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TRANSBOUNDARY WATERS ASSESSMENT PROGRAMME

TWAP RB Interactive Data Portal

Maija Bertule, UNEP-DHI Partnership





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Centre on Water and Environment

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United Nations Educational, Scientific and Cultural Organization

International Hydrological Programme

United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

ILEC

TWAP RB River Basins Website and Data Portal

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TWAP RB Assessment Report: Status and Trends

The final technical report of the TWAP RB assessment (March 2016). Contains results and results maps for all assessment indicators, as well as integrated analysis accross indicators. The technical report is accompanied by Summary for Policy Makers.

DOWNLOADS

TWAP RB Technical Assessment Report:

- **Full Technical Report** (high-res 205 MB)
- **Full Technical Report** (low-res 27.5 MB)
- **Technical Report without Annexes** (high-res166 MB)
- **Technical Report without Annexes** (low-res 22.7 MB)
- **Annexes** (high-res 39.8 MB)
- **Annexes** (low-res 5.11 MB)

Summary for Policy Makers:

- **Summary for Policy Makers** (high-res 14 MB)
- **Summary for Policy Makers** (low-res 2.5MB)

Chapter downloads:

Table of Contents (high-res 3.9MB) (low-res 1.1MB)

http://twap-rivers.org/

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- HOME
- INTERACTIVE DATA PORTAL
- About TWAP RB
- Transboundary Rivers
- Indicators
- Partners
- Assessment Results
- Sustainability of TWAP RB
- Publications and Press

The water systems of the world - aquifers, lakes, rivers, large marine ecosystems, and open oceans - support the socioeconomic development and wellbeing of humanity and are home to a high proportion of the world's biodiversity. Many of these systems are shared by two or more nations, and these transboundary resources are linked by a complex web of environmental, political, economic and security interdependencies. The interdependencies extend not only across national borders, but also between the different water systems, underlining the need for integrated management of these resources (see how these interlinkages are explored under the 'Indicators' section of this page).

While ecosystem services provided by these systems support the socioeconomic development and wellbeing of much of the world's population, these basins continue to be impacted and degraded by multiple and complex human-induced and natural stresses. Further, management of transboundary waters is increasingly becoming constrained by limited availability of funds, resulting in the need for better prioritization of the allocations of limited financial resources. One of the major constraints to the effective management of transboundary waters is the lack of a systematic, periodic global comparative assessment of their changing conditions in response to changing stresses.

