

WATER  
COOPERATION  
QUOTIENT



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## PREFACE

For more than half a decade, Strategic Foresight Group has been engaged in research and parallel diplomacy exercises pertaining to trans-boundary water issues. We have been involved in finding solutions to the trans-boundary problems in the Eastern Himalayan region, the Middle East and parts of Africa. We have also initiated a process for creating a global architecture for using water as an instrument of peace. We have crafted the Blue Peace framework, which in a structured way provides a process for using water as a source of regional cooperation and development rather than a source of potential crises.

With experience of three difficult regions of the world, in November 2013 we made a first effort to create Water Cooperation Quotient as a tool to measure intensity of cooperation in shared river basins. The report introducing the Quotient was launched by HRH Prince Hassan bin Talal who was then the Chairman of the United Nations Secretary General's Advisory Board on Water and Sanitation.

As the report was circulated worldwide, we received many useful suggestions for improving the Water Cooperation Quotient methodology. I am pleased to present the refined Water Cooperation Quotient in this publication. I appreciate that there could be scope to refine and reshape it further. However, we can at least begin using it for making an effort for comparative understanding of degrees of active cooperation in shared water bodies around the world.

Our original work in preparing Water Cooperation Quotient, launched in November 2013, was supported by Swedish International Development Cooperation Agency (Sida). Our work in crafting the Blue Peace concept, which is the philosophical fountain of the Water Cooperation Quotient, has been supported by the Swiss Agency for Development and Cooperation (SDC). We have gained tremendously, in particular intellectually but also otherwise, from our cooperation with Sida and SDC, as well as the Liberal Democratic Party in the House of Lords of the UK Parliament, and several other institutions.

However, the present paper is an independent study by Strategic Foresight Group without involvement or support of any government, agency, or institution. We are

therefore solely responsible for its contents and our analysis should not be interpreted to reflect thinking of any of our long term partners.

We would very much appreciate suggestions and comments, which will enable us to sharpen and refine this tool in the future. In the meanwhile, we very hope that countries will use the Water Cooperation Quotient as a policy instrument to understand, define and construct their relations with their neighbours and to derive geopolitical advantages that they can accrue from a higher score on the Water Cooperation Quotient.

SUNDEEP WASLEKAR  
President

April 2015

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## ACRONYMS AND ABBREVIATIONS

ACTO	Amazon Cooperation Treaty Organization
ARBCC	Amur River Basin Coordination Committee
ASEAN	Association of South East Asian Nations
CCNR	Central Commission on the Navigation on Rhine
CIC	Intergovernmental Coordinating Committee of the Countries of La Plata Basin
CILA	International Commission on Limits and Water between Mexico-Guatemala
CIPEL	International Commission for the Protection of Lake Geneva-Rhone
CPRTW	The Joint Russian-Belarusian Commission for Protection and Rational Use of Transboundary Water Bodies
DCG	Drin Core Group
ECOWAS	Economic Community of West African States
EU	European Union
EUWFD	European Union Water Framework Directive
Finnish-Norwegian TWC	Finnish-Norwegian Trans-boundary Water Commission
FRC	Swedish Frontier River Commission
HRDC	Helmand River Delta Commission
IBWC	International Boundary and Water Commission between US and Mexico
ICPDR	International Commission for the Protection of the River Danube
ICPOAP	International Commission for the Protection of the Oder River against Pollution
ICPR	International Commission for the Protection of the Rhine
ICWC	Interstate Commission for Water Coordination of Central Asia
IDBC	International Dnieper Basin Council
IFAS	International Fund for Saving the Aral Sea
IJC	International Joint Commission
ISRBC	International Sava River Basin Commission
IWRM	Integrated Water Resource Management
JBWC	Joint Boundary Water Commission between Turkey and Georgia
JCUPT	Joint Russian- Kazakhstan Commission for Utilization and Protection of Transboundary Waters



