

# How to create Natural Capital through nature-based solutions

Piloting the methodology  
on 7 water replenishment  
projects across Europe



# Executive summary

---

**Water stewardship is one of the key sustainable business priorities of The Coca-Cola Company (TCCC).** At its core is global water replenishment, returning to nature the equivalent of all water use in our products and processes. We achieve this through an extensive water replenishment programme - we support nearly 250 watershed conservation and community water projects, and around 300 programs worldwide. To implement these, we work together with a diverse set of partners, including leading NGOs and nature conservation organizations.

**The benefits of water restoration are not just about water volumes.** Through restoring nature and providing ecosystem services, water replenishment can bring many additional societal benefits. For TCCC as a company, water replenishment projects are an instrument for managing risks in the watersheds in which we operate.

Through the co-benefits of ecosystem services, water replenishment projects in fact act as Nature-Based Solutions to societal challenges. **The potential of Nature-Based Solutions is clear, but we need to build the business case - attract more private-sector interest and more investment.** The challenge lies in measuring, understanding and managing this potential across our diverse range of projects worldwide. And doing this in close collaboration and connection with other stakeholders and partners.

**To enable this, we have developed and piloted a standardized methodology** for accounting for the ecosystem service benefits of water replenishment in economic terms. Our pilot projects show that in different contexts, water restoration can enhance a range of ecosystem services in addition to **providing water, including carbon sequestration, water quality improvement, flood protection, recreation, as well as food & raw materials provisioning.** What is more, if done right, such projects have a positive return-on-investment for the society, with ecosystem service benefits “paying back” the original investment in limited period of time. We have found that ecosystem service benefits tend to increase linearly with investment, though there are opportunities for “easy wins”, where relatively modest investments can bring disproportionately large benefits.

**The importance of good data gathered on-the-ground cannot be understated.** One of the key learnings from engaging with project implementation partners during the development of our methodology has been that having clear data needs and structured approaches for valuation is necessary. This allows partners to integrate required data collection from project onset, while also keeping the additional workload required for monetary valuation manageable. Knowing data needs and valuation approaches beforehand also allows for forward-looking screening of potential benefits at the planning stage.

**We recognise that not all benefits can or should be monetized. Non-monetized indicators are also important for sound and useful decision-making.** In particular, we have identified biodiversity as an area where collecting data for non-monetary indicators can be valuable, as current methods for monetizing biodiversity benefits offer limited practical utility. In some of our projects, Social Capital benefits can also be very important - while we plan to explore potential economic valuation for some Social Capital issues, there are some benefits such as from capacity building and outreach activities where potential ripple effects can be large but difficult to pin down in economic terms. In such cases, non-monetized indicators are an obvious and necessary alternative.

**We have developed our method, it is now time to put it in practice.** Throughout developing our approach, we have actively engaged with our project partners, all experienced water management and nature conservation professionals with valuable practical insights, who are intended as the main users of our methodology. We have also conducted sensitivity analysis of our results - this can yield good additional insights by outlining the limitations of the methods used, as well as aiding in the interpretation of results. Finally, we have independent review of our methodology and pilot projects - an extremely valuable exercise, which has allowed for not just ensuring that our work rests on sound science, but also for identifying where it makes the most sense to focus efforts for further improvement. We plan to continue testing our methodology across different projects globally and will also take onboard suggested improvements as concrete next steps.

**Going forward.** We plan to further engage with ongoing initiatives for Nature-Based Solutions, such as the CEO Water Mandate’s *Benefit Accounting of Nature-Based Solutions for Watersheds* project, which we are currently part of. We aim to leverage our influence as one of the world’s leading brands in order to bring into the discussion additional businesses and investors. In addition, we are committed to test and refine our methodology on different water replenishment project types in additional territories across the globe.

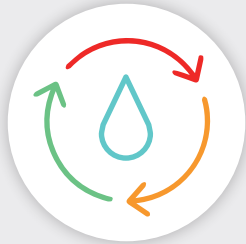
**Building back better.** In the aftermath of 2020, we are faced with a unique opportunity to steer the state-of-play toward a “new normal” where enhancing nature and good business go hand-in-hand. We are convinced that Nature-Based Solutions through watershed restoration can be a powerful tool in this regard.

# The Coca-Cola Water Replenishment Programme

## Pursuing water security

We are working in our own operations, across our value chain and in watersheds worldwide to support water security.

### GOALS



**Replenish** all the water we use in our finished beverages by 2020.

**Improve** our water efficiency by **25%** by 2020.

2020 GOAL  
**100%**



As estimated working with our many external partners and using generally accepted, independently peer-reviewed scientific and technical methods. External assurance of 100% annual replenishment rate. Finished beverages based on global sales volume. Water in production is returned safely to nature and communities via high-quality wastewater treatment.



**5 YEARS**

we've met and exceeded our water replenishment goal.

We've replenished a total of

**1.5+ TRILLION LITERS**



of water since 2012 through about 300 projects each year.



**160%**

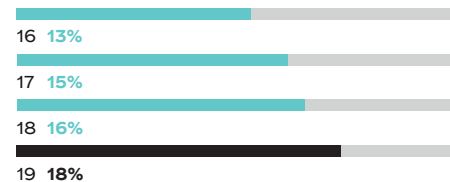
of the water used in our finished beverages was safely returned to communities and nature in 2019.

Since 2010, our community water programs with our partners worldwide helped to provide access to safe drinking water and sanitation to **10.6 million+ people**.



During 2019, we continued to improve the efficiency of our water use. We now need only **1.85 liters** of water per liter of final product, an **18%** improvement compared to 2010.

2020 GOAL  
**25%**



While we have made significant progress on water efficiency in production, we recognize that we will not fully meet our goal of 25% improvement by 2020.



**A-**

Our 2019 CDP Water disclosure placed us in the leadership range of scores.

**#1 RANKING**

on water risk management in 2019 Ceres report among beverage company peers.

# Introduction

No resource is more precious to human life and the health of our global ecosystems and economies than water, which is under increasing stress due to rising demand and the effects of climate change. As the world's largest beverage company and because we are dependent on good-quality water, The Coca-Cola Company (TCCC) has a responsibility to protect water resources and provide leadership on water stewardship. This is why, in 2007, we committed to safely return to communities and to nature the equivalent of all the water we use in our products and processes by 2020.

We achieved this goal in 2015, five years ahead of our original target. In practice, we are returning about 192 billion litres of water to the environment each year through supporting nearly 250 watershed conservation and community water projects, and around 300 programs worldwide, implemented in partnership with a diverse set of partners, including leading local and international NGOs and nature conservation organizations<sup>1</sup>. Each project has a specific objective, such as providing or improving access to safe water and sanitation, protecting watersheds, improving water quality and supporting water conservation.

While water replenishment is the main goal of such projects, they undoubtedly bring multiple other benefits. We are looking at new ways to measure and manage these additional benefits – not just to enhance our water stewardship, but to help build the business case for investing in nature-based solutions (NBS).

We acknowledge that we need to reduce the environmental impacts of our operations and recognize that we can play a role in regenerating nature. By establishing a holistic value or Return On Investment (ROI) view of Nature-Based Solutions, we believe that we can strengthen the business case for investment and scale the positive impacts for nature and communities.

We believe that quantifying the co-benefits of investing in nature will help us to further push for using nature-based solutions toward building resilience into our operations, supply chains, and the communities in which we operate. With this practice-driven White Paper on creating Natural Capital through water replenishment, we hope to contribute to the important work on financing nature-based solutions toward addressing our shared societal challenges.

<sup>1</sup> See also in our latest Business and Sustainability Report: <https://www.coca-colacompany.com/reports/business-sustainability-report-2019>

<sup>2</sup> As defined by the Natural Capital Finance Alliance

# Why Natural Capital?

**Natural capital** is defined as the world's stock of renewable natural resources that combine to yield a flow of benefits to people<sup>2</sup>. The concept of Natural Capital (NC) has emerged in recent years as a means to facilitate the assessment of a company's or project's net impact on the environment and society. By enabling "like-for-like" comparisons, it closes two gaps at once:

- between different ecological metrics; and
- between ecological and monetary terms

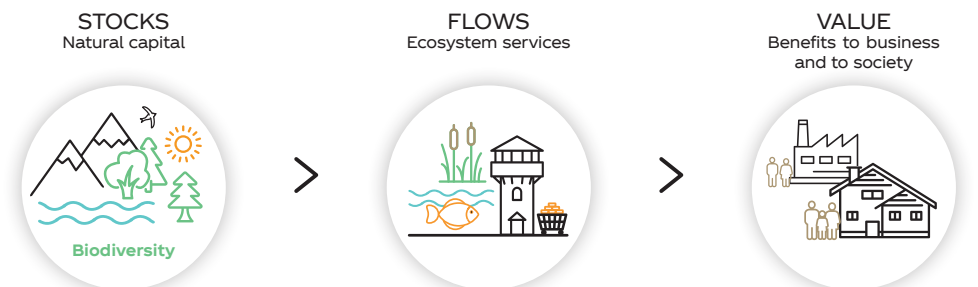
Bridging this gap is important – we are faced with multiple global challenges due to loss of nature, climate change, and rising inequality, yet traditional decision-making falls short in recognizing business dependence on nature, people and society. Enhancing natural capital has **tangible economic value**. Economic valuation provides us with a tool to bring the benefits of nature to the economic realm. This offers a holistic way of thinking, which will allow for our replenishment projects to be evaluated not just as a means to restore water, but truly as **multi-benefit, nature-based solutions to complex socio-environmental challenges**.