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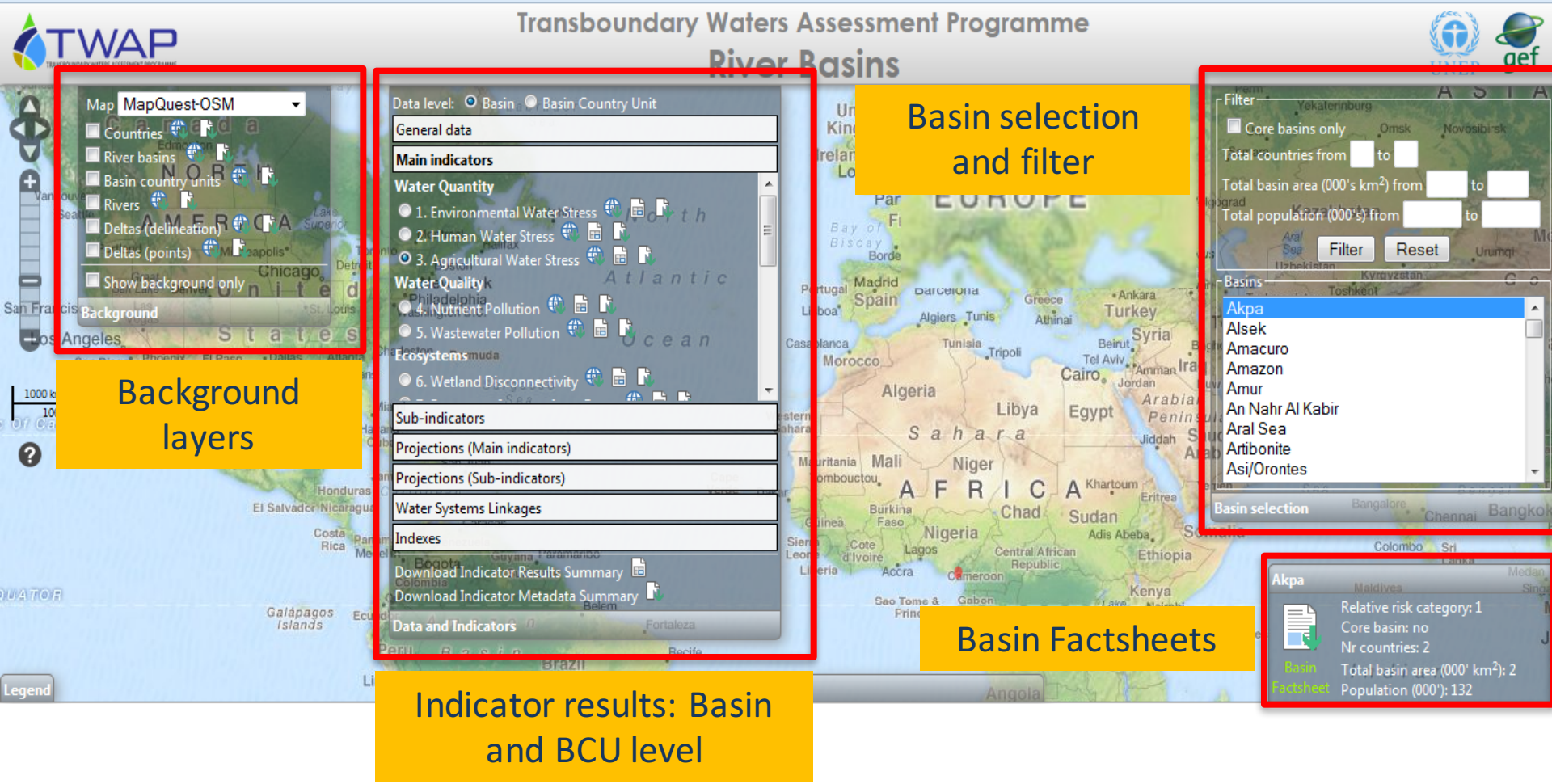
http://twap-rivers.org/

Interactive data portal

- ✓ On-demand assessment results maps: basin, BCU, deltas level
- ✓ Background layers (River basins map, deltas map, etc.)
- ✓ Results summaries
- ✓ User made indices
- ✓ River basin factsheets
- ✓ Results files and metadata sheets

