typically ends up in the sewer, and that is how the rainwater is transported over a longer distance, treated and generally discharged into a canal.

It would be better if the rainwater, once used, is treated locally and infiltrated into the soil. Of course, this means that it is not enough to tap alternative local water sources, but that treating water to a standard that allows for infiltration and buffering in the surrounding area is also necessary. There are many advantages to this, such as less need for transporting mains water, less need for sewers, better water buffering through gradual infiltration. The technology to set something up like this already exists, and can be applied at building or neighbourhood level.

To facilitate it, the policy instrument of the Water Kilometre can be used. Where the water kilometre is the volume of water that has to be supplied or diverted over a given distance (km) over a period of 1 year. A price can then be associated with this water kilometre. This encourages companies to set up where water is available, or where better water treatment technologies have been installed. A (drinking) water company or private actor can proactively take on a role by purifying waste water into drinking water in order to reduce the water kilometre for the city as a whole.

We would like to calculate this policy instrument further and come up with an answer to the following questions: (1) How is the price set?; (2) How do we bridge the period in which the poorest will have to pay the additional cost? How do we ensure that we do not end up in a situation where social compensations cancel out profits, and (3) What is the added value of the water kilometre in reducing peak consumption?

H20 50 TRANSITION ARENA WATER

THE WATER PHARMACIST

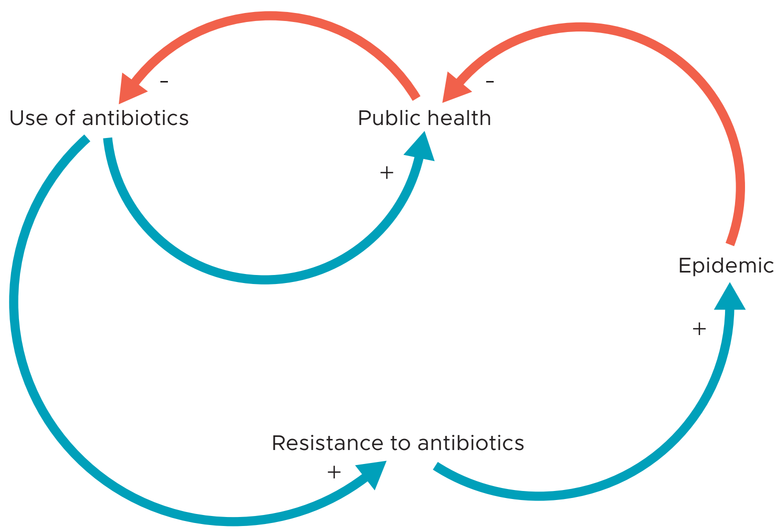
Water is the gaze of the earth,
its instrument for looking at time.

L'eau ainsi est le regard de la terre,
son appareil à regarder le temps.

- Paul Claudel

Man as the end station, or man as the starting point?
Every year, around 1,500 tonnes of active pharmaceutical ingredients (excl. the excipients) are supplied in Belgium via pharmacies and residential care centres. Antibiotics, hormones, anti-inflammatory drugs, beta-blockers, blood sugar lowering agents, etc. require special attention. A not insignificant proportion of this pharmaceutical use is related to our Western lifestyle. For example: lots of sugary, salty and fatty food, plus overeating and too little exercise, smoking and excessive alcohol consumption. In addition, the huge pressure to work and perform in Western society also plays a role, as this causes more stress.

Most of this prescribed medication is taken and then excreted through urine. As such, the active substances inevitably end up in the environment. Because medicines are designed to act on living organisms in low doses, they also pose a risk to the environment. The surviving active particles are already causing a shocking range of undesirable side effects: fish and amphibians are becoming more feminised, fish more reckless and thus more vulnerable to predators with an impact on reproduction, abnormalities in organ development. Many of these issues have systemic characteristics. Take resistance to antibiotics for example. The excessive use and discharge of antibiotics into water creates resistance, which leads to a self-reinforcing vicious cycle in which increasing epidemics lead to more antibiotic use, resulting in even more resistance with the risk of more epidemics ...



All these medicines which have been examined are found in our surface waters. The health of our watercourses therefore teaches us a lot about the health of our society. And because of the ageing population, the evolution of the health sector, etc., more pharmaceutical substances will be released into the environment in the future, if no measures are taken. Moreover, climate change could magnify the impact of this on the environment: in times of drought, concentrations of active substances in watercourses will be higher, thereby having an impact more quickly. At times of heavy rainfall, overflows may be activated, which could also lead to further spreading of these substances. Our approach to health therefore erodes the Water capital, with society picking up the bill. Can we rethink this process, with an approach that enhances the Water capital?