JCW	Joint Commission on the Utilization of Frontiers Waters
JRC	Joint River Commission between India and Bangladesh
JRWA	Johor River Water Agreement between Malaysia and Singapore
JTC ET	Joint Technical Committee between Iraq-Syria-Turkey on Euphrates Tigris
JWC Israel and Jordan	Joint Water Commission between Israel and Jordan
LVBC	Lake Victoria Basin Commission
MRC	Mekong River Commission
MTCP	Malaysia and Thailand Collaboration Project
NBA	Niger Basin Authority
NBI	Nile Basin Initiative
OAS	Organization of American States
OKACOM	The Permanent Okavango River Basin Water Commission
OMVG	Gambia River Basin Development Organization
OMVS	Organisation pour la Mise en Valeur du fleuve Sénégal
ORASECOM	Orange-Senqu River Commission
OSS-NWSAS	Sahara and Sahel Observatory-The North-Western Sahara Aquifer System
PGA Commission	The Permanent Greek-Albanian Commission on Transboundary Freshwater Issues
PIC	Permanent Indus Commission
Polish-Slovak TWC	The Polish-Slovak Transboundary Waters Commission
RBC	River Basin Commission
RBO	River Basin Organization
SADC	Southern African Development Community
SICA-PACADIRH	The Central American Integration System-Action Plan for Integrated Management of Water Resources
Polish-Ukrainian TWC	The Polish-Ukrainian Transboundary Waters Commission
UN	United Nations
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
VBA	Volta Basin Authority
ZAMCOM	Zambezi Watercourse Commission

# **WATER & WAR EQUATION**



**ANY TWO  
COUNTRIES  
ENGAGED  
IN ACTIVE  
WATER  
COOPERATION**

**DO NOT GO  
TO WAR FOR  
ANY OTHER  
REASON**

# INTRODUCTION

“Many of today’s conflicts around the world are being fuelled or exacerbated by water shortages and climate change is only making the situation worse”, Secretary-General Ban Ki-moon told the General Assembly on 6 February 2008. He repeated his warning several times.

While speaking on the occasion of World Water Day 2013, the Secretary General said, “Water scarcity threatens economic and social gains ... And it is a potent fuel for wars and conflict.”

Secretary General Ban Ki-moon’s warnings are reflected in the official definition of water security provided by the United Nations University- IWEH, which says “The capacity of a population to safeguard sustainable access to adequate quantities of and acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability.” It is important to note the emphasis on “in a climate of peace and political stability” in this definition.

The concerns of the United Nations are justified as the world faces an era of depleting water resources. The World Water Development Report of UNESCO, released in March 2015 warns us of serious depletion of water supplies by 2050, while at the same time, significant increase in demand due to population growth, economic development and urbanisation, among other factors.

The total annual renewable water resources available in the world are estimated to be around 38,000 BCM in 2015. The total water withdrawal in this year is expected to be 3800 BCM. Thus, it may appear that only 10 per cent of the available resources are abstracted. However, if one examines the situation beneath the surface, we would notice serious problems.

First, the rate of water extraction is uneven around the world. It is less than 10 per cent in some parts, but it exceeds 40 per cent in other parts and even 100 per cent in a few places. Thus, there are many regions where people are water stressed.

Secondly, total water withdrawal is expected to increase from 3800 BCM in 2015 to 5700 BCM by 2050. Most of this increase in abstraction will take place in water stressed geographies. Out of 9 billion people expected to inhabit the planet in 2050, about 3.5 billion will be living in water stressed areas where withdrawal of water will be more than 40 per cent of the availability.

The crisis of supplies is most vividly illustrated by the shrinking of lakes and seas. Water bodies, which have been around for millennia, have suddenly started experiencing depletion in the last 50 years. These include Dead Sea and Urmia Lake in the Middle East, Chad Lake and Turkana Lake in Africa, Aral Sea in Central Asia, Hongjiannao Lake in China, Lake Chapala in South America among others. In the case of most of these lakes and seas, more than 30 per cent surface area has

been lost in the last 50-60 years. At this rate, there is a risk of many of these lakes turning into ponds by 2015. Besides, many small lakes have completely disappeared.

It is much more difficult to have reliable estimates of reduction in water flow of the rivers. This is because of strong fluctuations in the quantity of flow from one season to another and from one year to another. It is known that many medium and small rivers have turned into streams in several parts of the world. Moreover, rampant pollution of rivers makes significant portion of the abstracted water unusable for life systems.

