

## Supplement

**Table S1.** Countries in the GTAP trade database.

Number	Country Name	Number	Country Name
1	Australia	47	Ireland
2	New Zealand	48	Italy
3	Rest of Oceania	49	Luxembourg
4	China	50	Netherlands
5	Hong Kong	51	Portugal
6	Japan	52	Spain
7	Republic of Korea	53	Sweden
8	Taiwan	54	Switzerland
9	Rest of East Asia	55	Rest of EFTA
10	Indonesia	56	Rest of Europe
11	Malaysia	57	Albania
12	Philippines	58	Bulgaria
13	Singapore	59	Croatia
14	Thailand	60	Cyprus
15	Vietnam	61	Czech Republic
16	Rest of Southeast Asia	62	Hungary
17	Bangladesh	63	Malta
18	India	64	Poland
19	Pakistan	65	Romania
20	Sri Lanka	66	Slovakia
21	Rest of South Asia	67	Slovenia
22	Canada	68	Estonia
23	United States of America	69	Latvia
24	Mexico	70	Lithuania
25	Rest of North America	71	Russian Federation
26	Bolivia	72	Rest of Former Soviet Union
27	Colombia	73	Turkey
28	Ecuador	74	Iran, Islamic Republic of
29	Peru	75	Rest of Middle East
30	Venezuela	76	Morocco
31	Argentina	77	Tunisia
32	Brazil	78	Rest of North Africa
33	Chile	79	Botswana
34	Uruguay	80	South Africa
35	Rest of South America	81	Rest of South African Customs Union
36	Central America	82	Malawi
37	Rest of Free Trade Area of the Americas	83	Mauritius
38	Rest of the Caribbean	84	Mozambique
39	Austria	85	Tanzania
40	Belgium	86	Zambia
41	Denmark	87	Zimbabwe
42	Finland	88	Rest of Southern African Development Community
43	France	89	Madagascar
44	Germany	90	Nigeria
45	United Kingdom	91	Uganda
46	Greece	92	Rest of sub-Saharan Africa

**Table S2.** Definition of regions in the GTAP trade database.

Region Name	Country List
Rest of Oceania	American Samoa, Cook Islands, Fiji, French Polynesia, Guam Kiribati, Marshall Islands, Federated States of Micronesia, Nauru, New Caledonia, Niue, Norfolk Islands, Northern Mariana Islands, Palau, Papua New Guinea, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, Wallis & Futuna
Rest of East Asia	Democratic People's Republic of Korea, Macau, Mongolia
Rest of Southeast Asia	Brunei Darussalam, Cambodia, Lao People's Democratic Republic, Myanmar, Timor-Leste
Rest of South Asia	Afghanistan, Bhutan, Maldives, Nepal
Rest of North America	Bermuda, Greenland, Saint Pierre & Miquelon
Rest of South America	Falkland Islands, French Guiana, Guyana, Paraguay, Suriname
Central America	Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama
Rest of Free Trade Area of the Americas (FTAA)	Antigua & Barbuda, Bahamas, Barbados, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, Puerto Rico, Saint Kitts & Nevis, Saint Lucia, Saint Vincent & the Grenadines, Trinidad & Tobago, US Virgin Islands
Rest of the Caribbean	Anguilla, Aruba, Cayman Islands, Cuba, Guadeloupe, Martinique, Montserrat, Netherlands Antilles, Turks & Caicos, British Virgin Islands
Rest of European Free Trade Area (EFTA)	Iceland, Liechtenstein, Norway
Rest of Europe	Andorra, Bosnia & Herzegovina, Faroe Islands, Gibraltar, Macedonia, Monaco, San Marino, Serbia & Montenegro
Rest of Former Soviet Union	Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Turkmenistan, Ukraine, Uzbekistan
Rest of Middle East	Bahrain, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Palestinian Territory, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates, Yemen
Rest of North Africa	Algeria, Egypt, Libyan Arab Jamahiriya
Rest of South African Customs Union (SACU)	Lesotho, Namibia, Swaziland
Rest of Southern African Development Community (SADC)	Angola, The Democratic Republic of Congo, Mauritius, Seychelles
Rest of sub-Saharan Africa	Benin, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Cote d'Ivoire, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Mali, Mauritania, Mayotte, Niger, Nigeria, Reunion, Rwanda, Saint Helena, Sao Tome & Principe, Senegal, Sierra Leone, Somalia, Sudan, Togo

**Table S3.** Yield shocks by country, crop, and scenario. Each shock represents the projected percentage change [%] from 2001 to 2030. These values follow Hertel et al. (2010).