## Water replenishment projects

**Natural capital is the stock of renewable natural resources** on earth (e.g., plants, animals, air, water, soils) that combine to yield a flow of benefits or "services" to people.

**Ecosystem services are the flows of benefits to people from ecosystems**, such as timber, fiber, pollination, water regulation, climate regulation, recreation, mental health benefits, and others.

By restoring nature and preserving resources, **water replenishment projects enhance the stock of natural capital, thus leading to increased flows of ecosystem service benefits to people**.



# Measuring ecosystem services benefits of water replenishment projects

Measuring ecosystem service benefits for water replenishment in practice can be challenging. Project partners are typically conservation professionals but may not always be experts in economic valuation. They can benefit from easy-to-use guidance. What is more, without a unified method, it is difficult to compare results from different projects. In order to facilitate these, we have developed guidance that aims to be:

## Relevant:

Providing a way to measure material benefits and be applicable to ideally any replenishment project.

## Rigorous:

Based on up-to-date robust science, fit-for-purpose, and transparent in its assumptions and limitations.

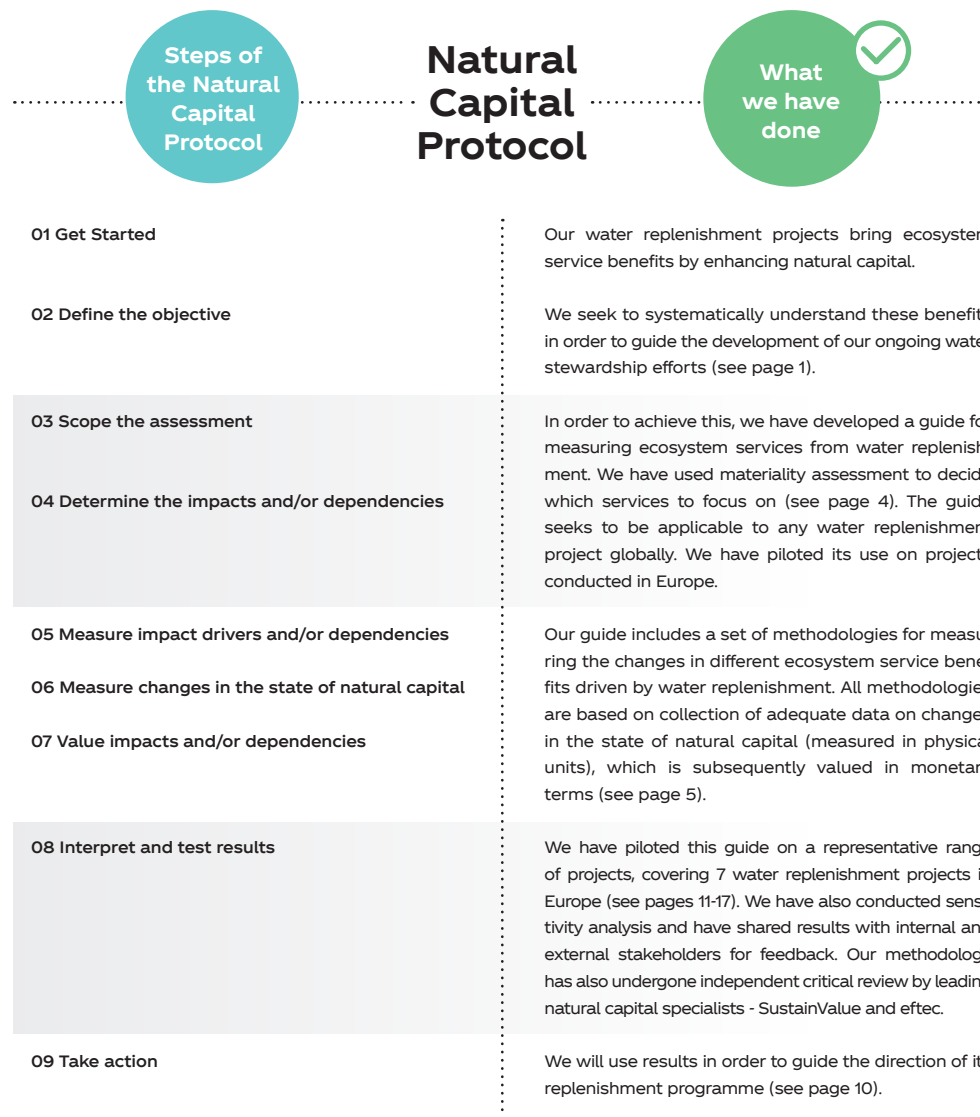
## Replicable:

Providing the necessary documentation and common tools in order to make valuation of ecosystem services accessible for non-specialists. Structuring the assessment in a way that allows for verification and auditing of results<sup>3</sup>.

## Consistent:

Providing methods that serve as a fit-for-future common standard, which would allow for a common and comparable way of assessing the value of ecosystem services of replenishment projects carried out in different countries, with different goals and scopes, and within different contexts.

To this aim, we have used the Natural Capital Protocol as a framework for developing such guidance that we intend all project partners to use when reporting on water replenishment achievements<sup>4</sup>.



<sup>3</sup>Independent auditing of results has been standard practice for TCCC's Water Replenishment programme since its inception.

<sup>4</sup>Our full methodological document is available at:

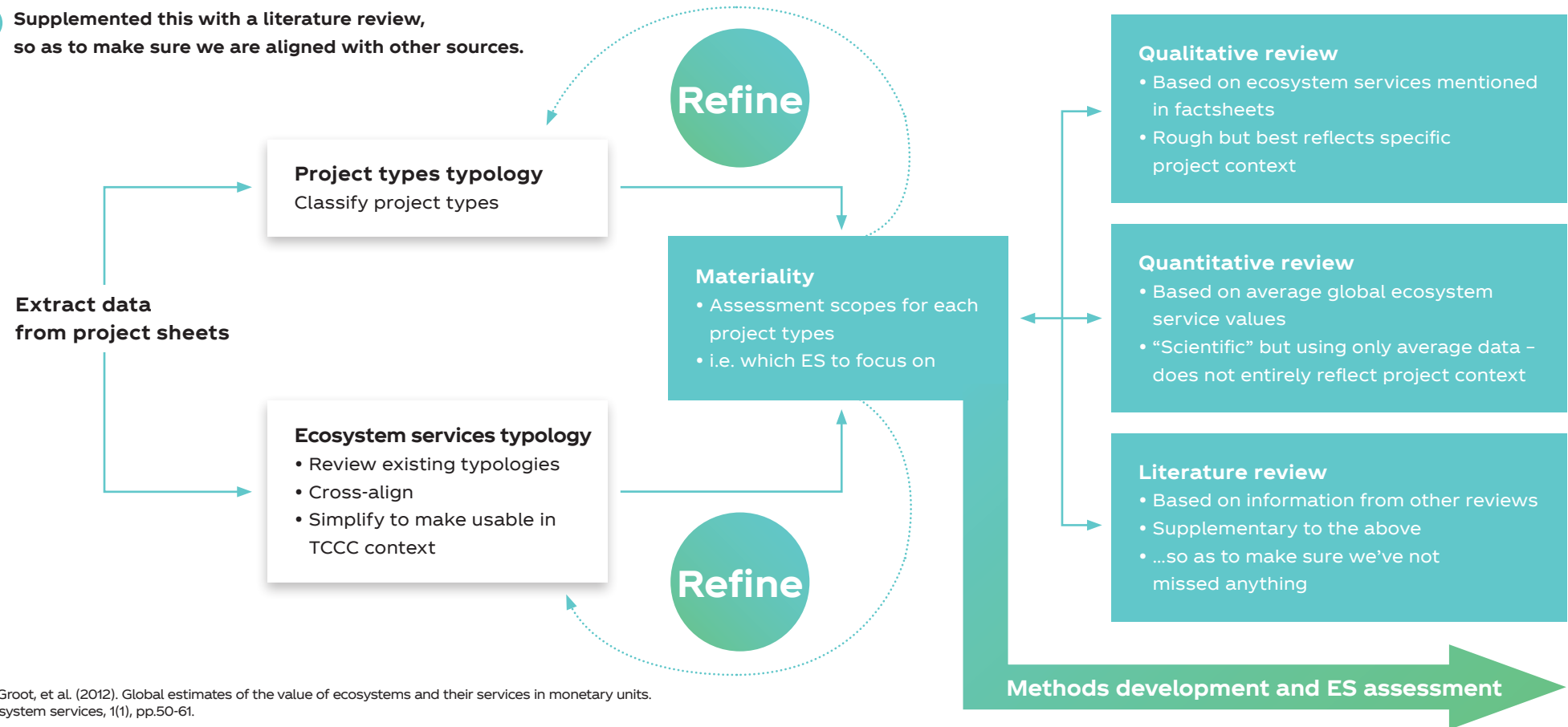
<https://www.coca-cola.eu/news/supporting-environment/creating-natural-capital-through-nature-based-solutions>

# Materiality assessment | Identifying our key ecosystem services

Water replenishment projects are potentially implemented in a variety of ecosystems. **Which ecosystem services do we focus on for different projects?** We have conducted materiality analysis to identify the most important ecosystem services that stem from our water replenishment work. For this, we have:

- 1 Reviewed what ecosystem services our projects provide.
- 2 Cross-checked priority by comparing with global average values<sup>5</sup>.
- 3 Supplemented this with a literature review, so as to make sure we are aligned with other sources.