Climate change is expected to worsen the situation. Many climate scientists expect average global temperature to increase by anywhere from 1 degree to 5 degrees Celsius in the 21st century. Even a small increase of 1 degree Celsius by 2050 can accentuate the erratic nature of weather patterns. This will lead to heavy precipitation and long droughts in an unpredictable manner. As a result, while average water availability in any given year and in any given region might seem manageable, there will be shortages in specific periods and specific regions.

In such a situation, there will be only two alternatives- conflict or cooperation. Business as usual will not work for too long. UN Secretary General Ban Ki-moon once said, "Water is a classic common property resource. No one really owns the problem. Therefore, no one really owns the solution." He therefore argues that the solutions have to come through international cooperation. There is no other option.

It is necessary to be clear about what we mean by cooperation. Merely signing treaties for allocation of water resources between riparian countries is not cooperation. Even signing treaties which go beyond allocation and provide for exchanges and joint ventures is also not cooperation. For cooperation to be meaningful, it must be active in an operational way.

This paper proposes how to measure intensity and operational strength of trans-boundary cooperation in the water sector. This is done by constructing Water Cooperation Quotient based on certain parameters. The parameters are drawn from the experiences of River Basin Organisations which are respected all over the world for successfully implementing water cooperation arrangements.

We understand that such assessment is bound to have a degree of subjective element. It is also likely to suffer from less than optimum data, affecting assessment of some of the cooperation arrangements. The presentation of Water Cooperation Quotient in the present form is therefore the beginning of an effort to introduce comparative assessment of water cooperation efforts.

We believe that it is necessary to begin with a tool which may have some scope to be refined by experts from all over the world in the future, at a time when such a tool does not exist at all and is badly needed. The policy makers can use Water Cooperation Quotient to identify gaps in the cooperative mechanisms and improve their strategies and methods of cooperation. The Quotient can help policy makers not only to strengthen the already existing regional cooperation mechanisms but also establish ones where none currently exist.



The value of the Water Cooperation Quotient is not limited to the water sector. Our survey of the state of peace and stability around the world in March 2015 indicates a high correlation between a high score on water cooperation quotient and low incidence of war and conflict. Indeed, any two countries engaged in active water cooperation, do not go to war for any other reason.

It must be understood that the Water Cooperation Quotient is a dynamic indicator. It changes in time as per the ground realities. Two countries cooperating in a particular period may discontinue their cooperation in another period. Also, the countries that have not cooperated earlier may decide to enter into active water cooperation. The data presented in this report is a snap shot of the current situation in 2015. It would be valuable to review the quotient for all countries in two or three years.

# CHAPTER I

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## SCOPE OF THE STUDY AND DEFINITIONS

### SCOPE OF THE STUDY

In order to devise the link between water cooperation and war the following were studied:

**Total Number of UN member nations and observer states: 195**

**Number of countries with shared watercourses: 148** countries

**Number of countries at war or having the risk of war: 27**

**Number of Shared Watercourses:**

Rivers and lakes: **219**

Aquifers: **6**

Adequate information unavailable for **44** shared watercourses

Total number of Shared/Transboundary/International lake and river basins in the world: **263**

**Time Period:** This report is situated in a specific time frame **EARLY 2015**.



## DEFINITIONS

### WAR

**War is defined as per Geneva Convention IV of 1949 to be:**

“Any difference arising between two States and leading to the intervention of members of the armed forces...”

(Convention (IV) relative to the Protection of Civilian Persons in Time of War, 12 August 1949. Commentary – Article 2. Part I: General provisions.)

#### **Explanation:**

There must be protracted and intense armed hostilities between two nations for it to be called a war within the aforementioned definition.

### RISK OF WAR

1. Existence of a point of contention and absence of effective dispute resolution mechanisms to address it, over which at least one state from time to time has threatened an intervention of its armed forces.
2. Involvement of state authorities of Country X to assist the armed non-state actors in or fighting against country Y, to the extent that Country Y lodges a strong protest with the international community or threatens military action against Country X.
3. Any event that could result in significant loss of life, where the countries involved consider such loss “significant” in their own perception, to the extent that they threaten intervention of their armed forces.