Interface



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On-demand results maps

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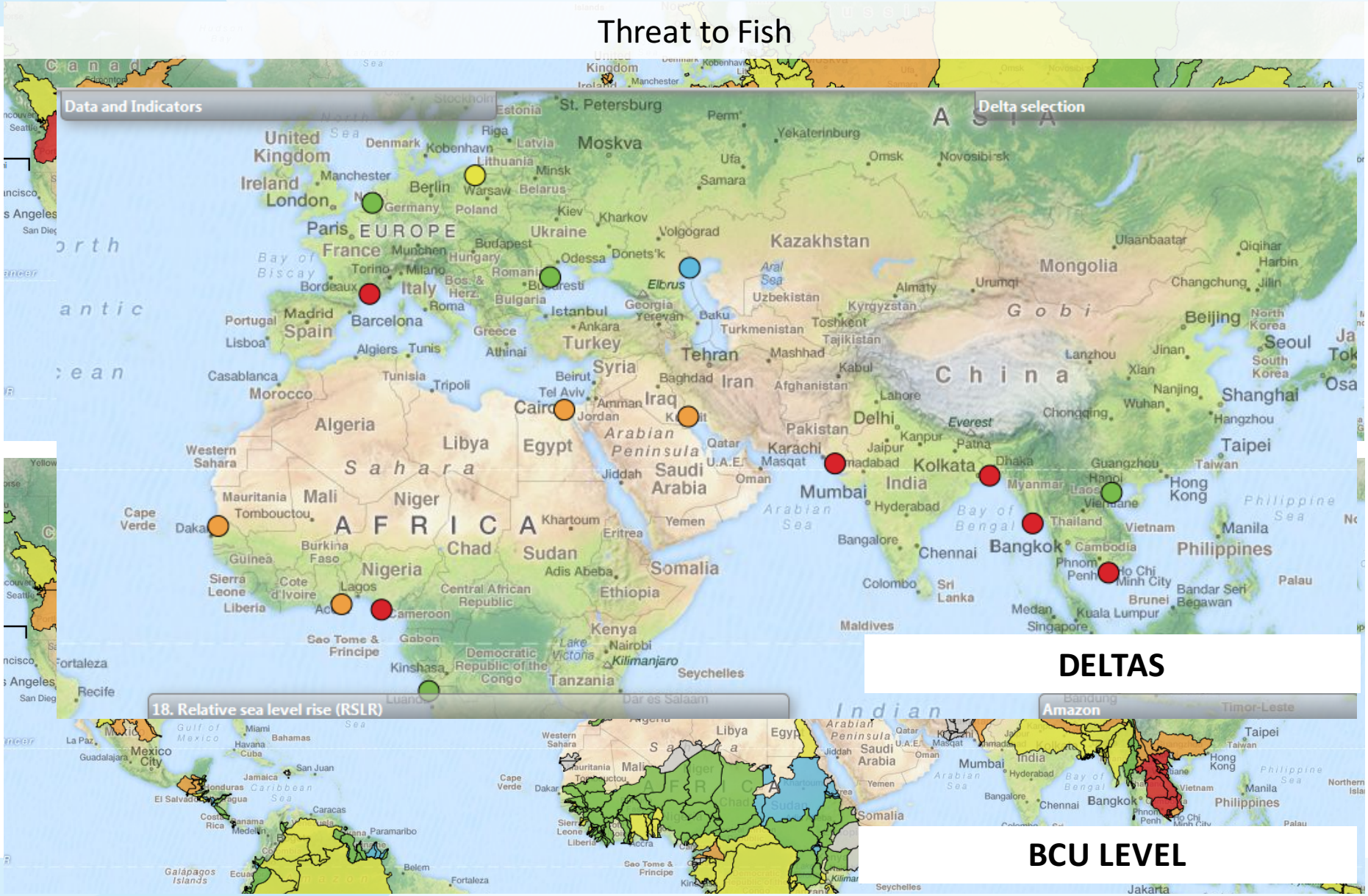
Threat to Fish



Custom made indices

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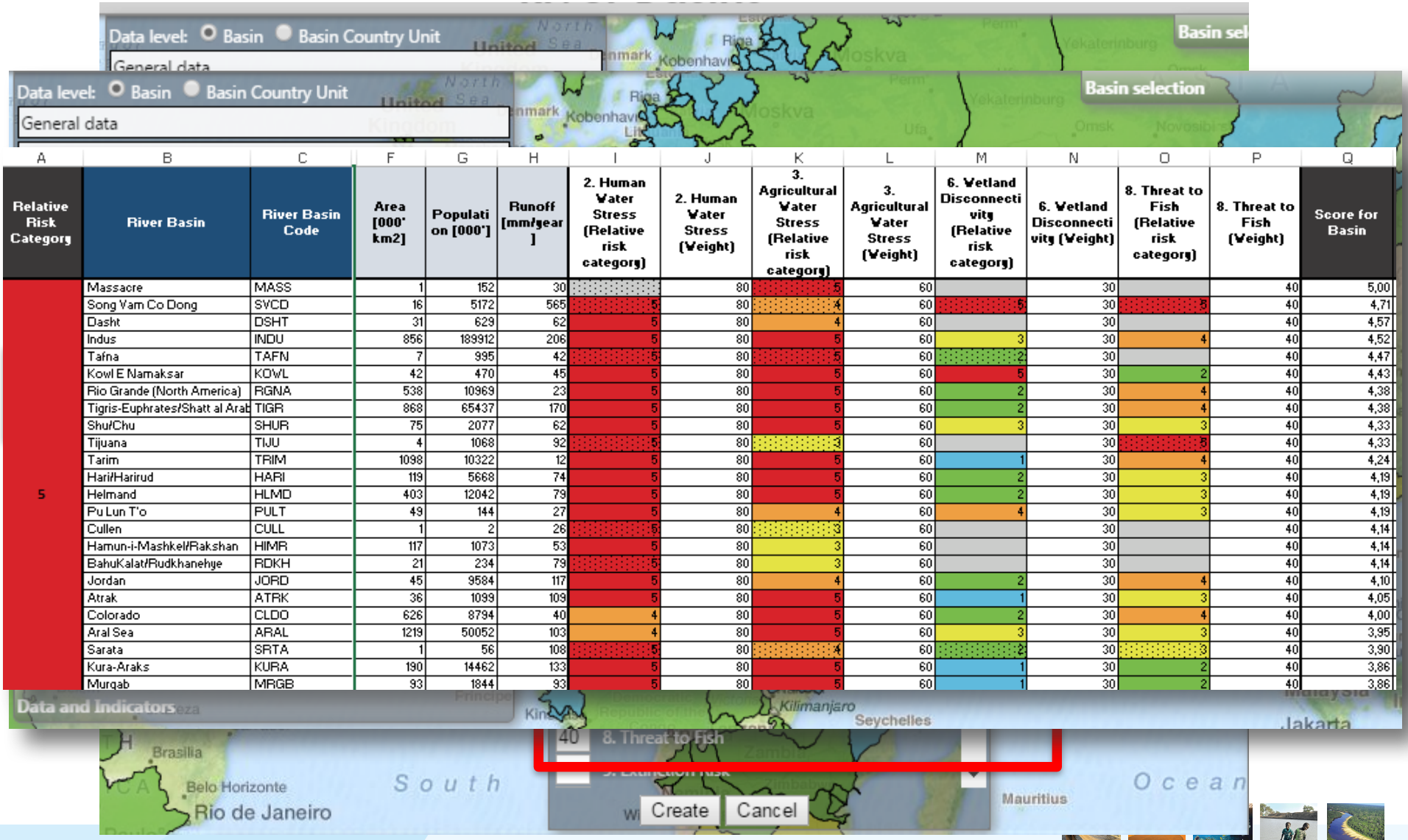

