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Supporting information for: "The value of water in agriculture in a global high-resolution analysis"

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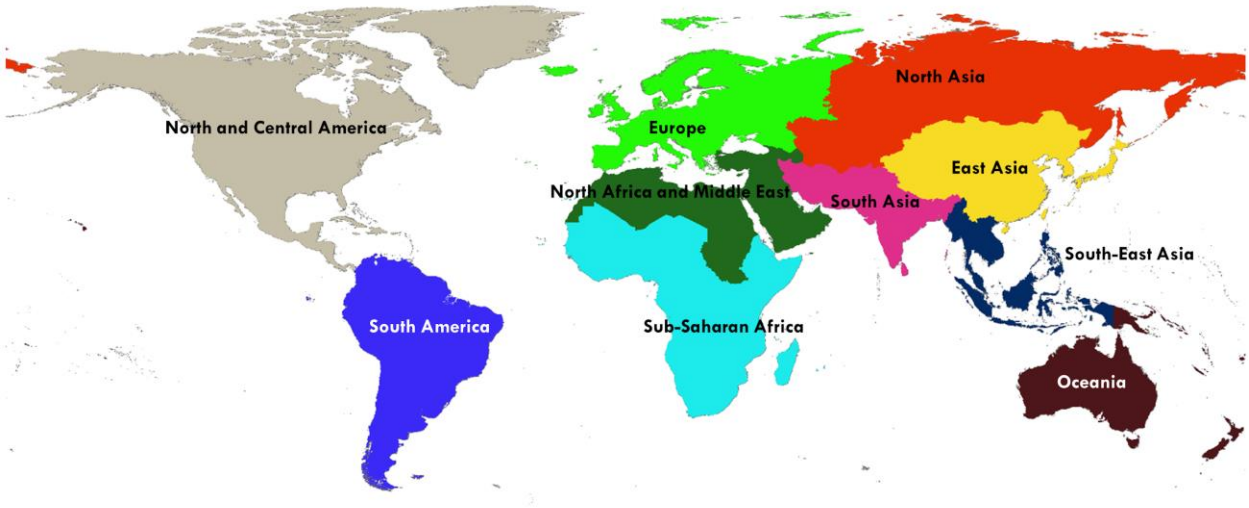

Figure S1. Regions considered in this study.

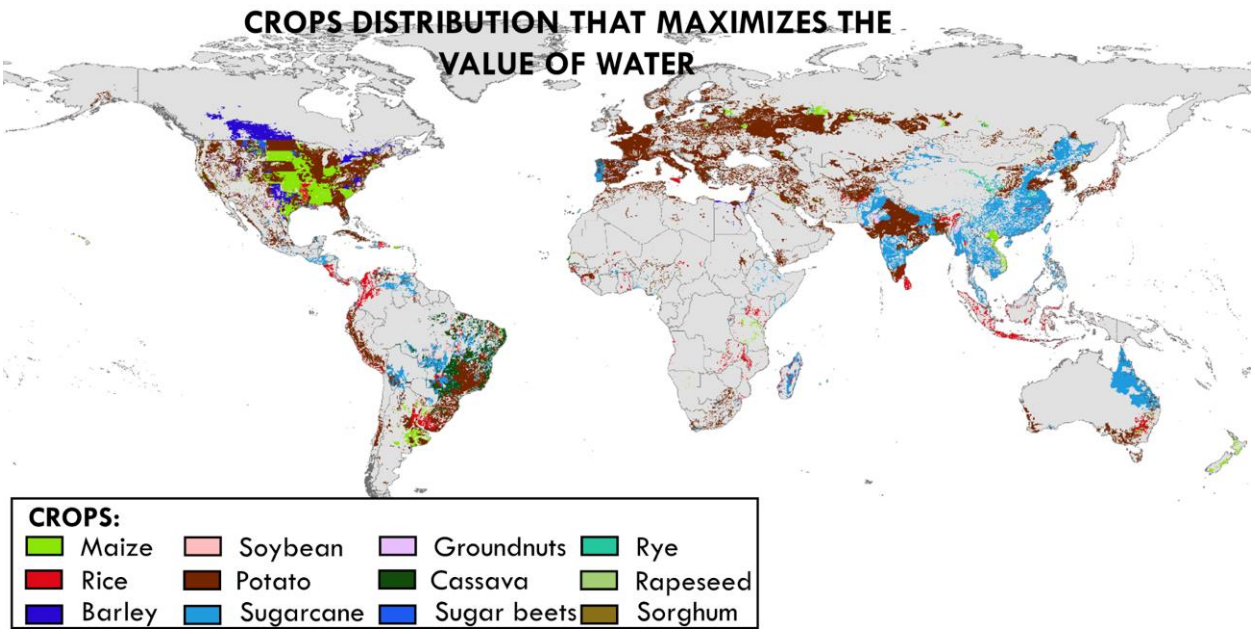

Figure S2. Distribution of crops associated with maximum values of irrigation water.

