



Natural Capital Accounting

The Coca-Cola Water Replenishment Program



Introduction

As the world's largest beverage company, The Coca-Cola Company (TCCC) has a special responsibility to protect water resources and provide leadership on water stewardship. This is why in 2007, the Company set an ambitious global water stewardship target that involves protecting the water sources supplying its bottling plants worldwide, reducing water use at production sites, treating all process water and returning it to the environment in a clean state, as well as replenishing all of its product-related water use by 2020, with a view to becoming 'water-neutral'. This means returning about 162 billion liters of water to the environment each year by engaging in over 250 local community water projects worldwide. Each project is designed to meet specific water resource and provisioning objectives, such as providing or improving access to safe water and sanitation, protecting watersheds, supporting water conservation and raising awareness of critical local water-related issues. In 2015, the Company announced that it was close to achieving its goal of replenishing its global water use five years early.

Apart from enhancing water resources for communities and the environment, interventions in freshwater ecosystems – rivers, lakes and wetlands – provide additional ecosystem services to humanity, for example by providing water for drinking, sanitation, food production and agriculture, transport, electricity generation, culture and recreation.

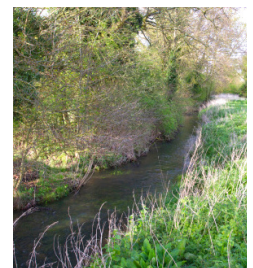
As the Company is seeking to enhance its water stewardship programs, it recognizes the importance of measuring the broader value of water replenishment and conservation projects in supporting Natural Capital, e.g. by enhancing ecosystem services. By quantifying and measuring these ecosystem service benefits, The Coca-Cola Company expected to better capture and communicate project impacts beyond replenishment, to manage project outcomes that are providing optimized replenishment and ecosystem benefits, and to help drive future investment in more beneficial interventions.

This requires a concept that goes beyond captured volumes of water and assesses the additional ecosystem benefits of water replenishment projects, such as water regulation and treatment, improved habitats for water birds and aquatic species, flood protection for communities, tourism, and education.

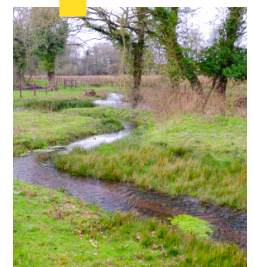
However, the methodology for these evaluations is still in its infancy. So The Coca-Cola Company Western Europe collaborated with denkstatt, an expert consultancy, to develop a methodology and a practical tool for quantifying the intervention's value to the ecosystem, and to compare eight leading European replenishment projects on the basis of their overall ecosystem service benefits.

This work has also been submitted to the Natural Capital Coalition protocol pilot project, where both Coca-Cola and denkstatt are global partners.

Example of a project before and after intervention:



The old ditch was completely straight and entrenched over a meter into the floodplain.



The new stream crosses the line of the old ditch, but is one meter higher, looks like a stream again and has been reconnected with a functioning floodplain.

The concept of Natural Capital

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. By enabling "apple-to-apple" comparisons, it closes two gaps at once:

a| between different ecological metrics; and
b| between ecological and monetary terms

NC accounting involves two basic steps. The first is estimating the impact on ecosystem quality or functions. All ecosystems have certain functions – biological, geochemical and physical processes and components that take place or occur within an ecosystem. A project can deliver measurable or assessable improvements in many different ecosystem functions.

Additionally, these functions deliver benefits to people. In economic terms, we can call them "services". Typical examples are: food, water and timber obtained from ecosystems; climate regulation through the uptake of carbon; selfpurification of air and water bodies through the activity of trees and microbes; habitat provision for wildlife; and opportunities for recreation.

We can express their contribution to human well-being in financial terms using metrics such as net present value and a project's return on investment. Evaluating net project impacts using economic metrics could allow TCCC to communicate the total value creation from replenishment projects more easily internally and externally, as well as help-

ing managers to evaluate and choose from different project alternatives and form new partnerships.

In a nutshell, the concept of Natural Capital offers a new opportunity to evaluate projects and inform business and investment decisions. To put the concept into action, a global coalition of organizations has drafted the NC Protocol, a standard approach to help businesses generate timely, trusted, credible, and actionable information and assessments that guide decisions.