#### **Explanation:**

- Indication of threat is considered to be delivered by a country if it is articulated by Head of Government, serving Cabinet Minister, or official advisor to the Head of Government or the official spokesman of the concerned government.
- The risk of war between nations is calculated for a time frame of five years as this is the average life of a government in most countries and often the period after which major policy changes may be made.
- Nations/States: Any recognised member or non-member with observer state status with the United Nations.
- Armed Non State Actors (ANSA): Organised armed entities that are willing and capable of using violence in pursuit of their political goals and are not a part of any formalized State institutions.

### REASON

The reason to go to war may or may not be related to water and may include factors such as land, ideology, rivalry for supremacy amongst others.



## ACTIVE WATER COOPERATION (AWC)

Active water cooperation is the commitment of countries to jointly manage their shared water resources and this report has quantified the same. Countries that have scored above 18.18 are said to have been engaged in Active Water Cooperation.

### **Explanation:**

The cooperation between countries is fortified legally. Several countries have strengthened the same by collectively working jointly towards the management of water sources and implementing the measures for environmental protection. The extent of the commitment of these countries extends to greater political involvement sometimes at the level of the heads of state.

### Note:

- There is no global consensus on the term to be used to refer to a water source (rivers/lakes/aquifer) that flows from one country to another. Transboundary, international, shared are some of the ways that countries characterise these water bodies. For the purposes of this report shared watercourse is uniformly used to refer to these bodies.
- Nations that have shared watercourses are referred to as riparians.



## CHAPTER 2

# METHODOLOGY

In order to quantify Active Water Cooperation between nations, their Water Cooperation Quotient (WCQ) has been devised.

The WCQ is a set of ten indicators that help determine and quantify the extent of collaboration between two or more countries with shared watercourses. These indicators have been arrived at after an in-depth analysis of the functioning of all the available cooperative mechanisms (bilateral/multilateral) established for the shared watercourses. The indicators have been ranked and the corresponding score signifies their ranking. The ranking of the indicators is determinative of the commitment levels of the riparian countries towards water cooperation. The lowest level of commitment has been scored at 1 with a minimum of a cooperation agreement. An intermediate level of commitment has been scored at 5, which includes quality control measures. The highest level of commitment has been scored at a 10 with an actual functioning of the cooperation mechanism that are established by the countries. The total of the scores comes to 55.

### INDICATORS AND THEIR SCORE

#### AGREEMENT

In order to lay a foundation for water cooperation, it is seen that Riparian nations enter into formal legal arrangement with definitive provisions for the future.

SCORE  
1

#### COMMISSION

Riparian nations also establish institutions to govern their shared watercourses which are often referred to as River Basin Commissions (RBC) or River Basin Organization (RBO). The decision making authority on water allocation and resource management is often submitted to such institutions. However, The institutional design as well as functions differs from basin to basin as per their individual requirements.

SCORE  
2

#### MINISTERIAL MEETINGS

When water cooperation is a matter of priority, nations engage at the ministerial level. This is reflected in ministerial meetings which may happen on an annual/bi-annual basis or as and when required. It is also seen that such meetings are a part of the institutional mandate of RBO/RBCs.

SCORE  
3

## TECHNICAL PROJECTS

Nations often engage in technical projects in relation to their shared watercourse such as irrigation, capacity building, sustainable development and livelihood programmes, fisheries, energy, navigation etc. It is to be noted that these projects are not those that are carried out by individual nations domestically but are those that are either basin wide or international in nature and are often implemented by or through RBO/RBCs or jointly by nations.

SCORE  
4

## ENVIRONMENTAL PROTECTION AND QUALITY CONTROL

Riparian nations face several environmental issues relating to or affecting their shared watercourses such as water pollution, soil erosion, invasive crop species, sedimentation, deforestation and the like. Nations choose to work together to mitigate these factors by introducing environmental protection, monitoring or quality control programmes or projects such as warning or alarm systems to prevent extreme pollution, environment impact assessment, ecosystem management, climate change adaptation strategies and the like.

SCORE  
5

## JOINT MONITORING OF WATER FLOWS

Monitoring the quantity of a shared water course as well as ensuring that all riparians are able to obtain this data, is often a contentious issue between the riparian nations for various reasons including security concerns. Nevertheless, it is seen that riparian countries are working together to jointly monitor water flows by establishing monitoring stations or harmonising flow collection data. RBOs/RBC also plays a major role in this process.