Caring for water is caring for people

The healthcare system today is to a large extent a 'reactive anthropocentric system': we are organised to react when people fall ill. For example, hospital funding is based on the number of sick people who are admitted rather than the number of healthy people in the area. The corona crisis has already intensified the need for more funding to flow towards green and blue (water) infrastructure in public spaces for the benefit of public health (including mental well-being). The system issue that thus arises is how costs avoided in the health system can be mobilised to strive for a pollution-free environment.

Together with actors from the entire care and health chain, we want to look for innovative possibilities and opportunities that we have never thought of before, or redesign or optimise existing systems. We are contributing knowledge that can lead to a more water-friendly design of medicines. We are brainstorming together with doctors and pharmacists about how to prescribe medicines in a water-friendly way. We are looking at financial levers to place actors more 'upstream' of their responsibility. We are looking at how care forests can reduce the need for medication, while simultaeously promoting buffering, CO2 storage and cooling.

THE RICE FIELD COMMUNITY

When the soil is completely saturated with water, e.g. after prolonged rainfall, there is limited infiltration of rainwater, i.e. it does not penetrate further into the soil. The soil acts like a “paved surface” and the water will flow directly to the receiving watercourse. The water is only held up to a limited extent above ground level by the presence of vegetation or minute differences in topography.

Around the world, we find examples where there are different approaches to this overflowing water, with buffers which try to capture it. Rice fields are an obvious example. But also Machu Picchu, for example, where more than seven hundred terraces held the upper soil, enabling more forms of agriculture, and which were part of a vast water supply system that stored drinking water and prevented erosion of the steep slopes.

Imagine if we applied this philosophy in the Flemish Ardennes or other hilly areas. Building small dams or terraces on the plots on the hills. This could be done, for example, by planting hedges along the edges of plots, which automatically creates small terraces, a method that our ancestors often used in the area around the Flemish city of Voeren, for example. This creates an extra buffer so that the water from the plots is initially retained behind the dike or hedge, to the point where the buffer is full and the water flows slowly over the dike into the watercourse. This way, peak flows to the receiving watercourse can be reduced, thereby limiting possible downstream floods. Moreover, the loss of fertile farmland is also prevented. Another advantage is that it is not concrete infrastructure, but is adaptable to the ever more rapidly changing context in which our relationship with water has to take shape.

How much water can be held in our hilly region when you build small 50cm dams around meadows and fields? What cooperation between landowners, farmers, tenants, residents, etc., is necessary in this regard? How do we envisage this management? How do we enhance local knowledge (water citizenship) about water, so that farmers and landowners can manage the system themselves?

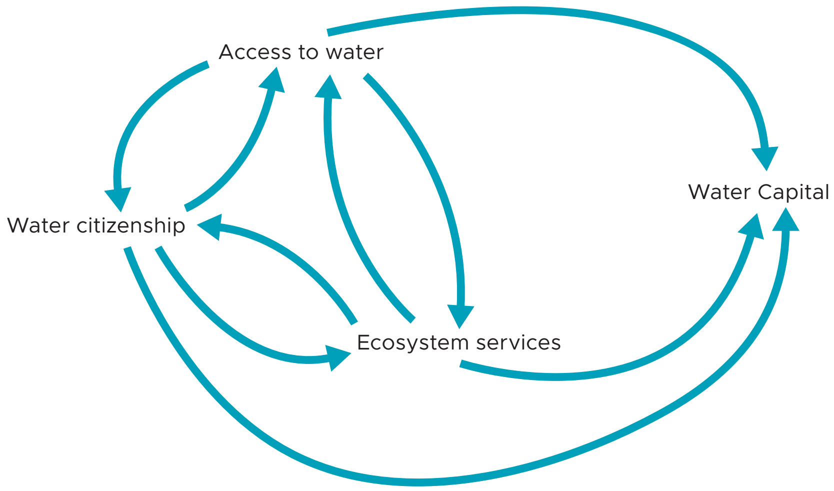
H2O 50 TRANSITION ARENA WATER

THE SYSTEM IS A MODEL FOR WATER CAPITAL

A common line of thought is that water is too cheap and that a change in behaviour can only be achieved through price increases. The problem is that putting a price mechanism right in the middle of the market results various undesirable side-effects. For example, certain income classes will be severely disadvantaged, meaning that social adjustments will have to be made, which costs money. And more affluent people can justify increased use: "I'm paying for it anyway, so what's the problem". So you run the risk of what we have come to call 'yellow vest sustainability'. At the level of economic actors, however, price mechanisms can be used to keep companies away from the most vulnerable sources. But you are actually shifting the pressure to another water source, which in turn may become vulnerable. Control via price does not give a signal to the type of activity you want, and is definitely not a constructive mechanism to support the development of that type of activity. As long as a company has a well-functioning business model, and can therefore continue to pay the cost of water, chances are that everything will stay as it is. Water is still virtually invisible in the accounts of many companies, because these accounts record its importance in terms of euros, not in terms of dependence. Water may only represent a small budget, but if were to vanish, the company would be unable to function. Small innovative practices and companies, despite their strategic importance, should then try to prove themselves in an environment that opposes rather than supports them.