The graph below provides an overview about the relevant steps within the materiality assessment



<sup>5</sup> De Groot, et al. (2012). Global estimates of the value of ecosystems and their services in monetary units. Ecosystem services, 1(1), pp.50-61.

# Materiality assessment | Identifying key ecosystem services

This gives the final **scope for our methodology**, summarized below<sup>6</sup>. These are the key ecosystem services that stem from the types of projects that we typically invest in. We intend for our methodology to be an evolving tool. We will revise this scope if new projects point to additional ecosystem services being significantly improved or impacted. In the spirit of our water replenishment programme, this will be done in collaboration with our project partners, and tailored to the needs of replenishment work going forward.










<b>ECOSYSTEM SERVICES</b> / <b>PROJECT TYPES</b>	<b>WATER RESTORATION</b> Increasing natural water retention by restoring or artificially constructing freshwater ecosystems.	<b>LAND RESTORATION</b> Increasing natural water retention by restoring or protecting terrestrial ecosystems.	<b>WATER, SANITATION &amp; HYGIENE (WASH)</b> Reducing primary water use and providing access to clean water via non-conventional water resource management.	<b>SUSTAINABLE FARMING PRACTICES</b> Reducing primary water use & pollution in an agricultural context
<b>Water quantity</b>	Benefit for people from use of replenished water volumes (incl. considering scarcity)			
<b>Water quality</b>	Filtration or dilution of pollutants from upstream	<i>Reduced runoff downstream</i>	Filtration, dilution or reduced runoff of pollutants	<i>Reduced runoff downstream</i>
<b>Flood protection</b>	Reduced damages due to reduced peak flows downstream		<i>Same, if potentially significant</i>	
<b>Carbon sequestration</b>	Wetlands protection & rewetting	Afforestation, reforestation, forest protection	Energy savings (avoided emissions)	
<b>Recreation &amp; education</b>	Recreational visits to project sites & associated spending and investment			
<b>Food &amp; raw materials</b>	Harvested and cultivated goods			Cultivated goods
<b>Biodiversity</b>	Changes in stock and quality of natural habitats, as well as changes in species abundance and diversity. Currently assessed only qualitatively (see page 7).			

<sup>6</sup> Text in *italics* indicates services that can be material but currently occur less often in the projects we have implemented so far.

# Methodologies for measuring ecosystem services

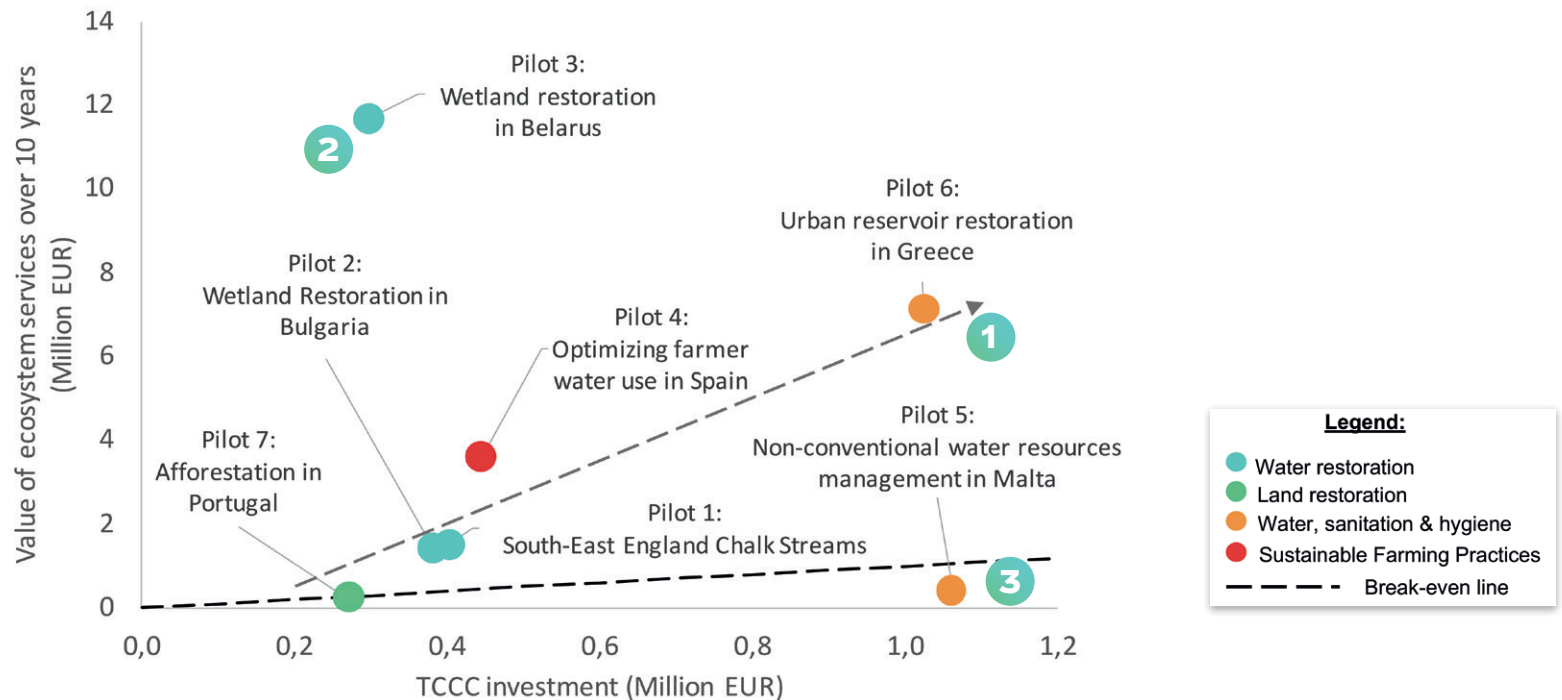
Our methodologies for valuing ecosystem services all rely on **gathering data on how projects influence natural capital on-the-ground**. This is all measured in natural units (such as m<sup>3</sup> of water, number of visitors, and kg CO<sub>2</sub>). This data on natural capital improvements is subsequently valued in monetary terms via a standardized approach. In this way, improvements to natural capital are linked to economic benefits, taking into account the local context in which projects are implemented. We also collect qualitative data on additional benefits, including social and human capital benefits.

ECOSYSTEM SERVICE	OUR APPROACH	WHAT WE EXCLUDE / SENSITIVITY ANALYSIS
 <b>Water quantity</b>	Market prices for water use by households, agriculture, and industry, adjusted for water scarcity. Applied to additional water made available in the catchment.	Benefits not from direct use are covered under other ecosystem services or assessed qualitatively. Sensitivity analysis shows that results compare well with alternative valuation approaches in areas where water scarcity is an issue.
 <b>Water quality</b>	Avoided costs of treatment of pollutant load by wastewater plants (pre-treatment) or constructed wetlands (post-treatment).	Downstream effects such as effects of pollution on human and ecosystem health. Sensitivity analysis shows that this does not significantly change results in most cases.
 <b>Flood protection</b>	Avoided costs of damages to economic assets downstream (properties, agricultural land, transport infrastructure).	Impacts from damage to vehicles and transport disruption, as well as intangible impacts on human health. Sensitivity analysis shows that only human health impacts potentially affect results.
 <b>Carbon sequestration</b>	IPCC* Tier 1 emissions factors used to assess net GHG benefits. Shadow price of carbon applied to wetland or land restoration projects. Traded carbon price applied to energy savings benefits.	For land restoration, CO <sub>2</sub> sequestration due to changes in dead wood & soil organic matter pools are excluded due to lack of IPCC emissions factors. Sensitivity analysis shows results to be reasonable ballpark estimates.
 <b>Recreation &amp; education</b>	Travel, on-site expenditure and investment. Travel to site or to next-best alternative.	The subjective value of site aesthetic, natural beauty or cultural significance is excluded, as well as potentially negative impacts of tourism. Contingent valuation to elicit willingness-to-pay values would be a specific specialist task.
 <b>Food &amp; raw materials</b>	Net economic value for farmers or foragers of wild goods (market price minus expenses).	No separate sensitivity analysis for market prices for crops which are potentially volatile which may influence results. Project partners should opt for using averaged prices over long periods in such cases.
 <b>Biodiversity</b>	Our preliminary assessment of biodiversity value with available data shows that currently available valuation approaches are insufficient. Thus, biodiversity is currently evaluated only qualitatively. We are exploring the preparation of a methodology for collecting data on biodiversity improvements on-the-ground, taking into account changes in quantity and quality of habitats, as well as state and presence of species on-site.	