Country	Rice			Soy			Wheat		
	Low	Med	High	Low	Med	High	Low	Med	High
Australia	-5	7	19	-10	2	14	-5	7	19
New Zealand	-5	7	19	-10	2	14	-5	7	19
Rest of Oceania	-5	7	19	-10	2	14	-5	7	19
China	-12	0	12	-12	0	12	-10	2	14
Hong Kong	-10	-3	4	-10	-3	4	-10	-3	4
Japan	2	9	16	2	9	16	-3	4	11
Republic of Korea	5	12	19	5	12	19	5	12	19
Taiwan	5	12	19	5	12	19	5	12	19
Rest of East Asia	-10	-3	4	-10	-3	4	-10	-3	4
Indonesia	0	7	14	0	7	14	0	7	14
Malaysia	-10	-3	4	-10	-3	4	-10	-3	4
Philippines	-10	-3	4	-10	-3	4	-10	-3	4
Singapore	5	12	19	5	12	19	5	12	19
Thailand	-10	-3	4	-10	-3	4	-10	-3	4
Vietnam	-10	-3	4	-10	-3	4	-10	-3	4
Rest of Southeast Asia	-10	-3	4	-10	-3	4	-10	-3	4
Bangladesh	-10	-3	4	-10	-3	4	-10	-3	4
India	-15	-5	4	-10	-3	4	-10	-3	4
Pakistan	-15	-5	4	-10	-3	4	-10	-3	4
Sri Lanka	-15	-5	4	-10	-3	4	-10	-3	4
Rest of South Asia	-15	-5	4	-10	-3	4	-10	-3	4
Canada	-10	-3	4	0	12	24	-5	7	19
United States of America	-10	-3	4	-10	2	14	-10	2	14
Mexico	-15	-3	9	-15	-3	9	-15	-3	9
Rest of North America	-10	-3	4	0	12	24	-5	7	19
Bolivia	-10	-3	4	-10	-3	4	-10	-3	4
Colombia	0	7	14	0	7	14	0	7	14
Ecuador	-10	-3	4	-10	-3	4	-10	-3	4
Peru	0	7	14	0	7	14	0	7	14
Venezuela	-10	-3	4	-10	-3	4	-10	-3	4
Argentina	-10	-3	4	-10	-3	4	-10	-3	4
Brazil	-10	-3	4	-5	2	9	-10	-3	4
Chile	-10	-3	4	-10	-3	4	-10	-3	4
Uruguay	-10	-3	4	-10	-3	4	-10	-3	4
Rest of South America	-10	-3	4	-10	-3	4	-10	-3	4
Central America	-15	-3	9	-15	-3	9	-15	-3	9
Rest of FTAA	-15	-3	9	-15	-3	9	-15	-3	9
Rest of Caribbean	-15	-3	9	-15	-3	9	-15	-3	9
Austria	-5	7	19	-5	7	19	-5	7	19
Belgium	-5	7	19	-5	7	19	-5	7	19
Denmark	-5	7	19	-5	7	19	-5	7	19
Finland	-5	7	19	-5	7	19	-5	7	19
France	-5	7	19	-5	7	19	-5	7	19
Germany	-5	7	19	-5	7	19	-5	7	19
United Kingdom	-5	7	19	-5	7	19	-5	7	19
Greece	-5	7	19	-5	7	19	-5	7	19
Ireland	-5	7	19	-5	7	19	-5	7	19
Italy	-5	7	19	-5	7	19	-5	7	19
Luxembourg	-5	7	19	-5	7	19	-5	7	19
Netherlands	-5	7	19	-5	7	19	-5	7	19
Portugal	-5	7	19	-5	7	19	-5	7	19
Spain	-5	7	19	-5	7	19	-5	7	19