SCORE  
6

## FLOODS, DAMS AND RESERVOIR

Infrastructure related planned development such as dams and reservoirs in border areas as well as flood management require an active collaboration and transparency on the part of riparian countries in a way that takes into account the interest of all relevant riparian countries and not merely the host country of the concerned project. Hence countries often engage in processes such as notification, consultation and negotiation with their co-riparians while planning such infrastructure.

SCORE  
7

## HIGH POLITICAL COMMITMENT

Riparian nations commit to cooperate at the highest political level such as the Heads of Governments. In certain cases it is also seen that such a commitment becomes a part of the institutional design of the RBO itself wherein an annual or quarterly summit of the Heads of the States for the shared watercourse is mandated.

SCORE  
8

## INTEGRATION INTO ECONOMIC COOPERATION

Countries expand the scope of water cooperation and work towards integrating the same with regional economic cooperation. It is also seen that a regional economic body may also work towards ensuring water cooperation through expanding its mandate.

SCORE  
9



### ACTUAL FUNCTIONING

When determining whether an institutional mechanism is actually functioning, certain factors were taken into consideration such as:

- Whether the countries are engaged in implementing the provisions of the water cooperation agreement that they have decided upon.
- Whether the plans and projects are not only on paper but are also executed within a certain set deadline.
- Whether all riparians are involved in the basin management.

**SCORE**  
**10**

There must be information available from open sources that indicates that the concerned cooperation mechanism is functioning efficiently and with the dedicated participation of the countries.

**TOTAL SCORE** **55**

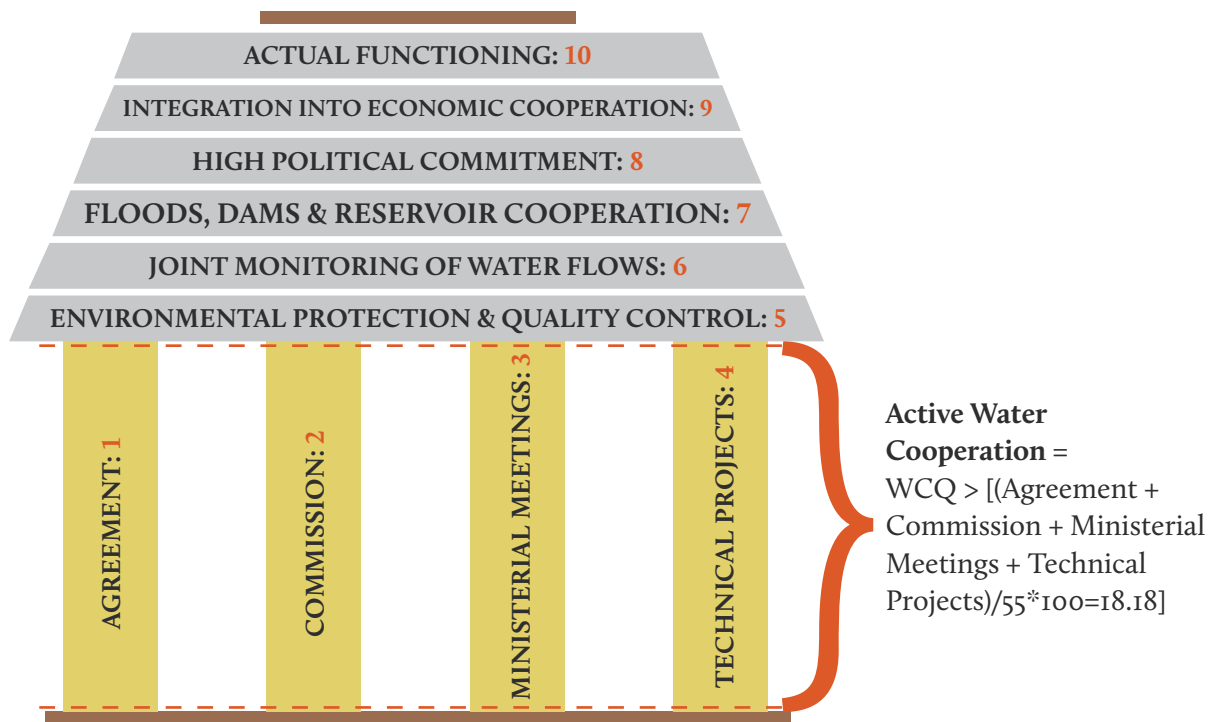
Each cooperative mechanism gets scored under each indicator depending on whether it exhibits the conditions mentioned in Table I. The total score thus arrived at is converted to a percentage which represents its respective Water Cooperation Quotient (WCQ).