\*IPCC: Intergovernmental Panel on Climate Change



# Summary of results | Ecosystem service benefit of our projects



1

In general, our results show that the larger the investment in individual projects, the largest ecosystem services benefits are accrued. Water quantity provisioning brings the largest overall benefit, though carbon sequestration has the highest ecosystem service return-on-investment<sup>7</sup>.

2

Certain projects can bring disproportionately large benefits compared to their initial investment. These tend to be such where the state of the ecosystem is severely degraded before project implementation. In such situations, relatively modest interventions can bring about big changes in ecosystem condition.

3

Some projects may at first glance perform poorly compared to financial investment. This may sometimes be due to poor project performance, though pilot projects show that this can also be due to not all benefits (especially related to social capital) being readily quantifiable. This shows that monetization of ecosystem services should also be accompanied by qualitative assessment of other benefits.

<sup>7</sup>Results are somewhat dependent on the fact that the water quantity ecosystem service is a benefit appearing in all projects (as this is the main goal of our water replenishment programme), while other ecosystem services are more context-dependent. For Pilot 7 in the graphic above, only carbon sequestration benefits are currently accounted for.

# What about biodiversity?

**Biodiversity underpins natural capital** – human activities fundamentally rely on goods and services that are contributed and regulated by biodiversity, including food, clear water, climate mitigation, and cultural connections. At the same time, biodiversity is under severe pressure and decline – on average, global populations of mammals, birds, amphibians, reptiles and fish have declined by 68% over the last 50 years. 75% of the Earth’s ice-free land is now significantly altered, freshwater ecosystems face multiple threats, and 85% of global wetland area has been lost<sup>8</sup>.

While some attempt may be made to quantify the value of biodiversity, understanding the links between biodiversity and derived benefits is at present considered limited due to both lack of data and the intrinsic complexity of the matter. What is more, at least some level of biodiversity can be considered irreplaceable – as biodiversity underpins ecosystem services, changes beyond certain critical threshold would also alter service provision. The impacts of such changes may be severe, unpredictable and/or irreversible, and even if benefits from biodiversity at present may be valued, the value of biodiversity as providing “insurance” (or option value) against shocks and changes would still be missed<sup>9</sup>.

As part of the development of our methodology for ecosystem service valuation for replenishment projects, we piloted various methods for monetization of biodiversity benefits stemming from water replenishment. We have found that the estimated value of biodiversity can be substantial, but extremely uncertain. We view this as a significant limitation that at present does not allow for drawing decision-relevant information from such estimates.

As is the spirit of our ecosystem services valuation methodology in general, good and comparable valuation requires good and comparable data for ecosystem improvements on-the-ground. At present, our water replenishment programme does not systematically collect data on biodiversity improvements from our projects. Our project partners do often report such data for better framing their projects’ achievements, but the challenge remains of collecting this data in a way that adheres to the guiding principles of our method – relevance, rigour, replicability, consistency (as per the Natural Capital Protocol).

The Capitals Coalition has recently published additional guidelines for integrating biodiversity in natural capital assessments<sup>10</sup>. Our water replenishment programme is based on partnerships with some of the world’s leading conservation organisations. This places us in a unique position with regards to biodiversity management going forward. In light of the recommendations of the Capitals Coalition, we intend to explore the development of a standardised method for collecting decision-relevant biodiversity information. This can include information on:

- Quantity of habitats of different types impacted by replenishment projects
- Quality of habitats – how the land uses impacted by our projects have improved compared to a baseline. This relates to not just “land” as terrestrial habitat, but also water quantity and quality as determinants of habitat availability.
- State of species – data on changes in abundance of species at project sites (at least for key species, such as those included in the IUCN Red List). This should be supplemented with data on whether changes in diversity have been observed, such as reappearance of species that have previously been absent due to habitat deterioration.

Our aim, as with the rest of our natural capital methodology, is to assist project partners toward a common goal, leaving nature in a state better than the one we found it in, and in so doing, building adaptation and resilience into our key sourcing and operating watersheds.



<sup>8</sup> WWF Living Planet Report 2020

<sup>9</sup> These limitations have been echoed multiple times in the Natural Capital community, e.g. by the Cambridge Conservation Initiative’s report Biodiversity at the heart of accounting for natural capital: the key to credibility (2016)

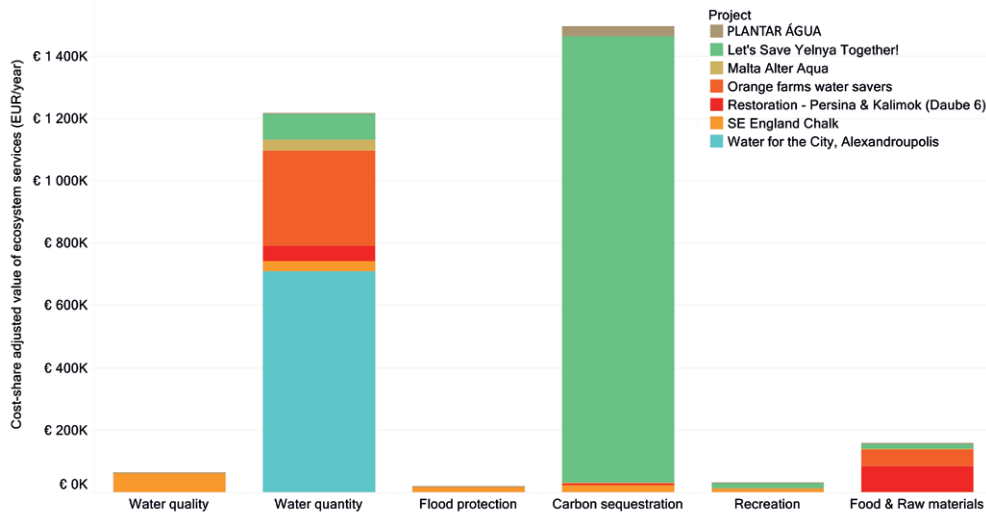
<sup>10</sup> See at <https://naturalcapitalcoalition.org/biodiversity/>

# What did we learn?

## Benefits from different types of projects

**Wetlands** provide a wide variety of ecosystem services – these vary depending on the local context and state, as well as based on ecosystem improvement achieved. Their benefit can be substantial. Wetland projects in particular seem an easy win in terms of environmental improvements, but their diversity demands **meaningful and accurate data collection**. This applies especially to **carbon sequestration benefits**, where on-the-ground data can do much to improve confidence in results. The large and varied benefits of wetlands make them a quintessential example for what nature-based solutions can offer.

For **projects in urban settings**, water pollution prevention can have benefits potentially even larger than the benefits from use of replenished water itself. Simply put, urban settings provide plenty of pollution to be treated. It is likely that this would also apply to projects mitigating agricultural runoff. What is more, enhancing nature in urban environments has the dual purpose of increasing recreational opportunities and well-being, the benefits of this should be understated<sup>11</sup>.



<sup>11</sup> Nearly 30 years ago, in his memoir “The Thunder Tree”, American naturalist and writer Robert M Pyle coined the term “extinction of experience”, referring to the phenomenon of urbanization reducing everyday human-nature interactions. Today, it is well-recognized that such an alienation from the natural world can have important and detrimental effects on public health, attitudes, and emotional well-being. See for example: Ives, C.D., et al., 2018. Reconnecting with nature for sustainability. Sustainability science, 13(5), pp.1389-1397.

## WASH & farming projects:

Water savings can deliver substantial benefits where water scarcity is high and the ratio of replenished water to financial investment is high. Investing in agricultural water efficiency can have dual benefits for both nature and for cost savings for farmers. This added resilience is strongly important, given increasing pressures on water resources toward the future.

## Benefits from different types of ecosystem services

Looking into individual ecosystem service benefits can yield additional insights. Within the 7 pilot projects we have assessed, **water quantity and carbon sequestration** generate the largest benefits. This reaffirms the value of our replenishment work for building resilience, especially in the face of future climate change.

**Food & raw materials benefits** can be large where there is a strong local dependence on a particular food or material source, such as for supplementing local incomes or for subsistence. This is important, as such benefits are directly accrued by the communities in which we operate.

Projects that provide improvements for **recreational & educational** value have greater value the nearer they are to denser population centres, as there are more users who can benefit. This also suggests that much can be gained by improving not just the attractiveness, but also the accessibility of natural retreats.

**Benefits on biodiversity** can be substantial – water replenishment projects can bring huge benefits by restoring the naturalness of water bodies and their surrounding ecosystems. These benefits should be monitored on the ground in order to be able to glean systematic insights into the multi-faceted value that biodiversity improvements bring.

**Non-quantifiable benefits** Finally, it is important to understand that not all potentially relevant benefits can necessarily be monetized. Biodiversity is one such example, but this also applies strongly to projects that focus on capacity building and awareness. The ripple effects of such projects may be substantial, which is why tracking non-monetized indicators and reviewing these in-line with economic performance is necessary. This also applies to other Social Capital benefits, though for some (such as upskilling and gender equality), we plan to explore potential options for monetization in the future.