Based on statistical research into the demand for drinking water according to the applied rates in the past, the price elasticity could be determined on the basis of empirical data. The price elasticity is -0.17; which means that if we increase prices by 10% in Flanders there will be a decrease in demand of only 1.7%. In other words, the demand for water is fairly inelastic and depends only to a limited extent on price, at least at the current price level of water.

Besides the fact that a price mechanism does not provide the desired incentives, we can also highlight that the price of water is highly politically charged, meaning that the price mechanism only has limited room for manoeuvre, which only calls more urgently for other approaches.



Another way of thinking is to consider water as broad social capital. And as with any other form of capital, you want to increase its value. Within the water arena, a thought process was started, with the assertion that three variables must be in a balance sheet in order for the Water Capital to increase.

- *Access to water*: an indication of the usability (quality dimension) of water for the various users (from industry to nature) and also of the volume (quantity) of available water.
- Water citizenship: the degree to which citizens (water users) are aware of the water challenges, they have knowledge of and insight into the water system, and (as a result) also take their responsibility in managing the water system (and their connection with water also becomes much broader than it is today. Today, the main connection with personal water use is the water bill). An ideal cause and effect relationship between "Access to water" and "Water citizenship" is that increased access does not translate into maximum consumption.
- Ecosystem services (including economic services): the value provided to society via water.

Instead of relying on price, you rely on these three variables to enhance water capital.

We are using system dynamics modelling to explore the potential of this paradigm as a basis for system change. In interdisciplinary co-creation sessions, we are investigating the relationships between the three corner stones of Water Capital, and devise relationships that could be effectively calculated via the model. This would provide the necessary new insights into the possible social and economic benefits if the guiding philosophy for the water system were to be built up from this elaborate analogy with the (purely) economic concept of capital.

H2O 50 TRANSITION ARENA WATER

THE WATER BATTERY

In the past, we wanted to get water away from the city as quickly as possible. In recent years, cities have been increasingly embracing water. "Water in the City" projects are appearing ever more often, the discourse around green-blue networks and infrastructure is intensifying: from reopening watercourses to integrating water storage in squares and playgrounds. Citizen projects (collecting water from large roofs, using drainage water from construction sites, etc.) also mean that we are increasingly seeing the city as a sponge of and for water, and we act accordingly.

What if we go a step further and let local residents collect the rainwater in their neighbourhood and manage it together? Imagine a large "battery" of water storage facilities that collect the water from all the large roofs in the centre of the neighbourhood. What happens if you leave the management of these cubic meters to the local water knowledge of the residents and local organisations? How could they manage it in order to deploy the buffer at peak moments (let it drain and fill up at the right times)? What is the necessary expertise in this regard? What new forms of entrepreneurship would such a water battery attract? What creative ideas could develop from this at the neighbourhood level? A sustainable carwash, a network of taps with rainwater throughout the neighbourhood, a corresponding roof vegetable garden...?

In new housing estates, ideas on sustainable water use can easily be integrated, as the necessary infrastructure can be planned in advance. In existing neighbourhoods, you need to work with the existing infrastructure and the existing social network. It is therefore all the more interesting to focus our research on these existing neighbourhoods, to see what is necessary in order to store water there. Cities and neighbourhoods are constantly changing, and space is scarce. Finding a "permanent" place for a water battery will not be easy, but what if we find a system that is modular and portable? A battery that can move from one temporary empty spot to another?

In Ghent, we already found a location that we think could be eligible for a temporary experiment. In neighbourhood park De Porre (in the centre of the Moscou-Vogelhoek district) there is an old textile factory with an abandoned depot. Around the park there are 14,000 square metres of roof area on larger buildings (schools), where water can be collected in the abandoned depot. More than 10 million litres of water can be collected in the depot, in cubitainers or other forms of storage. Water is already central to the design of the park. Imagine the dynamism this water battery could bring to the neighbourhood?

Can we design a modular "water battery" that can be installed in a central spot in a neighbourhood? What would have to be put in place for a community of residents to manage it? What would be the outcome in terms of water awareness in the neighbourhood? Could it help schools with educating children in a new way on how they look at water?

H2O 50 TRANSITION ARENA WATER

MANY HANDS MAKE LIGHT WATER WORK

The user engaged, space for creativity
If we bring the management of drinking water closer to the user, we create a safer system and greater water awareness. In the future, the composition of drinking water will increasingly be adapted to the preferences of the user. “The role of the government will then be to ensure that everything takes place within the framework. The user can decide the rest, which will lead to a new combination of central and decentralized services”.