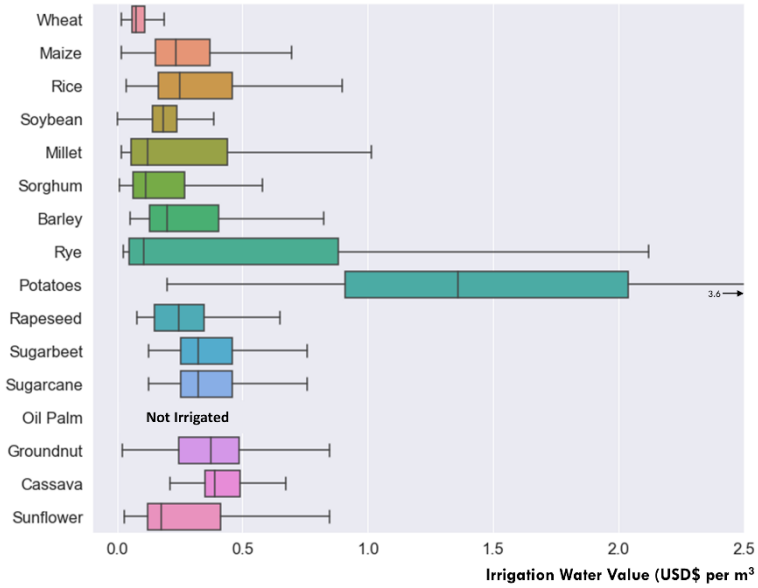

Figure S3. Crop-specific irrigation water values estimated based on irrigation water *consumption*. The boxplots represent median, 25th and 75th percentile, and maximum and minimum values, outliers are not shown in the figure. Water values estimated with reference to *water withdrawals* are shown in Figure 3.

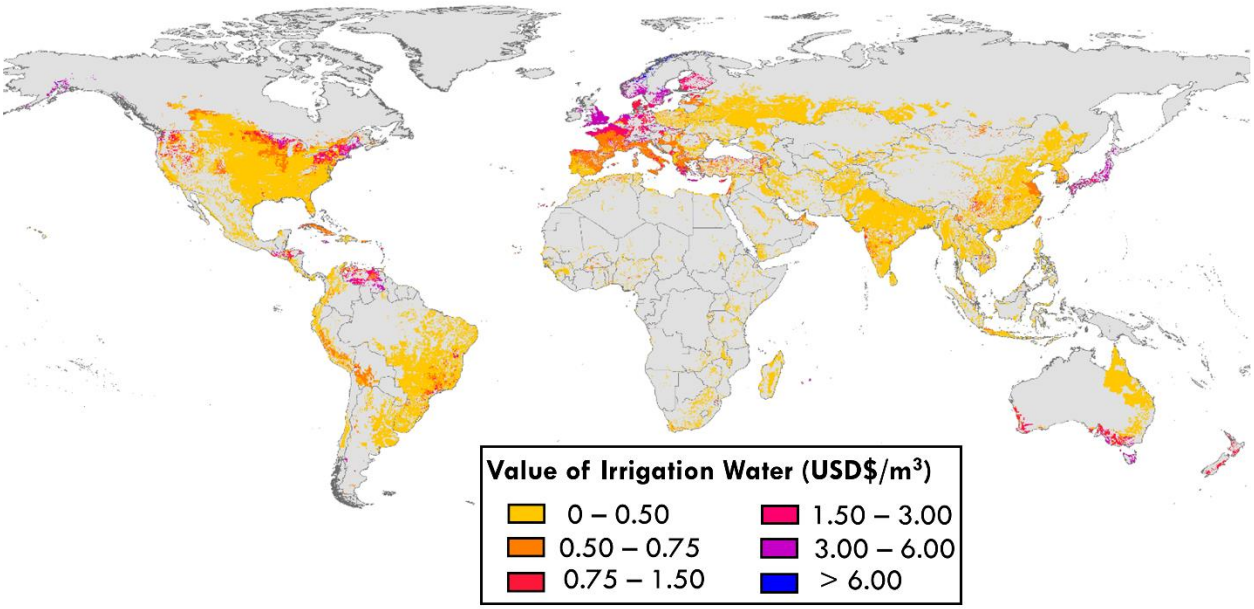

Figure S4. Global map of irrigation water values, based on the existing crop distribution and accounting only for *water consumption volumes*.

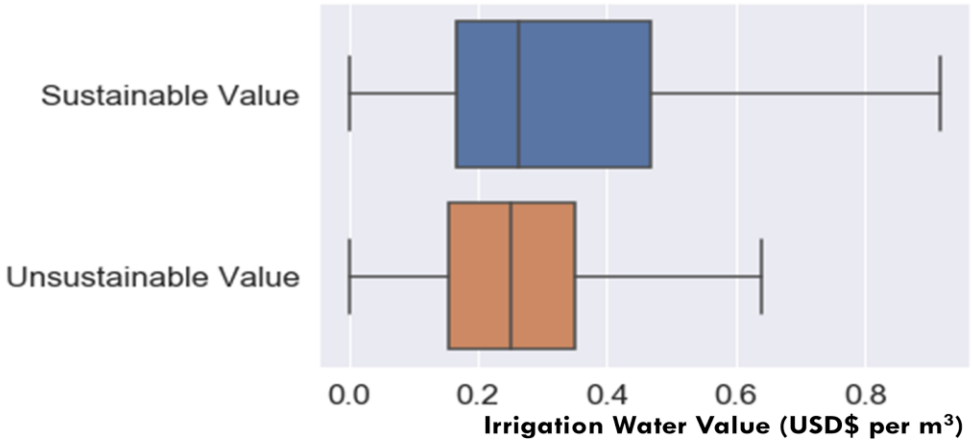

Figure S5. Value of irrigation water in areas suitable for sustainable and unsustainable irrigation. Based on water *consumption* with the existing crop distribution and irrigated areas. Sustainable and unsustainable irrigation areas were taken from Rosa et al. (2018) (ref. 2).