**Table S3.** Continued.

Country	Rice			Soy			Wheat		
	Low	Med	High	Low	Med	High	Low	Med	High
Sweden	-5	7	19	-5	7	19	-5	7	19
Switzerland	-5	7	19	-5	7	19	-5	7	19
Rest of EFTA	-5	7	19	-5	7	19	-5	7	19
Rest of Europe	-5	7	19	-5	7	19	-5	7	19
Albania	-5	7	19	-5	7	19	-5	7	19
Bulgaria	-5	7	19	-5	7	19	-5	7	19
Croatia	-5	7	19	-5	7	19	-5	7	19
Cyprus	-5	7	19	-5	7	19	-5	7	19
Czech Republic	-5	7	19	-5	7	19	-5	7	19
Hungary	-5	7	19	-5	7	19	-5	7	19
Malta	-5	7	19	-5	7	19	-5	7	19
Poland	-5	7	19	-5	7	19	-5	7	19
Romania	-5	7	19	-5	7	19	-5	7	19
Slovakia	-5	7	19	-5	7	19	-5	7	19
Slovenia	-5	7	19	-5	7	19	-5	7	19
Estonia	-5	7	19	-5	7	19	-5	7	19
Latvia	-5	7	19	-5	7	19	-5	7	19
Lithuania	-5	7	19	-5	7	19	-5	7	19
Russian Federation	-5	7	19	-5	7	19	-5	7	19
Rest of Former Soviet Union	-5	7	19	-5	7	19	-5	7	19
Turkey	-5	2	9	-5	2	9	-5	2	9
Iran, Islamic Republic of	-5	2	9	-5	2	9	-5	2	9
Rest of Middle East	-5	2	9	-5	2	9	-5	2	9
Morocco	-5	2	9	-5	2	9	-5	2	9
Tunisia	-5	2	9	-5	2	9	-5	2	9
Rest of North Africa	-5	2	9	-5	2	9	-5	2	9
Botswana	-15	-3	9	-15	-3	9	-15	-3	9
South Africa	-20	-8	4	-20	-8	4	-20	-8	4
Rest of SACU	-15	-3	9	-15	-3	9	-15	-3	9
Malawi	-15	-3	9	-15	-3	9	-15	-3	9
Mauritius	-15	-3	9	-15	-3	9	-15	-3	9
Mozambique	-15	-3	9	-15	-3	9	-15	-3	9
Tanzania	-15	-3	9	-15	-3	9	-15	-3	9
Zambia	-15	-3	9	-15	-3	9	-15	-3	9
Zimbabwe	-15	-3	9	-15	-3	9	-15	-3	9
Rest of SADC	-15	-3	9	-15	-3	9	-15	-3	9
Madagascar	-15	-3	9	-15	-3	9	-15	-3	9
Nigeria	-15	-3	9	-15	-3	9	-15	-3	9
Uganda	-15	-3	9	-15	-3	9	-15	-3	9
Rest of sub-Saharan Africa	-15	-3	9	-15	-3	9	-15	-3	9

**Table S4.** List of the 14 GCMs that were used to obtain projections of evapotranspiration under climate change in the H08 global hydrology model.

Number	Global Climate Model
1	UKMO-HadGEM1
2	ECHAM5/MPI-OM
3	UKMO-HadCM3
4	GFDL-CM2.1
5	CGCM3.1 (T47)
6	CSIRO Mk3.0
7	CCSM3
8	MIROC3.2 (medres)
9	GFDL-CM2.0
10	MRI-CGCM2.3.2
11	CNRM-CM3
12	INM-CM3.0
13	PCM
14	IPSL-CM4

**Table S5.** Links that save the most water by crop and scenario. All values are in billions of cubic meters. Note that Export refers to the country of export and Import refers to the country of import. Note that RSEA indicates Rest of Southeast Asia.