Going  
forward

# Going forward

Our methodology for assessing the Natural Capital benefits of water replenishment projects will help us in building a truly comprehensive understanding of the value of nature restoration for both our business and the communities in which we operate. However, it is far from being the final answer – it is much more so a starting point for a wider discussion that helps others inside and outside our direct business system. We will continue to work on Natural Capital / Nature-Based Solutions (NBS) both at the local and the global level, by engaging with our partners and other stakeholders interested in advancing the dialogue.

## Specifically, we plan the following steps for the next 18 months (2021 till mid 2022)

- Using the results of our natural capital assessment to shape the future of Coca-Cola's water replenishment programme, including aligning with and driving the direction of **Coca-Cola's updated Water Strategy 2030 with all partners and key players involved.**
- **Testing and piloting our methodology outside of Europe.** We plan to extend our natural capital work to our business units globally, in order to assess its usefulness and robustness in new and different contexts, and also to explore additional areas where our methods may need to be expanded or adapted. This includes also valuation of social capital benefits.
- **Working on Biodiversity.** The value of biodiversity from our water replenishment work cannot be understated. However, we have much to do in order to systematically account for such benefits in a decision-relevant way. We aim to use the newly released **Biodiversity Guidance to the Natural Capital Protocol** to start building a systematic framework for measuring and reporting the biodiversity benefits of replenishment projects.
- **Developing a Natural Capital Toolkit.** Measuring, valuing and reporting natural capital benefits is an important, but often time-consuming endeavor. We wish to make our natural capital methodology readily accessible by developing a dedicated toolkit for its implementation. This would significantly reduce technical barriers and allow us to drive natural capital work at scale.
- **Working with the CEO Water Mandate.** We aim for our natural capital accounting methodology to feed into the CEO Water Mandate's ongoing initiative for Benefit Accounting of Nature-Based Solutions for Watersheds. This initiative aims to develop a standardized guide, method and tool for accounting of stacked water, carbon and biodiversity benefits, and identify wider co-benefits of nature-based solutions (NBS) for watersheds.
- **Continue the discussion.** In order for Natural Capital and nature-based solutions to become the norm, the topic of accounting for nature's benefits needs to be pushed further into the mainstream. Much work on this is ongoing<sup>12</sup>. We aim to contribute not just by continuing to engage with such initiatives, but also through using our influence to attract companies and investors to the discussion.

We have learned much since our water replenishment programme's inception in 2007. We have replenished approximately 192 billion litres of water annually, through nearly 250 nature restoration and community development projects worldwide, each bringing varied additional ecosystem service benefits.

Since then, the world has seen global CO<sub>2</sub> concentrations reach record highs, global freshwater ecosystem continue to face a multitude of pressures and increasing urbanization and biodiversity loss increasingly alienate the world from nature. Of course, global development continues to bring an increasing quality of life globally and we should not underestimate this. If 2020 and the global COVID-19 pandemic have taught us one thing, it is that global development cannot discount biodiversity. In the aftermath of 2020, we are also presented with an unique opportunity to build back better – toward a state-of-play where care of economic, natural, social and human capitals together and on equal grounds is the new normal<sup>13</sup>.

Our water replenishment work has so far focused on just that – restoring water. We believe that in light of the growing importance of biodiversity, replenishment can achieve much more. A systematic view of natural capital in the same way as for replenished water volumes will allow us to better manage our restoration work toward maximizing societal benefits in addition to replenished water. Valuation of natural capital will allow for building a more compelling business case for nature both internally and externally - with our project partners, communities and key stakeholders, as well as with our supplier and our peer companies.

Ultimately, better understanding of Capitals will help us better steer business decisions toward more impactful interventions – such where water replenishment projects truly serve as nature-based solutions for building business resilience and contributing to solving complex socio-environmental challenges. What is more, with 13 years of experience and over 250 successful projects, we can contribute much to the wider discussion on Nature Based Solutions. Further still, as one of the most well-recognised brands in the world, we can use our influence to engage companies and investors to also take part. This way, we will continue to build the understanding of how to make enhancing the co-benefits of nature the business norm.

**We are committed to help lead the change and welcome the opportunity for further conversation and potential partnerships going forward.**

<sup>12</sup> See for example IUCN's Global Standard for Nature-Based Solutions, launched in July 2020: <https://www.iucn.org/theme/nature-based-solutions/resources/iucn-global-standard-nbs>

<sup>13</sup> For a recent review of the importance of biodiversity and natural capital, see Dasgupta, P. (2021), *The Economics of Biodiversity: The Dasgupta Review*. (London: HM Treasury)

### Project description:

Chalk (white soft limestone) defines much of the landscape and water resources of South East England, both surface and groundwater. Much of the water resources and their associated natural environments are under stress due to high abstraction and pollution. We have conducted three projects across this region, led by The Rivers Trust, in association with WWF-UK and other local partners. These projects include:

- **Broomfield Park** - constructing a 0.3 ha wetland in a small urban park in the London borough of Enfield, filtering urban runoff, ameliorating flood risk, and providing improved biodiversity and recreational opportunities.
- **Downstream Defender**<sup>®</sup> - installing a sediment and pollution filtration device for filtering urban runoff on the Beverley Brook - a 14 km river in southwest London, flowing into the River Thames.
- **Ham Fen** - rewetting of the last remaining ancient fenland in Kent through restoring natural flow conditions and protecting a unique habitat for rare plant and animal species. Use of the site as a natural laboratory and teaching space by Canterbury Christ Church University.

### Interpretation of results:

The three sub-projects each bring unique benefits in their local contexts. Together, they make available 286 megalitres of water per year for potential human use. However, only 5% of the total available water in the Thames catchment is abstracted, which makes the monetized value to people in this case lower compared to projects in more water-stressed areas.

Water quality benefits for this project outweigh all other benefits. This is not necessarily surprising, as urban catchments are often under severe stress from pollution. The Downstream Defender sub-project is particularly strong in this regard, as this is its function by design.

Rewetting of Ham Fen brings approx. ~232 tCO<sub>2</sub>-eq/year<sup>14</sup> of carbon sequestration benefits, while the Broomfield Park wetland provides larger flood protection benefits, due to being in a more dense urban area (~110 properties benefit from reduced floor risk across sub-projects). In terms of recreation & education benefits, Ham Fen provides primarily educational benefits (as it is generally closed for public access, except for university research students), while Broomfield park provides primarily recreational benefits (as it is located in a dense urban area).

### Project key achievements

- Water replenished: 268 ML/year
- Water purification: Reduction of pollution for N, P, Al, Zn, Pb, Cu
- C sequestration: ~232 tCO<sub>2</sub>-eq/year
- Properties with reduced flood risk: 110
- Additional visitors: ~1,700/year
- Improvement in educational value: Minor (primarily in Ham Fen)
- Improvement in scenic quality: Minor (primarily in Broomfield park)
- Biodiversity benefits: Minor, apart from Ham Fen, which is a locally-unique ecosystem, supporting locally-unique species such as beavers

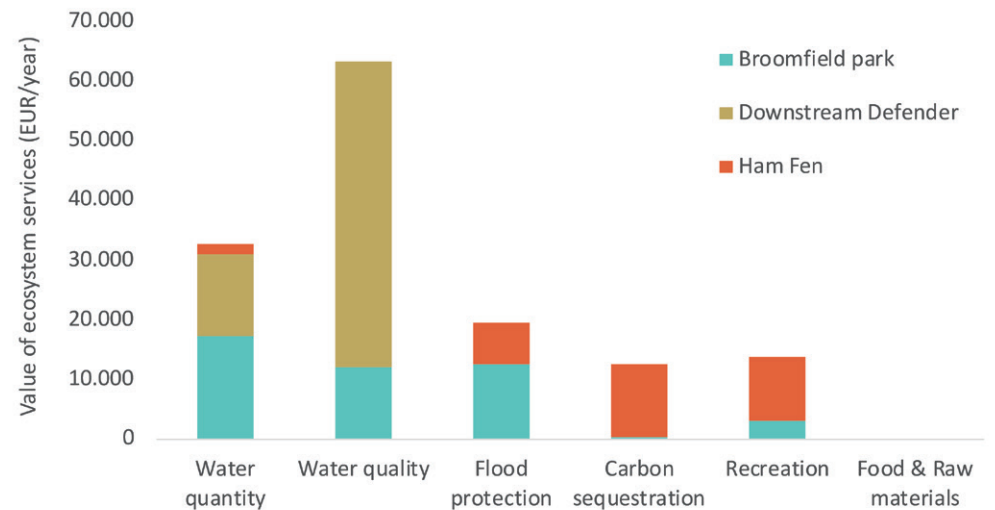
**Total TCCC investment**  
399,500 EUR

**Total ecosystem services value per year**  
141,200 EUR/year

**Project payback time**  
~2.8 years

**Total value of ES after 10 years**  
1,421,000 EUR

**Total investment multiplier after 10 years**  
3.65



<sup>14</sup> Based on our default IPCC Tier 1 methodology. Project partners estimate 103 tCO<sub>2</sub>-eq/year via local measurements. This illustrates the benefit of measuring carbon sequestration on-the-ground where practicable. Our methodology recommends this but does not mandate it, as it may not always be practical or cost-efficient in all project contexts.