What is Natural Capital:

The stock of renewable and nonrenewable natural resources (e.g., plants, animals, air, water, soils, minerals) that combine to yield a flow of benefits to people.

These flows can be:

- » *Ecosystem services: benefits to people from ecosystems, which are commonly classified in four major categories – provisioning, regulating, supporting and cultural. The quality and quantity of ecosystem services are influenced by the underlying diversity of genes, species and ecosystems, otherwise known as biodiversity.*
- » *Abiotic services: benefits that do not depend on ecological processes but instead rely on even more fundamental geological processes, such as the supply of minerals, metals, oil and gas, geothermal heat, wind, tides and the annual seasons.*

Natural Capital assessment:

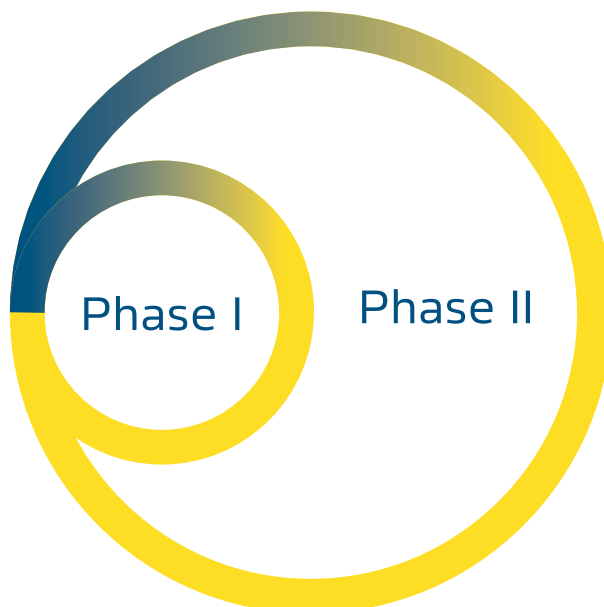
The process of measuring and valuing relevant ("material") Natural Capital impacts and/or dependencies, using appropriate methods. (Natural Capital Protocol)



The pilot project

TCCC has used its broad range of water replenishment projects to pilot the evaluation methodology outlined in the NC Protocol and to provide recommendations on how to maximize ecosystem benefits from water-related interventions. The objective is to better understand the wider ecosystem benefits of replenishment projects by evaluating eight selected European projects affecting numerous ecosystem types in five different countries. The work employed the methodology set out in the NC Protocol, including collection of feedback from relevant stakeholders. A related objective of the pilot project was to provide feedback on the draft NC Protocol.

The first phase of the project involved creating a practical valuation tool based on established valuation methodologies and applying the tool to three wetland restoration projects in Europe. The second phase consisted of evaluating additional projects, covering a wider array of geographic regions, and types of ecosystem and intervention, using the tool created in phase I. Consequently, the tool was upgraded and phase I projects were then re-evaluated.



Methodological approach

The **pilot project** applied scientific methodologies under development to a real-world example of corporate decision-making. We went through the following major steps:

Phase I: Developing an ecosystem services valuation (ESV) tool

1. Reviewing scientific literature
2. Selecting ten main global ecosystem types and 22 ecosystem services that have been evaluated
3. Selecting values for benefit transfer: single study values as well as global minimum, maximum, mean and median from a database of 1,350 valuation factors¹
4. Establishing five pre-defined categories for the level of ecosystem service provision, enabling an assessment of their state
5. Establishing three key project performance indicators

Phase II: Integrating project-specific data and assessing project performance

6. Obtaining specific replenishment-project information: area, affected ecosystems, replenishment volumes, other activities and impacts, timeframe, project costs, inflation, and discount rate
7. Converting project-specific data if the per hectare values were not available (e.g. cubic meters of replenished water into per hectare values)
8. Establishing baseline and post-intervention state based on available data and expert assessment
9. Calculating the key project performance indicators:
 - » Total ecosystem change (TEC)
 - » Net present value (NPV)
 - » Total investment multiplier (TIM)
10. Validating results by means of a site visit to one of the projects
11. Interpreting and analyzing results
12. Engaging with key stakeholders and incorporating feedback

