# Cargill's Context-Based Water Target Setting Methodology

Cargill's approach to setting context-based water targets follows the latest guidance from the World Resources Institute (WRI), WWF, The Nature Conservancy, Pacific Institute, CDP, and CEO Water Mandate.[i,ii] This jointly developed guidance by leading NGOs calls for effective water targets to:

- prioritize action where it's needed most, based on the specific water challenges faced by the local community and watershed;
- reflect the severity of the water challenges faced by that community and watershed, and Cargill's contribution to those challenges;
- reflect the best available science, policy objectives, leading practice.

Grounded in this guidance and in partnership with WRI, Cargill followed these 3 steps to set global, company-wide context-based water targets.

## 1. Scoping: Prioritize sections of the value chain and shared water challenges

In the analysis of the value chain Cargill looked at sourcing, processing, product application and end-customer use. Cargill decided to focus on the agricultural supply chain and its operations based on where Cargill has the largest footprint and the greatest ability to drive change. Globally, agriculture accounts for approximately 70% of total water use, according to widely-cited studies, including FAO[iii] and OECD[iv]. Operations are included to materialize the opportunity associated with sustainable water management, mitigate water-related risk and align actions with Cargill's values.

Shared water challenges are water-related issues or threats shared by a site and other stakeholders within the same watershed. They represent a company's risks, dependencies, and impacts. Cargill identified its priority shared water challenges to be:

- Water availability: scarcity and depletion, inadequate infrastructure and competition for water
- Water quality: excess nutrients from agricultural run-off and pollutants from industrial discharge
- Water access: access to safe drinking water and sanitation

Cargill chose these challenges because they are essential for people and agriculture. Cargill partnered with WRI to identify global data sets for each of the above challenges.

## 2. Prioritization: Identify priority watersheds and their water challenges

The holistic approach, which is data driven and science based, allows Cargill to prioritize action where it's needed most, based on the specific water challenges faced by the local community and watershed. The following steps were taken to identify the priority watersheds and their challenges:

1. Collect data to determine geospatial contribution and global (associated) footprint

    a. *Collect data on sourcing locations and volumes of crops (supply chain)*.

    Cargill provided data on sourcing locations for the most material crops in its global value chain, and volumes of crop sourced by location. Sub-country data was included when available to increase granularity.

    b. *Collect data from facilities to determine water usage and impacts (operations).*

    Cargill implemented a global reporting system that calculates the water balance for each facility and the constituent discharge loads to a natural water body after final treatment. The water balance allows Cargill to determine both the total withdrawal from different water sources and the consumptive water use.

2. *Identify best available datasets to determine severity of the challenge and set priority thresholds*. To ensure targets were set for the right locations, Cargill relied on the best available science to identify watersheds with the most severe shared water challenges and appropriate thresholds for classifying the watershed as a priority. Cargill and WRI identified the following datasets and thresholds for each shared water challenge:

    a. *Availability (supply chain):* Water depletion[v] dataset with a 25% threshold, meaning watersheds in which total annual consumption represents 25% or more of renewable supply are deemed a priority due to severity of the water challenge.

    b. *Quality (supply chain):* Total nutrient loadings[vi,vii] to surface waters dataset with a threshold of the 75$^{th}$ percentile, meaning watersheds whose total nutrient loadings are greater than at least 75% of all watersheds are deemed a priority due to severity of the water challenge.

    c. *Access to safe drinking water (supply chain):* Unimproved/no drinking water with a threshold of 5%, meaning at least 5% of the population in any given watershed is collecting drinking water from unprotected sources.

    d. *Availability (operations):* Water stress[viii] dataset with a 40% threshold, meaning watersheds in which total annual withdrawals represent 40% or more of renewable supply are deemed a priority due to severity of the water challenge.

3. *Calculate Cargill's contribution to the water challenges, by priority watershed:* To determine Cargill's opportunity to drive change towards the desired condition, Cargill's footprint was quantified in each priority watershed. The following datasets and methods were used for each water challenge for which a quantitative target was set:

a. *Availability (supply chain)*: consumptive water use of irrigated crops[ix] (blue water footprint)

b. *Quality (supply chain)*: Using data from step 2 on nutrient loadings, a global geospatial data layer on crop production and area[x], and Cargill's souring information, Cargill's proportional share of nutrient loading in each priority watershed was calculated.

c. *Availability (operations)*: consumptive water use, any water not returned to the source it was withdrawn from, in accordance with CDP definition

d. *Quality (operations)*: Load after final treatment (including both internal and external treatment). Nitrogen load is used, unless another key substance of concern was identified, based on the watershed conditions and Cargill operations

4. *Determine thresholds for business materiality:* Building off the prioritization due to the severity of the challenge, the next step determined the size of Cargill's footprint in these watersheds. Cargill set materiality thresholds for each shared water challenge to ensure they can effectively drive change in the right places. Setting materiality thresholds allows Cargill to focus on more than 80% of the footprint associated with water challenges, while concentrating the number of regions to focus on.