A	B	C	F	G	H	I	J	K	L	M	N	O	P	Q
Relative Risk Category	River Basin	River Basin Code	Area [000* km2]	Population [000*]	Runoff [mm/year]	2. Human Water Stress (Relative risk category)	2. Human Water Stress (Weight)	3. Agricultural Water Stress (Relative risk category)	3. Agricultural Water Stress (Weight)	6. Wetland Disconnectivity (Relative risk category)	6. Wetland Disconnectivity (Weight)	8. Threat to Fish (Relative risk category)	8. Threat to Fish (Weight)	Score for Basin
	Massacre	MASS	1	152	30	5	80	5	60		30		40	5,00
	Song Vam Co Dong	SVCD	16	5172	565	5	80	4	60	5	30	5	40	4,71
	Dasht	DSHT	31	629	62	5	80	4	60		30		40	4,57
	Indus	INDU	856	189912	206	5	80	5	60	3	30	4	40	4,52
	Tafna	TAFN	7	995	42	5	80	5	60	2	30		40	4,47
	Kowl E Namaksar	KOWL	42	470	45	5	80	5	60	5	30	2	40	4,43
	Rio Grande (North America)	RGNA	538	10969	23	5	80	5	60	2	30	4	40	4,38
	Tigris-Euphrates/Shatt al Arab	TIGR	868	65437	170	5	80	5	60	2	30	4	40	4,38
	Shu/Chu	SHUR	75	2077	62	5	80	5	60	3	30	3	40	4,33
	Tijuana	TIJU	4	1068	92	5	80	3	60		30	5	40	4,33
	Tarim	TRIM	1098	10322	12	5	80	5	60	1	30	4	40	4,24
	Hari/Harirud	HARI	119	5668	74	5	80	5	60	2	30	3	40	4,19
5	Helmand	HLMD	403	12042	79	5	80	5	60	2	30	3	40	4,19
	Pu Lun T'o	PULT	49	144	27	5	80	4	60	4	30	3	40	4,19
	Cullen	CULL	1	2	26	5	80	3	60		30		40	4,14
	Hamun-i-Mashkel/Rakshan	HIMR	117	1073	53	5	80	3	60		30		40	4,14
	BahuKalat/Rudkhanehye	RDKH	21	234	79	5	80	3	60		30		40	4,14
	Jordan	JORD	45	9584	117	5	80	4	60	2	30	4	40	4,10
	Atrak	ATRK	36	1099	109	5	80	5	60	1	30	3	40	4,05
	Colorado	CLDO	626	8794	40	4	80	5	60	2	30	4	40	4,00
	Aral Sea	ARAL	1219	50052	103	4	80	5	60	3	30	3	40	3,95
	Sarata	SRTA	1	56	108	5	80	4	60	2	30	3	40	3,90
	Kura-Araks	KURA	190	14462	133	5	80	5	60	1	30	2	40	3,86
	Murqab	MRGB	93	1844	93	5	80	5	60	1	30	2	40	3,86