Benefit transfer:

A technique that takes a value determined in one context and applies it to another context. Benefit transfer can be used with all valuation approaches and is most commonly used for estimating non-market and non-use values, which have been elsewhere valued with cost- and time-intensive stated preference techniques. (Natural Capital Protocol)

Total ecosystem change: one value to show how the entire ecosystem has improved due to our replenishment intervention (between 0% and 100%)

Net present value: Profit and loss account for the project, i.e. showing the ecosystem profits generated due to our replenishment intervention in monetary terms (\$)

Total Investment Multiplier: shows "how well the money was spent" – NPV generated per dollar of investment (number)

¹ 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: <http://www.sciencedirect.com/science/article/pii/S2212041612000101>



In summary, each project was assessed in two basic steps in line with the requirements of the NC Protocol:

- » **Measure** the change in the state of ecosystem services (before and after); and
- » **Evaluate** the net gain in ecosystem services in monetary terms.

The methodology relies on several critical assumptions:

- » Valuation factors are best and most conservatively represented by median values; under certain conditions, mean values might be applicable.
- » Each project is analyzed over a similar timeframe: start year (2013 to 2015) to 2020.
- » Project costs can be allocated during the first three years of the project; if further costs are available, they are also allocated in the first three years.
- » The quality of ecosystem services is determined on the basis of five separate categories (0%, 25%, 50%, 75%, and 100%) to evaluate the baseline state and the post-intervention state of a particular service.
- » Each project may have an impact on up to three different biomes or ecosystems, which are ultimately summed up using a single output value for NPV and TIM.
- » In the absence of aerial information, water depth is used to approximate the equivalent aerial footprint.
- » The discount rate is 5% for all projects and the inflation rate is 1.5%.

ESV tool users can manually change most of the assumptions described above.

Results and conclusions

The application of the ESV tool to a single project produces the results presented below. The final outcome of the pilot project is presented on a graph showing the results (TEC and TIM) of all eight replenishment projects. Clearly, projects 1 and 3 are outstanding, as both TEC and TIM are high. Most projects lead to high ecosystem change but generate a lower return on investment for the environment (lower right quadrant).

An attractive project (higher TEC, TIM or NPV) typically has the following features:

- » Larger aerial footprint
- » Larger water replenishment volume
- » Occurs in a site with high conservation value (e.g. national park or World Heritage Site)
- » Involves large-scale wetlands (not grasslands, woodlands or rivers)
- » Leads to a significant positive impact on the state of ecosystem services (improvement of at least two categories)
- » Occurs in lower-income countries or incurs lower overall costs

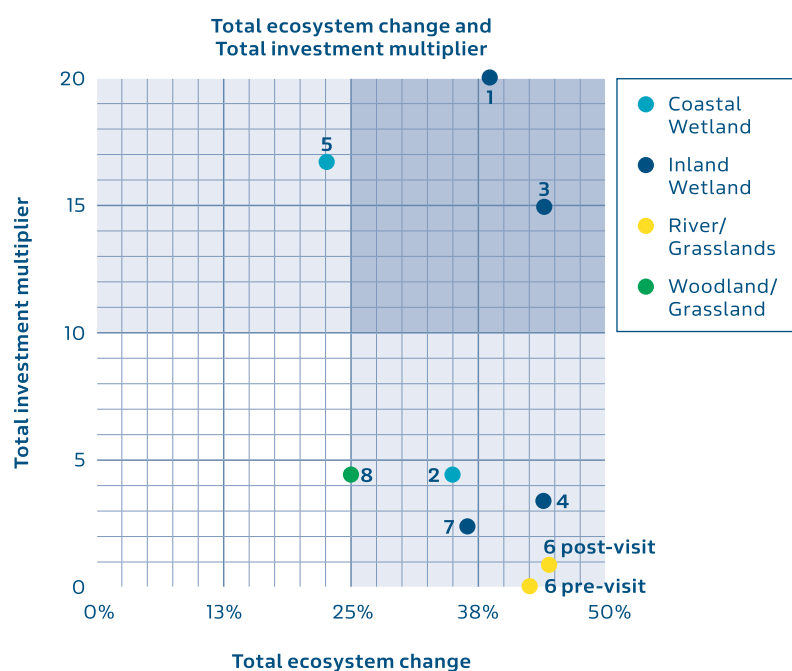
Benchmarking indicators

Project level indicators

Total ecosystem change	23 %
Project NPV	3,328,372
Total investment multiplier	16.71