Rank	Baseline Volume	Export	Import	Low Volume	Export	Import	High Volume	Export	Import
<b>Agg</b>									
1	12.1	Canada	Venezuela	13.8	Canada	Venezuela	15.8	Canada	Venezuela
2	9.26	Arg	Brazil	10.2	Arg	Brazil	12.1	Arg	Brazil
3	8.90	USA	China	4.79	France	RSSA	6.89	USA	Korea
4	6.58	USA	Korea	4.68	Canada	Japan	6.25	USA	RNA
5	5.14	Brazil	China	4.41	Germany	RNA	5.82	USA	Venezuela
6	4.83	USA	Venezuela	4.29	France	RNA	5.74	Canada	Japan
7	4.82	France	Morocco	3.86	USA	Korea	5.49	France	Morocco
8	4.75	Arg	China	3.85	France	Morocco	5.32	Germany	RNA
9	4.12	Canada	Morocco	3.46	USA	Venezuela	5.10	France	RNA
10	3.97	USA	Indonesia	3.22	USA	Indonesia	5.09	USA	Indonesia
<b>Rice</b>									
1	0.32	USA	CA	0.37	USA	CA	0.29	USA	CA
2	0.21	USA	RFTAA	0.21	Uruguay	Brazil	0.21	Russia	RFSU
3	0.17	Russia	RFSU	0.20	RSA	RFTAA	0.18 x	Uruguay	Brazil
4	0.17	Uruguay	Brazil	0.19	USA	Mexico	0.18	USA	RFTAA
5	0.15	RSA	RFTAA	0.17	USA	RFTAA	0.17	Japan	REA
6	0.10	USA	Mexico	0.13	Japan	REA	0.14	RSA	RFTAA
7	0.09	Japan	REA	0.12	Russia	RFSU	0.10	USA	Mexico
8	0.06	Spain	Belgium	0.08	RNA	RSSA	0.08	Arg	Brazil
9	0.04	USA	RSEA	0.07	USA	RSEA	0.07	Spain	Belgium
10	0.04	Australia	Japan	0.06	Spain	Belgium	0.05	Australia	Japan
<b>Soy</b>									
1	9.06	USA	China	4.86	Canada	Japan	5.23	Canada	Japan
2	5.14	Brazil	China	3.20	USA	Mexico	5.06	USA	Mexico
3	4.75	Arg	China	3.12	USA	Indonesia	4.89	USA	China
4	3.94	USA	Korea	2.63	USA	Korea	4.83	USA	Indonesia
5	3.84	USA	Indonesia	2.16	Canada	China	4.70	USA	Korea
6	3.55	Canada	Japan	2.13	Canada	Mexico	4.01	USA	Japan
7	2.95	Canada	China	1.48	Brazil	China	2.71	Canada	China
8	2.88	USA	Mexico	1.41	USA	Japan	1.95	Canada	Mexico
9	2.67	USA	Japan	1.34	USA	China	1.10	USA	Thailand
10	1.23	Canada	Mexico	0.77	Canada	USA	0.86	Brazil	China
<b>Wheat</b>									
1	12.1	Canada	Venezuela	13.7	Canada	Venezuela	16.2	Canada	Venezuela
2	9.23	Arg	Brazil	10.4	Arg	Brazil	12.6	Arg	Brazil
3	4.87	USA	Venezuela	4.58	Germany	RNA	6.05	France	Morocco
4	4.80	France	Morocco	4.44	France	RNA	6.03	USA	RNA
5	4.12	Canada	Morocco	4.41	France	RSSA	5.97	USA	Venezuela
6	3.84	RFSU	RFSU	4.31	France	Morocco	5.61	Canada	Morocco
7	2.85	Germany	Morocco	3.50	USA	Venezuela	5.32	Germany	RNA
8	2.63	USA	Korea	2.73	Canada	Morocco	5.04	France	RNA
9	2.47	Australia	Tanzania	2.64	Australia	Tanzania	4.42	France	RSSA
10	2.23	Germany	RNA	2.61	USA	RNA	3.65	Germany	Morocco