River Basin Factsheets

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Essequibo Basin

Geography

Total drainage area (km²)	154,175
No. of countries in basin	3
BCUs in basin	ESQB_BRA, ESQB_GUY, ESQB
Population in basin (people)	205,427
Country at mouth	Guyana
Average rainfall (mm/year)	2,174

Governance

No. of treaties and agreements[1]	0
No. of RBOs and Commissions[2]	0

Geographical Overlap with Other Transboundary Sy
(No. of overlapping water systems)

Groundwater	
Lakes	0
Large Marine Ecosystems	1

A BCU (Basin Country Unit) is defined as the portion of a country within a particular river basin.
All BCUs have a BCU code which includes a Basin Code of four letters and a Country Code of three letters: XXXX-XXX

Water Resources

BCU	Annual Discharge (km³/year)	Annual Runoff (km³/year)	Av. Groundwater Recharge (km³/year)	Av. Groundwater Discharge (km³/year)	Lake and Reservoir Surface Area (km²)	Rese
ESQB_BRA						
ESQB_GUY	127.87	1,110.77				
ESQB_VEN	28.56	732.62			25.75	
Total in Basin	156.24	1,013.43			25.75	

Water Withdrawals

BCU	Total (km³/year)	Irrigation (km³/year)	Livestock (km³/year)	Electricity (km³/year)	Manufacture (km³/year)	Domestic (km³/year)	Per capita (m³/year)	Tot as Act Wa
ESQB_BRA								

[1] For details on Treaties and Agreements please see http://www.transboundarywaters.orst.edu/
[2] For details on River Basin Organisations (RBOs) and Commissions please visit http://www.transboundarywaters.orst.edu/

ESQB_GUY	85.45	25.25	2.05	47.09	2	8.78	2,082.23	
ESQB_VEN	35.09	9.06	3.28	0.00	0	22.48	213.52	
Total in Basin	120.54	34.31	5.33	47.09	2.56	31.25	586.76	0.08

Socioeconomic Geography

BCU	Area ('000 km²)	BCU area in basin (%)	Population ('000 people)	Population density (people/km²)	Annual pop. growth (%)	Rural population ratio (% pop. rural)	Urban population ratio (% pop. urban)	Large Cities (>500 ,000)	GDP per capita (USD)	No. of dams	Dam Density (No./000 .000 km²)
ESQB_BRA	0	0.00	0	0.76	0.94			0	11,208.08	0	0.00
ESQB_GUY	115	0.75	41	0.36	0.22	3.59	96.41	0	3,846.53	0	0.00
ESQB_VEN	39	0.25	164	4.22	0.99			0	14,414.75	0	0.00
Total in Basin	154	1.00	205	1.33	1.30	0.72	19.26	0	12,302.78	0	0.00

TWAP RB Assessment Results: BCU and Basin Relative Risk Category per Indicator[3]

Thematic group	Water Quantity			Water Quality			Ecosystems			Governance			Socioeconomics		
BCU	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
ESQB_BRA					5				2	5	3	2	1	3	1
ESQB_GUY	1	1	2		5	3	1	2	2	5	5		4	3	4
ESQB_VEN	1	1	2		5	1	2	2	2	5	3	4	1	2	2
River Basin	1	1	2	2	5	2	1	2	1	5	4		3	4	3

Indicators

1 - Environmental water stress 2 – Human water stress 3 – Agricultural water stress 4 – Nutrient pollution 5 – Wastewater pollution 6 – Wetland disconnectivity 7 – Ecosystem impacts from dams 8 – Threat to fish 9 – Extinction risk 10 – Legal framework 11 – Hydropolitical tension 12 – Enabling environment 13 – Economic dependence on water resources 14 – Societal well-being 15 – Exposure to floods and droughts

TWAP RB Assessment Results: BCU and Basin Relative Risk Category per Projected Indicator

Projected Indicator	1.Environmental water stress		2.Human water stress		4.Nutrient pollution		16.Change in population density		11.Hydropolitical tension
Basin BCU	P-2030	P-2050	P-2030	P-2050	P-2030	P-2050	P-2030	P-2050	Projected
ESQB_BRA									3
ESQB_GUY	2	3	1	1			1	1	5
ESQB_VEN	2	3	1	1			2	3	3
River Basin	2	3	1	1	2	2	1	1	4

[3] Lined (or dotted) cells indicate a lower degree of certainty in results due to global modelling limitations and other gap-filling methods.