Ecosystem services category indicators

Provisioning services multiplier	1.87
Regulating services multiplier	15.52
Supporting services multiplier	0.00
Cultural services multiplier	4.40



We observe a relatively weak correlation between replenishment volumes and the TEC, TIM or NPV of projects (except in large-scale wetland restoration). This is to be expected, as water quantity is not the only contributor to ecosystem health, and many projects include conservation measures (meandering, decrease in siltation, revegetation, rewilding, etc.) that are not reflected by water volumes, but have significant positive impacts on the environment. This means that NC accounting actually builds on the current metrics used in the TCCC water replenishment program and reveals additional benefits.

Stakeholder engagement (not part of the evaluation) must be part of the bigger picture, as certain projects (with lower NPV/TIM) may be extremely valuable for stakeholders and ultimately generate added value for TCCC. Such projects may be undervalued by the ESV tool.

Additionally, the TCCC pilot project provided feedback to the NC Coalition on the draft Protocol:

- » The Protocol assumes that business has a predominantly negative environmental impact and its approach is better suited to assessing negative impacts. Our projects provide benefits.
- » The Protocol assumes that impacts or projects occur along a company's main value chain. Although some are related, most of our projects lie outside the TCCC value chain.
- » The Protocol is rather long for a standard. We suggested splitting it into a (short) standard and a guidance manual.

Methodological limitations

The methodology for the pilot project has certain limitations:

- » Use of secondary data only
- » Dependence on the availability of benefit transfer factors
- » Insufficient project data, as implementation partners were not required to monitor changes in ecosystem services but concentrated instead on water replenishment volumes
- » Time-bound, discrete logic which does not calculate ecosystem service quality in a continuous manner
- » Possibility for expert assessment to significantly influence project impact categorization
- » Assessment of total ecosystem change made by experts on a qualitative basis
- » Very limited availability of valuation factors for ecosystem services of rivers, woodlands and grasslands – many more factors are available for coastal and inland wetlands, leading to much higher NPV and TIM results for projects affecting the latter
- » Use of minimum, median, mean and maximum values is based on expert opinion
- » The importance to stakeholders or the company (supply chain) is not considered

The ESV tool will always deliver higher NPV for wetland projects because the value of wetland ecosystem services tends to be much higher than services of other ecosystems, as illustrated by the empirical valuation factors.

It is essential to note that the ESV tool does not produce a stand-alone NC valuation for a specific site or project. It serves as an easy-to-apply instrument for comparison of projects in terms of their impact on Natural Capital and return on investment. For stand-alone project assessments, valuation factors based on primary data and more local data are necessary.

Future Actions:

TCCC is committed to continuing its work on Natural Capital accounting for water replenishment projects by means of some of the following next steps:

- » *Obtaining feedback from project partners and external stakeholders on the methodology and approach developed*
- » *Drafting guidance on design and implementation of water replenishment projects so that ecosystem service benefits can be planned, measured and valued*
- » *Implementing a deep dive project at one project site, aimed at identifying factors based on primary data and leading to more accurate estimates of monetary value*
- » *Applying the ESV tool to additional water replenishment projects, with a view to producing a global impact report*

It should be noted that ESV results will not be the only factor used in overall project assessment and decision-making, as water risks, scalability of projects as well as stakeholder opinions will also be taken into account.



Contact denkstatt:

Willibald Kaltenbrunner
Managing Partner

denkstatt GmbH
willibald.kaltenbrunner@denkstatt.at
+43 (0)1 786 89 00

Contact TCCC:

Ulrike Sapiro
Director Sustainability

The Coca-Cola Company, WE-BU
usapiro@coca-cola.com
+32 (0)2 559 20 86