$$WCQ = (TOTAL\ SCORE / 55) \times 100$$

GIVEN BELOW ARE SOME EXAMPLES OF WATER COOPERATION MECHANISM AND THEIR CORRESPONDING WCQ

Bilateral / Trilateral Treaty, RBO / RBC				
	Organisation pour la Mise en Valeur du fleuve Sénégal (OMVS) (Senegal, Mauritania, Mali, Guinea)	Lake Chad Basin Commission (Cameroon, Central African Republic, Chad, Niger, Nigeria)	Joint Water Committee (Aquifers) (Israel and Palestine)	Joint Technical Committee between Iraq-Syria-Turkey on Euphrates Tigris Basin (JTC ET Basin) (Iraq, Syria, Turkey)
Agreement	1	1	1	1
Commission	2	2	2	-
Ministerial Meetings	3	3	3	-
Technical Projects	4	4	-	-
Environmental Protection & Quality Harmonization	5	5	-	-
Joint Monitoring of Water Flows	6	-	-	-
Flood, Dam, Reservoir Cooperation	7	-	-	-
High Political Commitment and/or Involvement of HOGs	8	-	-	-
Integration into Economic Development	9	9	-	-
Actual Functioning of Mechanism	10	-	-	-
<b>Total Score</b>	<b>55</b>	<b>24</b>	<b>6</b>	<b>1</b>
<b>WCQ</b>	<b>100</b>	<b>43.63</b>	<b>10.91</b>	<b>1.81</b>





## ACTIVE WATER COOPERATION

In order to determine whether the countries are actively cooperating on water a benchmark was laid down. When the study was conducted it was seen that at the most basic level, the riparian nations have the first four indicators that are mentioned above. These countries are able to cooperate on water by entering into an agreement. They tend to institutionalize their cooperation as well as give it a priority at a ministerial level. These countries even have joint technical projects. However, the presence of the four indicators alone does not signify Active Water Cooperation. The countries are said to be engaged in active water cooperation when their cooperative arrangement exceeds score of 18.18. This means that the commitment to cooperate transcends the four indicators.

Active Water Cooperation does not mean mere signing of a treaty for the allocation of water or for data exchange or for establishing a river basin organisation unless there is verifiable joint management of water resources. For instance, the following DO NOT meet the criteria of active water cooperation

- Permanent Indus Commission between India and Pakistan. This is because the mechanism is only about allocation of rivers. There are no elements of joint management over this shared water source between the two countries.
- Joint Water Committee between Israel and Palestine that governs transboundary aquifers. The legal arrangement governing the aquifers are not being implemented nor are there any joint endeavours to govern the shared watercourse between the nations with the help of the Joint Water Committee.

## CHAPTER 3

# ACTIVE WATER COOPERATION AND RISK OF WAR

### EUROPE

COUNTRY	COOPERATION DETAILS	WATER COOPERATION QUOTIENT	WAR,RISK OF WAR
Portugal	European Union Water Framework Directive (EUWFD)	94.54	No
Spain	EUWFD	94.54 with EUWFD	No
France	EUWFD, International Commission for the Protection of the Rhine (ICPR), International Commission for the Protection of Lake Geneva-Rhone(CIPEL)	100.00 with ICPR, 94.54 with EUWFD, 94.54 with CIPEL	No
United Kingdom of Great Britain and Northern Ireland(U.K)	EUWFD	94.54	No
Norway	Finnish-Norwegian Trans-boundary Water Commission(Finnish-Norwegian TWC)	74.54 with Finnish-Norwegian TWC	No
Sweden	EUWFD, Finnish Swedish Frontier River Commission(FRC)	94.54 with EUWFD, 74.54 with Finland	No
Finland	EUWFD, Finnish-Norwegian TWC , FRC, Finnish-Russian Joint Commission on the Utilization of Frontiers Waters(JCW)	94.54 with EUWFD, 74.54 with Finnish-Norwegian TWC and FRC, 100.00 with JCW	No
Denmark	EUWFD	94.54 with EUWFD	No
Netherlands	EUWFD, ICPR	94.54 with EUWFD, 100.00 with ICPR	No
Germany	EUWFD, International Commission for the Protection of the River Danube(ICPDR), International Commission for the Protection of the Oder River against Pollution(ICPOAP), ICPR	94.54 with EUWFD, ICPOAP and ICPDR, 100.00 with ICPR	No