TWAP RB Assessment results: Water System Linkages

Thematic group	Lake Influence Indicator	Delta Vulnerability Index			
Basin/Delta	17	18	19	20	21
River Basin	1				

Indicators

17 – Lake influence indicator **18** – Relative sea level rise (RSLR) **19** – Wetland ecological threat **20** – Population pressure **21** – Delta governance

Disclaimer

The results and information of factsheet is produced and maintained by the River Basins Component of the GEF Transboundary Water Assessment Programme (GEF TWAP).

GEF TWAP is the first global-scale assessment of all transboundary water systems. The TWAP consists of five independent indicator-based water system assessments and the linkages between them, including their socioeconomic and governance-related features. The United Nations Environment Programme (UNEP) is the implementing agency of TWAP. Project Coordination Unit (PCU) in Nairobi, Kenya coordinates the work of UNESCO-IHP, ILEC, UNEP-DHI and the IOC of UNESCO on Transboundary Aquifers, Lake Basins, River Basins, Large Marine Ecosystems and Open Ocean respectively. Each executing partner engages a broad network of data and information rich partners with responsibilities either of a thematic or geographic nature. More on TWAP full size project at http://www.geftwap.org .

The TWAP River Basins component (TWAP RB) carried out a global comparison of 286 transboundary river basins, in order to enable the prioritisation of funds for basins at risk from a variety of issues, covering water quantity, water quality, ecosystems, governance and socio-economics. It also considered risks to deltas from threats of a transboundary nature, and considered the relative influence of lakes on these river basins. TWAP RB is an indicator-based assessment, allowing for an analysis of basins, based on risks to both societies and ecosystems. It also includes provisional outlook projections to 2030 and 2050 for a limited number of indicators.
Values given in the present fact-sheet represent an approximate guide only and should not replace recent local assessments.

For more information on data sources, indicator calculation methodologies, limitations and more consult indicator metadata sheets available on TWAP RB Data portal on http://twap-rivers.org .

Other downloads

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River Basins TWAP

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Metadata Sheet: Human Water Stress
(Indicator No.2)

Title:	*Human Water Stress*
Indicator Number:	*2*
Thematic Group:	*Water Quantity*
Rationale:	*Water scarcity is a, if not the, key limit… transboundary basins. Water stress c… demands from different sectors and d… variability. Human water stress has be… Falkenmark (1989, Rijsberman 2006).*
Interlinkages:	*GW (some of the renewable water su… renewable sources), Lakes (this is als… LMEs (indication of the quantity of wa…*
Description:	This indicator deals with the quantity … the internal and upstream area wate… available per person, the greater the … and the less water there is available f… not only by the locally generated … horizontally through river corridors a… Along the way the supply can be with… setting-up constraints on the accessil… water stress. Two (sub)indicators of human water … facets of water supply and water usel… **a) Renewable Water Supply (Sub-In…** **b) Relative Water Use (Sub-Indicato…** All data were computed in 30' latitud… the Geographic projection over the Ti… basin regions.
Metrics:	Center for International Earth Science … University, International Food Policy R… Centro Internacional de Agricultura Tr… Mapping Project, Version 1 (GRUMPv… Socioeconomic Data and Applications … Charles J. Vörösmarty, Pamela Green… Global water resources: Vulnerability … Science 289: 284-288 (In Reports). Charles J. Vörösmarty, C. Leveque, C… Coordinating Lead Authors: Chris Ca… Meybeck, Daniel Prager, 2005. Chapt… Assessment, Volume 1: Conditions ar… Charles J. Vörösmarty, Ellen M. Doug… Geospatial Indicators of Emerging Wa… (3): 230-236, 2005b. Malin Falkenmark. "The massive wate… addressed." Ambio 18, no. 2 (1989): 1… Malin Falkenmark. "Rapid Population …