5. *Identify priority watersheds:* A geospatial analysis for each shared water challenge was conducted to identify priority watersheds which reflect both the severity of challenge and Cargill's footprint. Results were internally validated.

## 3. Target setting: Context-Based Targets

1. *Determine type of target*. Context-based water targets may be quantitative, specifying the change required to meaningfully respond to the water challenge, or process-oriented, driving process changes in company performance and activities. Cargill set quantitative targets for water availability and quality across its supply chains and process-oriented targets for operations' direct water use and for access to safe drinking water across its supply chain.

2. *Identify the desired conditions to address shared water challenges in each priority watershed.* The desired conditions – reflecting the goal of eliminating or reducing the water challenge – were determined using the same datasets and thresholds as were used to determine the priority watersheds.

3. *Calculate the desired change based on current state and desired condition:*

   The desired change is calculated as follows:

$$\%\ desired\ change = \frac{current\ state - desired\ state}{current\ state}$$

   The current state is determined as part of the prioritization and reflects the severity of the water challenge of each watershed.

4. *Calculate quantitative targets for each shared water challenge in each watershed.*

   watershed target = % desired change * associated footprint.

5. *Calculate quantitative company-wide targets for enterprise:* The sum of the watershed targets for each shared water challenge equals the target for Cargill.

The three-step process has led to the following context-based targets that support our global ambition to achieve sustainable water management in our operations and all priority watersheds by 2030.

By 2030, Cargill will:

6. Restore 600 billion liters of water in priority watersheds
7. Reduce 5 million kg of water pollutants in priority watersheds
8. Implement our Water Stewardship program at all 81 priority facilities
9. Improve access to safe drinking water in 25 priority watersheds

The priority facilities and priority watersheds will be re-assessed on a regular basis to reflect best available science and shifts in operations and supply chains. They may change over time due to acquisitions, divestitures or significant changes to our operations.

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[i] UN Global Compact CEO Water Mandate, Pacific Institute, CDP, The Nature Conservancy, World Resources Institute, WWF, UNEPDHI Partnership Centre for Water and Environment. 2019. Setting Site Water Targets Informed by Catchment Context: A Guide for Companies. www.ceowatermandate.org/site-water-targets.

[ii] UN Global Compact CEO Water Mandate, Pacific Institute, CDP, The Nature Conservancy, World Resources Institute, and WWF. *Forthcoming.* Setting Enterprise Water Targets Informed by Catchment Context: A Guide for Companies.

[iii] Food and Agriculture Organization of the United Nations (2017), Water for Sustainable Food and Agriculture, Rome, http://www.fao.org/3/a-i7959e.pdf

[iv] OECD (2017), Water Risk Hotspots for Agriculture, OECD Studies on Water, OECD Publishing, Paris, https://doi.org/10.1787/9789264279551-en.

[v] Ibid

[vi] Beusen, A.H.W., Van Beek, L.P.H., Bouwman, A.F., Mogollón, J.M., Middelburg, J.J., 2015. Coupling global models for hydrology and nutrient loading to simulate nitrogen and phosphorus retention in surface water. Description of IMAGE-GNM and analysis of performance. Geoscientific Model Development 8, 4045–4067, doi:4010.5194/gmd-4048-4045-2015

[vii] White, Michael, Daren Harmel, Haw Yen, Jeff Arnold, Marilyn Gambone, and Richard Haney, 2015. Development of Sediment and Nutrient Export Coefficients for U.S. Ecoregions. Journal of the American Water Resources Association (JAWRA) 51(3): 758-775. DOI: 10.1111/jawr.12270

[viii] Hofste, R., S. Kuzma, S. Walker, E.H. Sutanudjaja, et. al. 2019. "Aqueduct 3.0: Updated Decision-Relevant Global Water Risk Indicators." Technical Note. Washington, DC: World Resources Institute. Available online at: https://www.wri.org/publication/aqueduct-30.

[ix] Mekonnen, M.M. & Hoekstra, A.Y. (2011) The green, blue and grey water footprint of crops and derived crop products, *Hydrology and Earth System Sciences*, *15*(5): 1577-1600.

[x] International Food Policy Research Institute, 2019, "Global Spatially-Disaggregated Crop Production Statistics Data for 2010 Version 1.1", https://doi.org/10.7910/DVN/PRFF8V, Harvard Dataverse, V3