“Bringing the product closer to the consumer stimulates creativity. A good example is San Francisco. Here, having a water policy is compulsory even at the building level. The nice thing is that people experience for themselves that they can do more with water.” Korneel Rabaey, member of the arena and professor, hopes that there will also be compulsory self-provision of water in Flanders in the future. “This will boost innovation. Many things are already possible in technological terms, it’s just a question of whether we are bold enough to take the step financially”. Korneel is convinced that technological investments will pay for themselves over time. “For example, there is already a brewery that purifies its own waste water. That investment will pay for itself within a few years”. Or take the port of Ghent, which is able to be self-sufficient. The only question that remains is, “Do we take the plunge”?

Water fund for radical and decentralised research
Ultimately, Korneel dreams of structural innovation and sees a water fund for radical water innovation based on the example of the excellent water sector in the Netherlands. “For me, structural research means from research to implementation, we shouldn’t just limit ourselves to replication.” Korneel already has a number of topics in mind and talks enthusiastically about the possibilities: ‘We have to look at salt flows in a different way, the technological challenge being able to separate salt. The knowledge and technology is here in Flanders, we have the skills, it can go faster”.

And on the example of the buildings in San Francisco “we resemble San Francisco a lot in terms of water quantities, I can picture a pilot of 100 buildings that are ready to set up their water policy at building level”. A decentralised future, greater awareness of water among users with plenty of room for structural innovation. If it were up to Korneel, it would be these steps that would help us progress in the coming years.

He sees us starting to work on issues such as “What is the scale of the circularity?” “At what level can you best be self-supported?” and “How do we connect water systems with each other?”

WATER IS THE NEW GOLD

"When the well's dry, we know the worth of water."

- Benjamin Franklin

Over the centuries, water has primarily been seen as something to use or consume. Appreciation for water has often been somewhat lacking. Attention was mainly focused on energy sources, which are linked to power and financial gain. Availability of water (especially in our western world) was never a real problem, neither quantitatively or qualitatively.

In recent years, however, it has become clear that there needs to be more focus on water in our society. Both when it comes to the availability of water (or the lack of it) and water pollution. In fact, we have both an (imminent) obstacle and a damage crisis when it comes to water. We can survive without equipment and machines that depend on other resources, but no-one can survive without water. Water is the capital of life.

Soil and water value

Our financial system is more or less linked to raw materials, in fact everything to that comes out of the ground. You could say there are three levels of value, with raw materials as the primary level, everything that is made from them as the secondary level, and the financial system created to keep the economy running smoothly as the tertiary level. Money therefore has a soil value, as it were, but is only a derivative of what is real value.

Water is often 'overlooked' in this calculation. But if we are talking about soil value, we can also mention water value, or water as capital. Now that the global economy is out of balance, the soil and water value of money is becoming important again. It is the only thing we can fall back on in a real financial and economic crisis. Nonetheless, calculating the true soil or water value is difficult. There are polluted soils, minerals that are depleted or no longer present, water areas that no longer provide clean water, etc.

Soil and water systems will need to be revived. Water must be purified again and raw materials already used must be recycled. To achieve this, we need a bridging phase that needs to be optimised from the perspective of a frugal policy.

In order to make a success of this revival, a broad support base and a broad coalition of actors/stakeholders are necessary. Collaboration is essential. Within this process of re-assessing the soil and water value, investments will have to be made. Profitability from an economic perspective in combination with sustainability in and for society ensures that investments in this area will become life-giving again.

Pure water capital can give positive returns, and the value can grow or at least remain constant. Keeping some aside, we can manage the future water capital for future generations in a circular and sustainable model.

Valuation: What kinds of value can we give to water? How do we assess them? How does this relate to other economic values and mechanisms such as prices, taxes, subsidies, etc.? Who is responsible for these values, and how? In other words: Can we develop models that make this transparent and show what depends on what? If so, who and what do we need?

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JACOB AND LI-AN GO FOR A WALK

Arena processes always lead to fascinating encounters, which automatically prompt new action. As such, Jacob Bossaer of BOSAQ and Li An Phoa of Drinkable Rivers were highly intrigued by each other's stories, and the feeling that they had common ground from their very different perspectives. That is why they wanted to go for a walk on 1 April 2020. Making conversation together, during a walk on the banks of a river somewhere in Flanders. Because the environment in which they were walking would determine the conversation, they found it important and a form of gratitude to share their insights at the end of the day with someone who had helped shape that environment and who, from a policy perspective, might have been able to help with the insights from the walk. Governor Cathy Berx had already agreed to meet Jacob and Li An at the end of a walk along the river Scheldt, and to discuss their results. Unfortunately, this never took place due to corona, but the plan remains.

Jacob and Li-An pencilled in a date for another walk as soon as possible. We are still looking for support for the logistics, in particular for capturing the conversation and turning it into an inspiring article and an aftermovie.

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