# Pilot 2 Wetland restoration in Bulgaria

## Project description:

This project concerned restoring the natural flow regime of two Natura 2000 Danube wetlands - Persina and Kalimok, both located in Bulgaria. Under natural conditions, these wetlands are flooded annually, with surface water remaining until late summer.

Due to human modifications of the land and river level regime, sluices are now required to keep the wetland regime resembling its natural state, which have been in place since 2010 but their effective operation has been hindered due to their remoteness. The main issue for this has been the physical difficulty of manual operation, as well as the absence of accurate water level monitoring systems. The project concerned installation of an innovative automated sluice monitoring and operation system, which allows for reliable maintenance of the natural wetland flow regime.

The project was led by WWF Bulgaria, in close cooperation with the Persina Nature Park Directorate, and the Rusenski Lom Nature Park Directorate. Monitoring of results continues on-the-ground.

## Interpretation of results:

The project led to the provision of a substantial 7,387 ML/year of water for human use, though a relatively modest water quantity value. This is due to 98% of water in the catchment is used for cooling in industry, which in Bulgaria has a very low price, even when accounting for water scarcity.

However, the project contributed to the enhancement of carp nursery habitat, supporting over 82,000 additional adult carp landings for local fishermen<sup>15</sup> – a significant supplementary source of income in an economically-challenged region.

Finally, while a substantial amount of water has been replenished, CO<sub>2</sub>-eq. sequestration benefits are modest. While wetland rewetting brings CO<sub>2</sub> storage benefits, it also leads to methane emissions. Such trade-offs should ideally be assessed at the pre-project stage in order to optimize restoration toward maximum sequestration benefits.

### Project key achievements

- Water replenished: 7,387 ML/year
- C sequestration: ~123 tCO<sub>2</sub>-eq/year (1.45 tC/ha/year)
- Additional carp landings for fishermen: 82,000
- Additional visitors: Not estimated, likely small
- Capacity building and innovation: Major change
- Employment benefits: Minor change
- Biodiversity benefits: Significant, as both wetlands are habitats for a wide variety of waterfowl. Additionally, benefits expected for both fish and mollusk species.

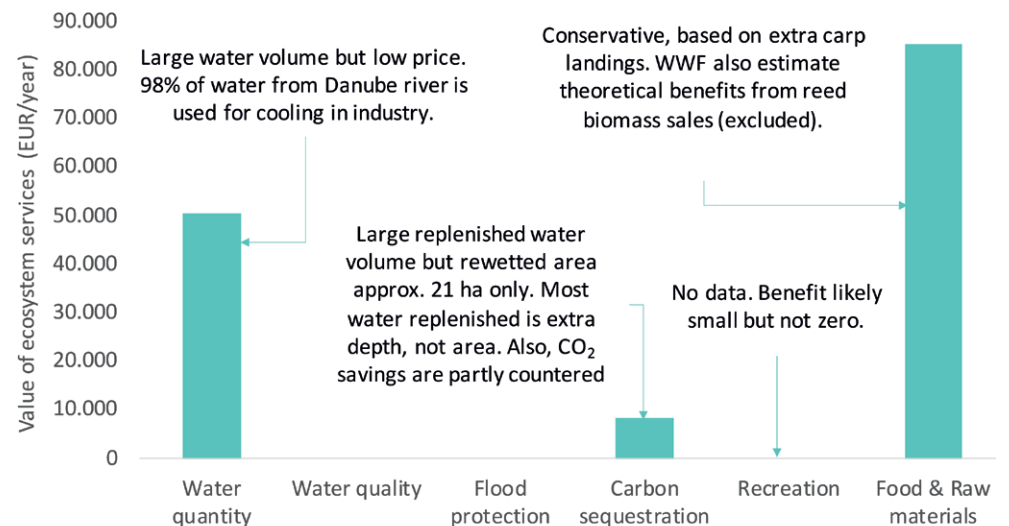
**Total TCCC investment**  
382,500 EUR

**Total ecosystem services value per year**  
142,100 EUR/year

**Project payback time**  
~2.69 years

**Total value of ES after 10 years**  
1,421,000 EUR

**Total investment multiplier after 10 years**  
3.76



<sup>15</sup> Based on local studies, project partners estimate that wetland restoration provides nursery habitat for ~410,000 carp fishings. 20% of these are estimated as reaching maturity and caught by fishermen. Fishermen's profit margin is estimated at 15% (Mihov, 2020).

### Project description:

The project concerned the restoration of the Yelnya bog – the 5th largest bog in Europe, a designated Nature Preserve, an Important Bird Area (IBA), and a Ramsar territory.

Irrigation canals constructed in the early 20th century (now no longer used) caused a significant drop in Yelnya’s groundwater table, resulting in annual peat fires that significantly degraded vegetative cover and habitat for birds and other fauna. Beginning in 2007, Coca-Cola Beverages Belorussiya, in Partnership with APB-Birdlife Belarus, organized volunteer teams to manually construct dams out of damaged trees and peat material to block existing irrigation canals.

This resulted in the raising of groundwater levels by 1 meter over 14,000 ha of bog, leading to a significant reduction in annual destructive fires, allowing the development of the reserve as an attractive tourist area over the last 10 years.

### Interpretation of results:

The project led to 10,900 ML/year<sup>16</sup> of water made available – a colossal figure, dwarfing all other replenishment projects to date. The overall water quantity value, while large, is tempered by the fact that less than 5% of water in the catchment is abstracted for human use.

The largest benefits from the project by far are due to carbon sequestration. Rewetting 14,000 ha of previously severely degraded habitat ensures that substantial amounts of carbon remain locked in the ground, even when subtracting methane emissions.

Restoring the Yelnya bog also allowed for the reserve to be developed as an attractive tourist destination, now bringing over 1,500 visitors annually, both locally and from abroad. Finally, berry harvest is a traditional source of income in the area. The project has led to over 7 tonnes/year of berries made available for harvest<sup>16</sup>.

### Project key achievements

- Water replenished: 10,903 ML/year
- C sequestration: ~21,100 tCO<sub>2</sub>-eq/year (0.41 tC/ha/year)
- Additional berry harvest for local people: 7 t/year
- Additional visitors: 1,500/year
- Fire risk reduction: Major change (much reduced peat fires)
- Improvement in educational value: Minor change
- Scenic quality: Significant habitat recovery with fire cessation
- Biodiversity benefits: Substantial benefits, the site provides habitat for 98 bird species (incl. 23 endangered), and 11 endangered plant species.

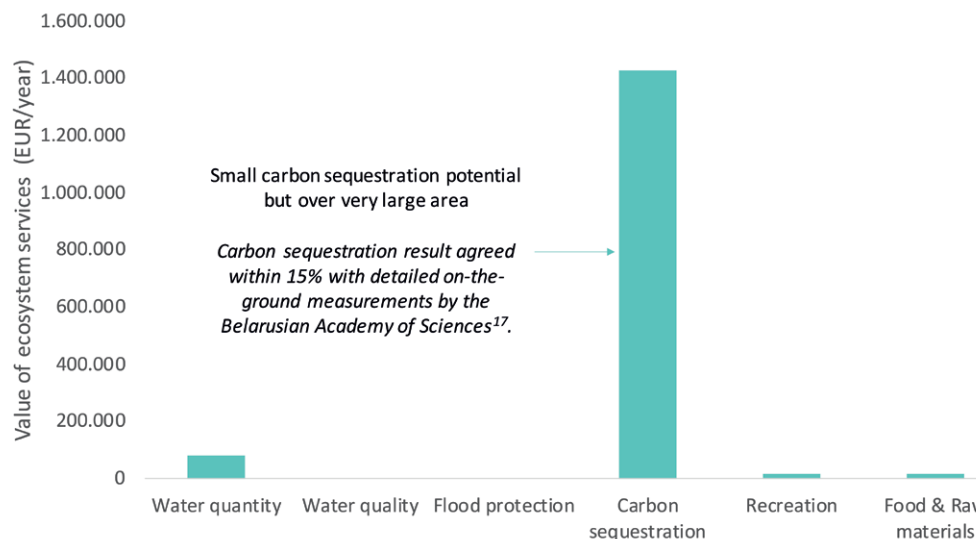
**Total TCCC investment**  
297,500 EUR

**Total ecosystem services value per year**  
1,046,500 EUR/year

**Project payback time**  
~0.3 years (approx. 4 months)

**Total value of ES after 10 years**  
10,465,000 EUR

**Total investment multiplier after 10 years**  
35



<sup>16</sup> The actual replenished volume is 140,000 ML/year. This is capped at 10,900 ML/year, which is the maximum water volume used by our CEE business unit.

<sup>17</sup> Based on local data from Puchilo, A.V. et al. (2015). Research report: Monitoring of the state of plant communities and groundwater levels of the Yelnya bog prior to activities toward optimization of its hydrological regime [Original report in Russian].



### Project description:

Spain is one of the driest countries in Europe, and Valencia region one of the most critical water-stressed regions. Citrus farming is a significant user of water, but also important to the local economy.

The project focused on working with nearly 40 citrus farms (over 750 ha) to reduce water use while maintaining crop yields. This was achieved via investment in improved irrigation and monitoring equipment, as well as trainings for farmers, which allowed for efficient management of water use over the growing season.