Table S1. Global crop-specific irrigation water values in USD$/m^3. The table shows mean, median, 25% percentile, and 75% percentile using current (circa year 2000) crop distribution. 'Average current value' is calculated as a global average in Figure 4a. 'Average maximized value' is given by the distribution of crops that maximize the economic productivity of irrigation water (Figure 4b).

	Mean	25% Percentile	Median	75% Percentile
Wheat	0.05	0.03	0.05	0.06
Maize	0.16	0.08	0.13	0.21
Rice	0.16	0.07	0.12	0.21
Soybean	0.10	0.06	0.09	0.13
Millet	0.13	0.03	0.04	0.19
Sorghum	0.09	0.04	0.07	0.12
Barley	0.16	0.07	0.12	0.22
Rye	0.22	0.03	0.07	0.39
Potatoes	0.90	0.49	0.67	1.02
Rapeseed	0.16	0.05	0.11	0.26
Sugarbeet	0.26	0.16	0.23	0.33
Sugarcane	0.51	0.11	0.25	0.91
Oil Palm	Not Irrigated			
Groundnut	0.17	0.11	0.15	0.20
Cassava	0.18	0.15	0.17	0.21
Sunflower	0.16	0.07	0.12	0.25
Average Maximized Value	0.71	0.21	0.54	0.96
Average Current Value	0.23	0.08	0.13	0.23

Table S2. Annualized cost of irrigation water provision in Australia, calculated using 2002-2017 data on the cost of investments in infrastructure and equipment (ABS, 2018), amortized on a 50 year and 20 year timeframe, respectively, plus the annual operation cost[1]. Per unit volume values (column 8) were obtained from column 6/column 3/column 2, with AUD/USD=0.83, corresponding to the average conversion factor for 2002-2017.

Region	Avg. watered Area	Irrigation water withdrawals	Annualized Cost of equipment & infrastructure	Annual Cost of operation	Annual Cost of Irrigation	Annual Cost of Irrigation Water Provision	
	10^3 ha	Km^3	AUD ha^{-1}	AUD ha^{-1}	AUD ha^{-1}	AUD m^{-3}	USD m^{-3}
New S. Wales	752	3.557	14	76	90	0.019	0.016
Victoria	549	2.124	10	58	68	0.018	0.015
Queensland	523	2.429	15	34	49	0.011	0.009
S. Australia	186	0.865	24	96	120	0.026	0.021
W. Australia	62	0.361	21	55	76	0.013	0.011
Tasmania	90	0.26	15	71	86	0.030	0.025
N. Territory	5	0.045	21	97	118	0.013	0.011

Table S3. Estimate of the agricultural revenues generated by irrigation, based on analyses by *Borsato et al.,* (2020) (ref. 1).

Year	Area Watered	Total Irrigation water applied	Irrigation revenue	Value of Irrigation Water	
	10^3 ha	Km^3	AUD/ha	AUD m^{-3}	USD m^{-3}
2016-17	2,245	9.104	1,901	0.47	0.35
2015-16	2,148	8.381	1,868	0.48	0.35
2014-15	2,149	8.950	1,933	0.46	0.39
2013-14	2,361	10.731	1,906	0.42	0.39
2012-13	2,377	11.060	1,697	0.36	0.37
2011-12	2,141	8.174	1,318	0.35	0.36
2010-11	1,963	6.645	1,107	0.33	0.32
2009-10	1,840	6.596	1,484	0.41	0.37
2008-09	1,761	6.501	1,712	0.46	0.35
2007-08	1,851	6.285	1,503	0.44	0.40
2006-07	1,923	7.636	1,998	0.50	0.40
2005-06	2,546	10.737	1,214	0.29	0.22
2004-05	2,405	10.085	1,090	0.26	0.20
2003-04	2,402	10.442	1,156	0.27	0.19
2002-03	2,378	10.402	1,262	0.29	0.17

References

1. Borsato, E., Rosa, L., Marinello, F., Tarolli, P. and D'Odorico, P., 2020. Weak and Strong Sustainability of Irrigation: A framework for irrigation practices under limited water availability. *Front. Sustain. Food Syst. 4: 17. doi: 10.3389/fsufs*.
2. Rosa., L., M.C. Rulli, K.F. Davis, D. Chiarelli, C. Passera, P. D'Odorico (2018). Closing the yield gap while ensuring water sustainability, Environm. Res. Lett., 13 104002.