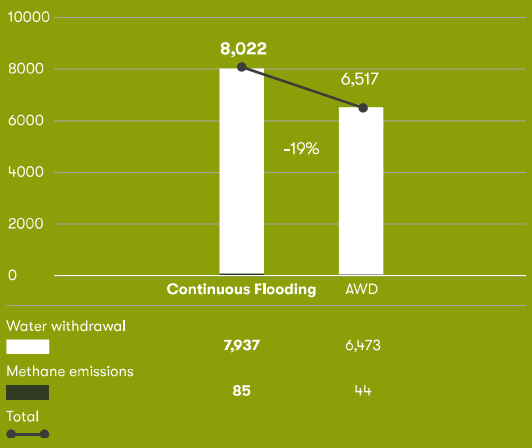
Case study: NC impact valuation of reduced methane emissions and water withdrawal using Alternate Wetting and Drying (AWD), in Haryana, India

Estimated annual NC impact of methane emissions and water use per tonne of rice (US$/tonne)



Olam is committed to mitigating the impacts of rice farming on climate change and ecosystems by training rice farmers on the sustainable rice farming technique of AWD[A] as part of the Sustainable Rice Platform (SRP)-registered training programme.

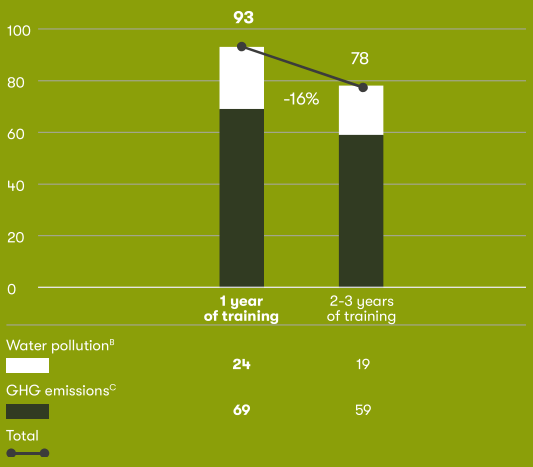
In 2020, Olam piloted the AWD training programme with 300 rice farmers in Haryana, India. We have compared the estimated NC value of methane emissions[D] and water withdrawal[E] between rice farms that implemented AWD and those that use the traditional rice farming method of continuous flooding based on internal data.

The annual value of NC impacts associated with methane emissions and water withdrawal were estimated to be reduced by 48%[F] and 18% per tonne of rice respectively. In total, the farms implementing AWD are estimated to have decreased their NC impacts by 335 tCO_2e of methane emissions and approximately 300,000 m^3 of water with an estimated social value of approximately US$800,000.

Olam plans to scale up the AWD training programme to 1,000 farmers by 2023.

Case study: NC impact valuation of reduced water pollution and GHG emissions following fertiliser training in Ubon, Thailand

Estimated annual NC impact of fertiliser leakage and GHG emissions associated with fertiliser use per tonne of rice (US$/tonne)



Recognising the potential impacts of fertiliser use on GHG emissions and freshwater pollution as a result of potential eutrophication. Olam provides training to farmers with the objective of changing behaviour to reduce synthetic fertiliser use on-farm and to encourage an optimal balance of fertiliser use as part of the SRP-registered training programme.

Olam has estimated the NC impact of changes in fertiliser use by comparing fertiliser use for 2,400 farmers that have received 2-3 years of training to those that have received 1 year of training as at 2020.

Per tonne of rice, the annual societal costs of water pollution and GHG emissions[D] were estimated to be reduced by 14% and 21% respectively. In the 2,400 farms, additional fertiliser training is estimated to have decreased fertiliser leakage into water by approximately 8,700 kg and associated GHG emissions by 270 tCO_2e. This is estimated as a decrease in NC impact of approximately US$75,000 in 2020.

Olam plans to scale up the fertiliser training programme in Thailand to 18,000 farmers by 2022.