The project was led by three partners - Inèdit Innovació SL, the Catalan Institute of Agrifood Research and Technology (IRTA), as well as Jaume I University.

### Interpretation of results:

In total, the project resulted in 506 ML/year of water savings, for which the value of water quantity in monetary terms is substantial, due to the fact that the Valencia region is strongly water stressed.

These water savings brought tangible benefits for the farmers themselves as well. This was in the form of savings on water costs, as well as associated costs for pumping. What is more, the project managed to achieve an increase in yields by 11% on average, due to more efficient utilization of water if and when it was most needed by crops<sup>18</sup>.

Savings on water pumping also meant reduced energy use (in this case diesel fuel), which had measurable benefits of avoided greenhouse gas emissions.

### Project key achievements

- Water replenished: 506 ML/year
- C sequestration: 131 tCO<sub>2</sub>-eq/year (~431,000 kWh/year savings)
- Crop yield improvement: 30 t/year
- Avoidance of aquifer salt intrusion: Minor change

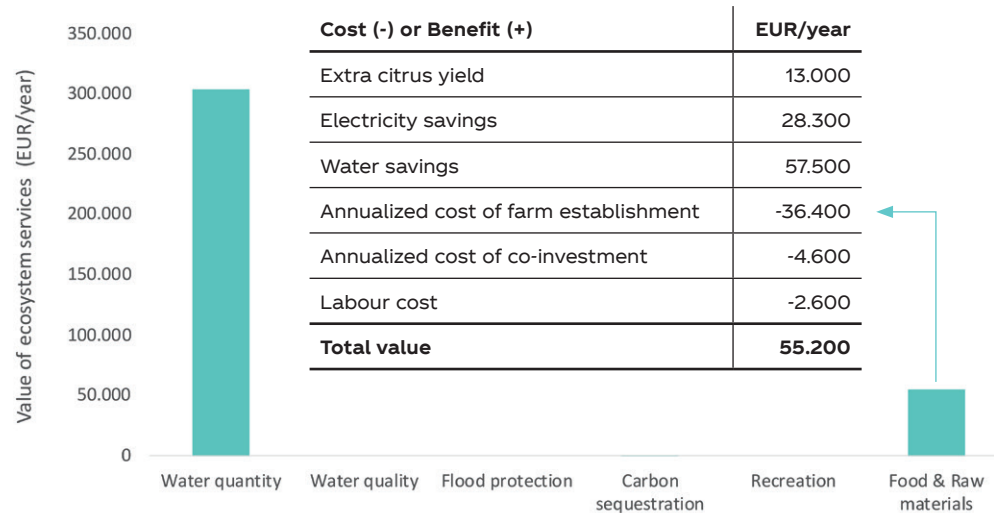
**Total TCCC investment**  
445,868 EUR

**Total ecosystem services value per year**  
360,600 EUR/year

**Project payback time**  
~1.24 years

**Total value of ES after 10 years**  
3,606,000 EUR

**Total investment multiplier after 10 years**  
8.09



<sup>18</sup> This was established by project partners by conducting a controlled experiment, comparing areas of farms receiving project benefits, to such that did not receive these benefits (so-called "control" areas, reflecting the pre-project baseline).

### Project description:

The “Alter Aqua” project involved the installation and repair of non-conventional water resource (NCWR) systems in selected public buildings and areas, with special focus on schools. 17 such NCWR systems were installed or reinstalled.

These included systems for rainwater harvesting and distribution, as well as gray water recycling, for purposes such as toilet flushing and garden use.

Activities also included hands-on lessons in schools, teacher training seminars, capacity-building workshops for local authorities and trainings for local technicians, as well as awareness raising on NCWR and sustainable water use.

The project was designed and implemented by the Global Water Partnership – Mediterranean (GWP-Med), in partnership with the Ministry for Gozo, the Energy and Water Agency of the Maltese Ministry of Energy and Water Resources, and the Coca-Cola System in Malta.

### Interpretation of results:

The project brought about 17.9 ML/year of non-conventional water resources, made available for human use. The project can also be expected to have generated benefits in terms of energy savings from avoiding primary water consumption, plus associated emissions savings.

In aggregate, monetized ecosystem service benefits are small compared to overall project investment. At first glance, this may lead to the conclusion that the project has not been successful. But this is far from the case. The project’s primary purpose was to showcase the potential of NCWR for increasing local water budgets and climate resilience. As such, it included a substantial capacity building, educational and outreach component, and directly affected national water policies, assisting in the inclusion of NCWR in the Maltese National Water Management Plan. Results were also presented as best practice in multiple international fora, and received multiple distinctions in the global water community for their replication and scaling potential.

This project perfectly illustrates that monetized ecosystem service benefits should always be supplemented with additional qualitative data collection, in order to truly understand benefits in a holistic way.

### Project key achievements

- Water replenished: 17.9 ML/year
- C sequestration: Implied but not estimated
- Energy & financial savings: Implied but not estimated
- Educational value: 1,378 teachers trained (100 planned initially), 17,656 students reached
- Capacity building & innovation: 56 technicians trained in NCWR engineering aspects (25 planned initially)

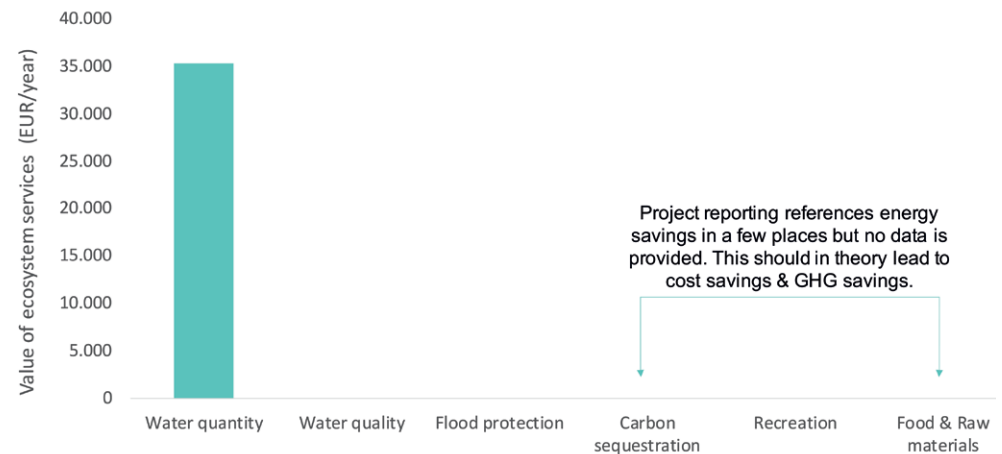
**Total TCCC investment**  
1,063,010 EUR

**Total ecosystem services value per year**  
35,400 EUR/year

**Project payback time**  
~30 years

**Total value of ES after 10 years**  
354,000 EUR

**Total investment multiplier after 10 years**  
0.33



### Project description:

Alexandroupolis is a coastal city in North-eastern Greece, with a permanent population of 85,000 inhabitants, and approximately 110,000 people in the summer months. The city is supplied with water mainly from the local Dipotamos dam, which due to outdated design, frequently overflows and leads to approximate water losses of 35,000 megalitres per year. In addition, local water needs are supplemented with water from groundwater aquifers, which due to overabstraction has led to salinization in the coastal zone.

Due to the risk of salinization and high energy costs of pumping, the local water utility operator identified improving the dam's storage capacity as the most feasible solution. This was achieved through "Water for the City" - a project designed by the Global Water Partnership - Mediterranean (GWP), together with the Municipality and Water Utility of Alexandroupolis, and the Coca-Cola system in Greece, supported by Coca-Cola Foundation grants.

"Water for the City" also implemented a further technical solution for improving water efficiency in a remote water supply network. Beyond the technical solutions, the project also included a significant educational and capacity building programme, aimed at promoting sustainable water use in the urban environment. Amongst other means, this included a "serious game" - an innovative stakeholder engagement tool, developed for the project.

### Interpretation of results:

Installation of a 1.6 meter-high gate system on the main dam spillway allowed for retaining a larger amount of water during high flow periods, leading to water savings of 1,700 megalitres per year. Accounting for extremely high<sup>19</sup> water stress, the ecosystem service benefit of increased water quantity provisioning was valued at over 700,000 EUR/year. This is likely a conservative estimate as it is based on average Greek values for water use distribution between sectors, which attributes only 4% water use to households (where water tariffs are highest), while we can expect this to be much higher given that the Dipotamos dam is primarily used to meet urban water supply. We can also expect that the project has led to cost, energy and emissions savings from avoided groundwater pumping but this has not been quantified due to lack of data.

One of the prime deliverables of the "Water for the City" capacity building efforts was a "serious game" on integrated urban water management - an innovative tool for stakeholder engagement. Furthermore, a complementary educational programme was designed, including hands-on lessons in local schools for 5,600 students, and in-class training for 400 local teachers. Additionally, the on-line educational platform "Water-polis" was developed, which is now used by ~300 educators on a monthly basis, reaching thousands of students all over the country. The project's legacy continues through the support of the Municipality of Alexandroupolis and the local water utility.