**Table S6.** Links that lose the most water by crop and scenario. All units and definitions follow those in Table S5.

Rank	Baseline Volume	Export	Import	Low Volume	Export	Import	High Volume	Export	Import
Agg									
1	-2.27	Pakistan	RME	-3.01	Brazil	Neth	-2.46	Brazil	Neth
2	-2.24	USA	Spain	-2.57	Brazil	Spain	-2.04	USA	Spain
3	-1.91	Brazil	Spain	-2.29	Pakistan	RME	-1.90	Brazil	Spain
4	-1.69	Brazil	Neth	-1.78	USA	Spain	-1.54	Pakistan	RME
5	-1.48	USA	Italy	-1.60	Brazil	Germany	-1.25	USA	Italy
6	-1.44	USA	Canada	-1.24	USA	Neth	-1.19	USA	Canada
7	-1.11	USA	Neth	-1.18	USA	Canada	-1.16	USA	Neth
8	-1.04	Brazil	Italy	-1.15	Brazil	Italy	-1.08	Brazil	Germany
9	-1.00	Brazil	Germany	-0.97	USA	Italy	-1.00	RFSU	Spain
10	-0.83	India	RNA	-0.94	Brazil	Belgium	-0.94	Brazil	Italy
Rice									
1	-2.24	Pakistan	RME	-2.25	Pakistan	RME	-1.46	Pakistan	RME
2	-0.56	India	UK	-0.31	Pakistan	UK	-0.43	India	UK
3	-0.36	Pakistan	UK	-0.25	India	UK	-0.30	Thailand	RME
4	-0.26	Thailand	RME	-0.23	Thailand	RME	-0.30	Pakistan	UK
5	-0.18	India	RME	-0.08	India	RME	-0.11	India	RME
6	-0.14	RSA	Portugal	-0.08	RSA	Portugal	-0.09	Pakistan	Neth
7	-0.13	Pakistan	France	-0.08	RSA	Neth	-0.09	RSA	Portugal
8	-0.12	Pakistan	Neth	-0.07	Pakistan	USA	-0.08	Thailand	France
9	-0.12	Pakistan	Italy	-0.07	Pakistan	Neth	-0.08	India	France
10	-0.12	Pakistan	USA	-0.06	USA	UK	-0.08	Pakistan	USA
Soy									
1	-1.91	Brazil	Spain	-3.01	Brazil	Neth	-2.46	Brazil	Neth
2	-1.81	USA	Spain	-2.57	Brazil	Spain	-1.90	Brazil	Spain
3	-1.69	Brazil	Neth	-1.60	Brazil	Germany	-1.73	USA	Spain
4	-1.40	USA	Canada	-1.55	USA	Spain	-1.17	USA	Canada
5	-1.05	USA	Neth	-1.19	USA	Neth	-1.10	USA	Neth
6	-1.04	Brazil	Italy	-1.17	USA	Canada	-1.08	Brazil	Germany
7	1.00	Brazil	Germany	-1.15	Brazil	Italy	-0.94	Brazil	Italy
8	-0.83	India	RNA	-0.94	Brazil	Belgium	-0.78	Brazil	Belgium
9	-0.68	Brazil	Belgium	-0.94	Brazil	France	-0.63	Brazil	France
10	-0.68	Brazil	France	-0.75	Brazil	UK	-0.61	India	RNA
Wheat									
1	-1.46	USA	Mexico	-0.92	USA	Mexico	-1.21	USA	Mexico
2	-1.02	USA	Japan	-0.76	Canada	Mexico	-0.81	USA	Italy
3	-0.84	USA	Italy	-0.55	USA	Japan	-0.60	RFSU	Spain
4	-0.75	Canada	Mexico	-0.53	Canada	Japan	-0.53	Russia	Italy
5	-0.62	Canada	Japan	-0.49	USA	Italy	-0.49	Canada	Mexico
6	-0.48	Canada	China	-0.41	RFSU	Spain	-0.32	Canada	Italy
7	-0.40	RFSU	Spain	-0.40	Canada	UK	-0.31	USA	RME
8	-0.39	USA	Spain	-0.36	Canada	China	-0.29	USA	Spain
9	-0.39	Canada	Italy	-0.36	Russia	Italy	-0.27	Russia	Greece
10	-0.34	Russia	Italy	-0.36	Canada	Italy	-0.18	Portugal	Spain