Natural Capital valuation assumptions and notes

Carbon emissions: We have applied a Social Cost of Carbon (SCC)[G] of US$90/$tCO_2e$ to value the costs to society of climate change impacts due to GHG emissions, measured by a global GDP reduction.

Water use: The shadow price of water[H], which accounts for the value of 'services' provided by water to human health, ecosystems, agriculture and domestic supply, is calculated to be US$2.52/$m^3$ for Haryana. The valuation excludes rainwater as the rainwater anomaly[I] was above the normal range in India in 2020. Olam will continue to update its water use methodology as more appropriate data become available.

Water pollution: Olam has applied the environmental prices[J] of nitrogen (N) and phosphorus (P) emissions to water from fertiliser use. There is a limitation on the use of European values in the context of Thailand as damage costs of environmental pollution can vary widely according to local circumstances. Olam will continue to update its water pollution methodology as more appropriate valuation data become available. The leakage rates (leaching and runoff) of N and P from fertilisers are assumed to be 24%[D] and 40%[K] respectively.

+ For details about IIS and NC P&L and NCBS valuation methodologies, visit olamgroup.com/sustainability/innovation-technology/finance-for-sustainability

Disclaimer

Olam's Natural Capital accounting analyses are not related to financial results or financial reporting. The analyses and insights are specific to the selected operations and are based on the use of environmental economic estimates of non-monetary ecosystems, goods and services; they should not be used outside the context of our analyses. All underlying methodologies are based on well-established databases and frameworks. However, as they depend on third-party expert studies, all values are indicative estimations and are provided as ballpark estimates to inform debate in relation to the management and mitigation of natural capital impacts. There are limitations with respect to some of the methods used to show values in the NCIS and NCBS. Results from the NC valuation analyses may be readjusted according to further methodological refinements.

Supporting notes for rice case studies on page 115, and above assumptions and notes.

A. AWD is a water management practice where irrigation is applied at intermittent intervals resulting in alternating wet and dry soil conditions, according to the SRP Standard for Sustainable Rice Cultivation (Version 2.1), Sustainable Rice Platform, Bangkok, 2020. AWD is also featured in AMS-III.AU. Small-scale Methodology: Methane emission reduction by adjusted water management practice in rice cultivation, Clean Development Mechanism, United Nations Framework Convention on Climate Change.
B. Fertiliser leaked to water.
C. GHG emissions associated with fertliser use.
D. In accordance with the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Calvo Buendia, E., Tanabe, K., Kranjc, A., Baasansuren, J., Fukuda, M., Ngarize, S., Osako, A., Pyrozhenko, Y., Shermanau, P., and Federici, S. (eds). Published: IPCC, Switzerland.
E. Water withdrawal is used as a proxy for water consumption due to lack of precise water discharge data. Note for informational purposes only: water consumption is about 80% of water withdrawn in Indian farms, according to Effective rainfall in irrigated agriculture, FAO Irrigation and Drainage Paper, Dastane, N.G., Food and Agriculture Organization, United Nations, 1978.
F. The value of NC impacts associated with methane emissions represents ≤1% of the total NC impacts measured.
G. Mid-point of SCC recommended by Massachusetts Institute of Technology (Pindyck, R S. 2019, The social cost of carbon revisited).
H. We have used the shadow water pricing methodology from the Corporate Bonds Water Credit Risk Tool developed by GIZ/NCD/VfU (2015).
I. Rainfall anomaly is the ratio between rainfall for the current year and the long-term average rainfall in the region, expressed in percentage terms. Values between 90% and 110% are considered as being within the range of normal variability, according to World Food Programme's Vulnerability Analysis and Mapping (VAM). In India, the rainfall anomaly was above 110% in 2020.
J. Environmental prices from CE Delft Environmental Prices Handbook EU28 Version (2015), corrected for inflation and purchase power parity.
K. Johnston, A.E. and Roberts, T.L. (2015), "Phosphorus Use Efficiency and Management in Agriculture", Resources, Conservation and Recycling, Volume 105, Part B, December 2015, Pages 275-281.