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	RIVER BASIN	RIVER BASIN CODE	Area [000' km2]	Population [000']	Runoff [mm/year]	Discharge [km3/year]	1. Environmental Water Stress	2. Human Water Stress	3. Agricultural Water Stress	4. Nutrient Pollution	5. Wastewater Pollution	6. Wetland Disconnectivity	7. Ecosystem Impacts from Dams	8. Threatte Fish	9. Extinction Risk
2	Indus	INDU	856	189912	206	176,38	4	5	5	4	5	3	4	4	3
3	Tarim	TRIM	1098	10322	12	13,30	5	5	5	2	5	1	4	4	3
4	Ganges-Brahmaputra-	GANG	1652	704221	860	1420,98	4	3	3	5	5	4	4	4	3
5	Tafna	TAFN	7	995	42	0,30	5	5	5	5	4	2	3		3
6	Kaul E Namakzar	KOWL	42	470	45	1,89	5	5	5	3	5	5	3	2	3
7	Song Vam Co Dong	SVCD	16	5172	565	8,77	2	5	4	4	5	5	3	5	2
8	Tigris-Euphrates/Shatt	TIGR	868	65437	170	147,67	4	5	5	3	4	2	5	4	3
9	Vardar	VRDR	25	2126	303	7,44	3	4	3	4	5	1	5	3	2
10	Dasht	DSHT	31	629	62	1,91	5	5	4	2	5				3
11	Saigan	SAIG	30	10911	1158	34,32	2	2	2	4	5	2	4	5	2
12	Medjerda	MDJD	23	2554	106	2,46	5	4	4	4	4	2	5	2	3
13	Jordan	JORD	45	9584	117	5,28	5	5	4	5	2	2	5	4	3
14	Helmand	HLMD	403	12042	79	31,83	5	5	5	3	5	2	3	3	2
15	Hari/Harirud	HARI	119	5668	74	8,87	5	5	5	3	5	2	3	3	2
16	Aral Sea	ARAL	1219	50052	103	126,09	4	4	5	2	5	3	4	3	3
17	Hamun-i-Marhkel/Rak	HIMR	117	1073	53	6,16	5	5	3	2	5				3
18	Kura-Araks	KURA	190	14462	133	25,28	4	5	5	3	5	1	5	2	3
19	Artibanite	ATBN	9	1456	307	2,72	2	2	2	4	5	4	2		3
20	Muhuri (aka Little Feni	MHRI	4	3313	1320	5,00	3	3	2	5	5	4	4	3	2
21	Murgab	MRGB	93	1844	93	8,65	5	5	5	2	5	1	3	2	3
22	Shu/Chu	SHUR	75	2077	62	4,68	3	5	5	2	5	3	4	3	3
23	Drin	DRIN	17	1766	869	15,03	2	1	2	4	5		5	5	5
24	Limpopo	LMPO	407	15159	47	19,20	3	4	3	5	4	2	5	2	1
25	Bei Jiang/Hri	HSIX	401	77098	726	291,06	2	3	2	5	5	2	4	4	3
26	Bahu Kalat/Rudkhaneh	RDKH	21	234	79	1,62	4	5	3	2	5				3
27	Mazzaro	MASS	1	152	30	0,02	2		5	4	5				3
28	El Naranja	ELNA	0	1	-1	-1,00					5				
29	Tijuana	TIJU	4	1068	92	0,41	5	5	3	5	3		4	5	4
30	Mekong	MEKO	773	58743	647	500,39	2	2	2	3	5	3	3	5	4
31	San Juan	SJUA	41	3443	1213	50,18	1	1	2	3	5	5	3	2	3
32	Lake Prespa	LKPP	8	601	599	4,51	2	2	3	4	5		4	3	3
33	Irrawaddy	IRWD	375	28583	1470	551,76	2	1	2	3	5	3	3	3	3
34	Ili/Kunes He	ILIX	415	5184	55	22,71	3	4	4	3	4	2	3	4	3
35	Awash	AWSH	152	16317	167	25,39	2	3	2	3	5	3	4	2	2
36	Chira	CHIR	18	697	193	3,42	4	4	3	3	5	1	4	2	3
37	Atui	ATUI	83	100	7	0,61	4	5	1	3					2
38	Rio Grande (North Ame	RGNA	538	10969	23	12,11	5	5	5	3	3	2	5	4	1
39	Lake Chad	LKCH	2597	44036	74	191,79	2	1	2	3	5	4	3	2	2

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