### Project key achievements

- Water replenished: 1,700 ML/year
- C sequestration: Implied but not estimated
- Energy & financial savings: Implied but not estimated
- Educational value: teachers trained, 5,600 students reached
- Capacity building & innovation: Presented as best practice in multiple international fora

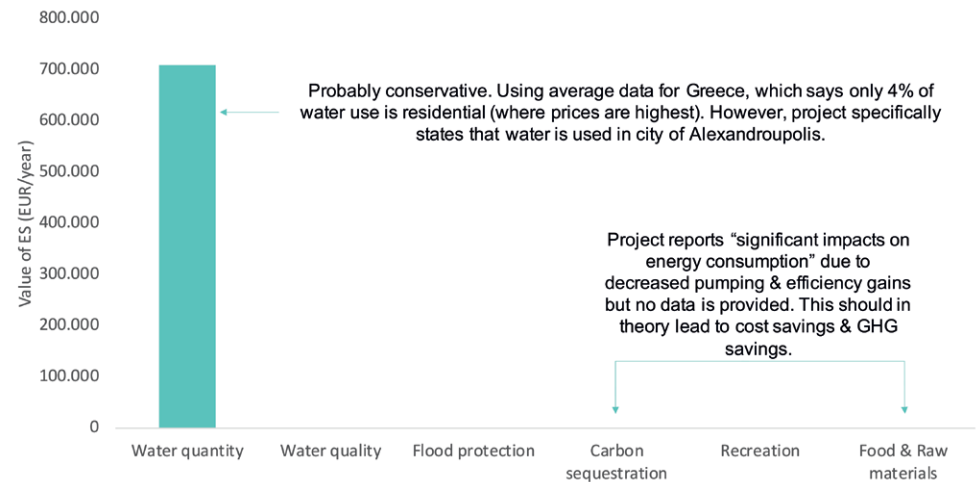
**Total TCCC investment**  
1,025,100 EUR

**Total ecosystem services value per year**  
709,900 EUR/year

**Project payback time**  
~1.44 years

**Total value of ES after 10 years**  
7,099,000 EUR

**Total investment multiplier after 10 years**  
6.93



<sup>19</sup> "Extremely high" baseline water stress, as estimated by the Aqeduct tool (World Resources Institute). Aqeduct is used for water quantity scarcity correction in all projects.

### Project description:

PLANTAR ÁGUA (Portuguese for “planting water”) is a project for restoring 100 ha of indigenous Mediterranean tree (particularly cork) and shrub forest ecosystem. While forest fires are a natural part of Mediterranean ecosystems, replacement of natural ecosystems with monocultures and stronger climate extremes have led to increasing local wildfire severity. In 2017 Portugal saw the burning of over 500,000 ha of land, leading to the loss of 112 human lives and significant economic losses.

The PLANTAR ÁGUA project is expected to commence in 2021, and will build on research of best practices for Mediterranean forestry restoration toward stronger fire resilience, based on results of previous projects conducted in 2007-2011.

We have piloted our carbon sequestration valuation method for land restoration projects by conducting a forward-looking estimate of forest carbon benefits. This is based on the IPCC’s Tier 1 methodology for forest carbon accounting, and takes into account both carbon gains and losses that may occur during restoration<sup>20</sup>.

### Interpretation of results:

Based on our methodology, we estimate that the project would bring a total of ~13,700 tonnes of CO<sub>2</sub>-eq sequestration once its afforested area reaches maturity. This equates to sequestration of ~460 tCO<sub>2</sub>-eq/year.

Accounting for the net benefits for carbon from forestry projects requires taking into account not just carbon gains (stored in vegetation), but also potential carbon losses. In PLANTAR ÁGUA’s case, 20% of conifers planted in the project are expected to be harvested for timber annually, meaning that this vegetation is no longer available for storing carbon. Planted cork trees are also expected to be harvested, but for cork, this does not involve tree removal (only the tree bark is harvested). Finally, forest restoration can often occur on lands that are used for grazing. Grazing animals emit methane due to enteric fermentation, which needs to be accounted for. In PLANTAR ÁGUA’s case, this effect is small as the site is only populated by wild grazers (such as deer and boar, emissions from which are relatively minor). This would however not be the case if project land was for example used for grazing by cattle.

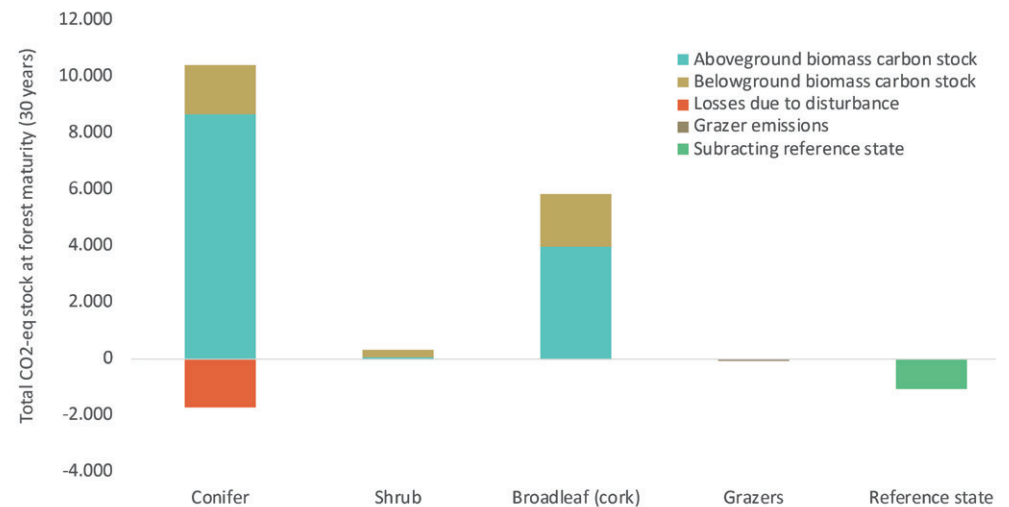
### Project key achievements

- Water replenished: Not estimated, project has not yet started
- C sequestration: 460 tCO<sub>2</sub>-eq/year (forward-looking estimate)
- Additional expected benefits: Economic gains from timber and cork sales, increased harvest of Arbutus Uneda (used in certified brandy), reduced soil erosion, improved habitat for species

**Total TCCC investment**  
279,681 EUR

**Total ecosystem services value per year**  
22,700 for CO<sub>2</sub> sequestration (not adjusted)

**Project payback time**  
12.32 for CO<sub>2</sub>-seq. (assuming 100% cost share)



<sup>20</sup> Our default methodology current excludes carbon stock changes for dead wood and soil organic matter, as for these IPCC Tier 1 guidelines do not provide default values. Our methodology recommends that project partners budget in more detailed assessments (such as based on allometric equations) where this is practicable, especially where results are intended for use in corporate GHG reporting.

# Critical Review

The project has undergone two independent critical reviews from acknowledged external specialists in the field of Natural Capital and Ecosystem Service – eftec and Sustain Value. The review focused on the ecosystem services valuation methods based on the systematic approach recommended by the Natural Capital Protocol. Results, issues addressed, recommendations and conclusions are summarized in the following table.

## Strengths

- The methodology strikes a good balance between comprehensiveness, detail and ease of application
- Materiality is good and clearly laid out
- There is good linking of data on physical environment, socio-economic context and environmental impacts

## Issues addressed within the review process

- Distinction between stocks and flows of assets
- Noting forward-looking perspectives
- Sensitivity analysis - confidence on results
- Clearly setting baselines for calculations
- More prominence to biodiversity impacts and measurement

## Recommendations for further development

- Further work on stocks of natural capital impacts and use of forward-looking timeframe
- Links to Social Capital
- Include guidance for those undertaking the assessments as to how they should best include a sensitivity analysis component for each item

## Conclusions

- The analysis and results can be used for their intended purpose – they help inform understanding of the wider impacts of the water projects across Europe.
- The complexity of types of projects spread across Europe is challenging for this type of appraisal. For the level of detail and effort available, the results give a good assessment of the overall impacts of the water replenishment program.



# Acknowledgements

**This report is a product of cooperation between partners.**

The Coca-Cola project team was formed by Therese Noorlander, Sofia Kilifi and Susana Pliego. We would like to thank our partners and colleagues who provided us with invaluable data and expertise.

- **Coca-Cola project team support:** Ulrike Sapiro, Liz Lowe, Wouter Vermeulen, Yui Kamikawa
- **denkstatt project team:** Ivan Paspaldzhiev, Fatima Bertran De Lis, Willibald Kaltenbrunner, Gustav Voith
- **Easton Consulting:** Peter Easton
- **Critical reviewers:** Ian Dickie (eftec), James Spurgeon (Sustain Value)

**We would also like to thank our project implementation partners who helped make this report possible:**

- **APB-Birdlife Belarus**
- **Catalan Institute of Agrifood Research and Technology (IRTA)**
- **Global Water Partnership – Mediterranean**
- **Inèdit Innovació SL**
- **Jaume I University**
- **ANP | WWF (Portugal)**
- **The Rivers Trust**
- **WWF UK**
- **WWF Bulgaria**
- **WWF CEE**

THE *Coca-Cola* COMPANY

In partnership with



THE  
*Coca-Cola*  
COMPANY

In partnership with