- Water Cooperation Quotient between 0 and 18.18
- Water Cooperation Quotient between 18.19 and 100
- Water Cooperation Quotient between 0 and 18.18 with one or more neighbours and between 18.19 and 100 with others
- Risk of war with at least one neighbouring country
- No data or No shared surface water



Belgium	EUWFD, ICPR	100.00 with ICPR, 94.54 with EUWFD	No
Luxembourg	EUWFD, ICPR	100.00 with ICPR, 94.54 with EUWFD	No
Liechtenstein	EUWFD, ICPR	94.54 with EUWFD, 100.00 with ICPR	
Switzerland	ICPR, ICPDR, ICPOAP, CIPEL	100.00 with ICPR, 94.54 with ICPDR, ICPOAP, and CIPEL	No
Italy	EUWFD	94.54 with EUWFD, NA with San Marino	No
San Marino		NA with Italy	No
Austria	EUWFD, ICPDR, ICPR	94.54 with EUWFD, and ICPDR, 100.00 with ICPR	No
Poland	EUWFD, ICPDR, ICPOAP, The Polish-Ukrainian Transboundary Waters Commission(Polish-Ukrainian TWC), The Polish-Slovak Transboundary Waters Commission (Polish-Slovak TWC)*	94.54 with EUWFD, ICPDR and ICPOAP, 52.73 with Polish-Ukrainian TWC, 34.55 Polish-Slovak TWC	No
Czech Republic	EUWFD, ICPDR, ICPOAP	94.54 with EUWFD, ICPDR and ICPOAP	No
Slovakia	EUWFD, ICPDR and ICPOAP, (Polish-Slovak TWC)*	94.54 with EUWFD, ICPDR and ICPOAP, 34.55 with Polish-Slovak TWC	No
Slovenia	EUWFD, ICPDR, International Sava River Basin Commission (ISRBC)	94.54 with EUWFD, ICPDR, 69.09 with ISRBC	No
Hungary	EUWFD, ICPDR	94.54 with EUWFD, and ICPDR	No
Croatia	ICPDR, ISRBC	94.54 with ICPDR, 69.09 with ISRBC	No
Bosnia-Herzegovina	ICPDR, ISRBC	94.54 with ICPDR, 69.09 with ISRBC	No
Serbia (Yugoslavia)	ICPDR, ISRBC	94.54 with ICPDR, 69.09 with ISRBC	No
Montenegro	ICPDR, Drin Core Group(DCG)	94.54 with ICPDR, 45.45 with DCG	No
Albania	ICPDR, DCG, The Permanent Greek-Albanian Commission on Transboundary Freshwater Issues (PGA Commission), Lake Ohrid Management Board	94.54 with ICPDR, 45.45 with DCG, 32.73 with PGA Commission , 70.90 with Macedonia	No
Macedonia, FYR	DCG, Lake Ohrid Management Board	45.45 with DCG, 70.90 with Albania	No
Bulgaria	EUWFD, ICPDR, Expert Working Group on Cooperation on Water and Environment, Joint Declaration of the Minister of Environment and Water of the Republic of Bulgaria and the Minister of Forestry and Water Affairs of the Republic of Turkey on Cooperation in the field of Water Resources	94.54 with EUWFD and ICPDR, 21.82 with Greece, 30.91 with Turkey	No



Romania	EUWFD, ICPDR	94.54 with EUWFD and ICPDR	No
Republic of Moldova	ICPDR, Agreement between the Government of the Republic of Moldova and the Government of Ukraine on the Joint Use and Protection of the Cross-Border Waters	94.54 with ICPDR, 65.45 with Ukraine	No
Belarus	International Dnieper Basin Council(IDBC), The Joint Russian-Belarusian Commission for Protection and Rational Use of Transboundary Water Bodies(CPRTW)**	47.27 with IDBC; 14.45 with Russia,	No
Latvia	EUWFD, Latvia-Lithuania Cross Border Cooperation Programme(BCP)	100.00 with Latvia and Lithuania, 94.54 with EUWFD, NA with Russia++	No
Lithuania	EUWFD, BCP	100.00 with BCP, 94.54 with EUWFD	No
Estonia	EUWFD, Estonian-Russian Joint Commission on the Protection and Sustainable Use of Transboundary Waters	94.54 with EUWFD, 56.36 with Russia	No
Armenia		0.00 with Azerbaijan #	Yes with Azerbaijan
Azerbaijan		0.00 with Armenia #	Yes with Armenia
Georgia	Joint Boundary Water Commission between Georgia and Turkey	80 with Turkey, 0.00 with Russia	Yes with Russia
Greece	EUWFD, Drin Core Group, Expert Working Group on Cooperation on Water and Environment between Greece and Bulgaria , PGA Commission, Joint Declaration between the Minister for Environment, Energy and Climate Change of the Hellenic Republic and the Minister for Environment and Forestry of the Republic of Turkey	94.54 with EUWFD, 45.5 with Drin Core Group, 21.82 with Bulgaria, 32.73 with PGA Commission, 36.36 with Turkey	No
Ukraine	ICPDR, IDBC, Agreement between the Government of the Republic of Moldova and the Government of Ukraine on the Joint Use and Protection of Cross-Border Waters, Agreement between the Government of Ukraine and the Government of the Russian Federation on Joint Transboundary Waterbodies Management and Protection, Polish-Ukrainian TWC	94.54 with ICPDR, 47.27 with IDBC,65.45 with Moldova, 10.91 with Russia, 52.73 with Polish-Ukrainian TWC	Yes with Russia

Russian Federation	JCW, Joint Russian- Kazakhstan Commission for Utilization and Protection of Transboundary Waters(JCUPT) , Agreement between the Government of Ukraine and the Government of the Russian Federation on Joint Transboundary Waterbodies Management and Protection, Estonian-Russian Joint Commission on the Protection and Sustainable Use of Transboundary Waters, Amur River Basin Coordination Committee(ARBCC), CPRTW**	100.00 with JCW, 65.45 with JCUPT, 10.91 with Ukraine, 56.36 with Estonia, NA with ARBCC, 14.55 with CPRTW, NA and Latvia, 0.00 with Georgia	Yes with Georgia and Ukraine
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NA- Data Not Available

Notes:

\* The Polish-Slovak Transboundary Waters Commission: There is no information available on their functioning after October 2012.

\*\* The Joint Russian-Belarusian Commission for Protection and Rational Use of Trans boundary Water Bodies: The information available is not complete. Hence the WCQ is low.

++ Russia and Latvia: There are bilateral arrangements between the two nations. However, reliable information on the same is currently unavailable.

# Kura/Araks basin is shared between Armenia, Azerbaijan, Iran, Georgia and Turkey. There is no basin wide agreement or RBO/RBC for this basin. There are some bilateral arrangements between most of the riparians of the basin; but there is no further information available on them to calculate its WCQ. However, in the case of Armenia and Azerbaijan there is no bilateral cooperation with regards to the basin. Hence their WCQ is zero.



## NORTH AMERICA



- Water Cooperation Quotient between 0 and 18.18
- Water Cooperation Quotient between 18.19 and 100
- Water Cooperation Quotient between 0 and 18.18 with one or more neighbours and between 18.19 and 100 with others
- Risk of war with at least one neighbouring country
- No data or No shared surface water

## NORTH AMERICA

COUNTRY	COOPERATION DETAILS	WATER COOPERATION QUOTIENT	WAR,RISK OF WAR
Canada	International Joint Commission(IJC)	94.54	No
United States of America(USA)	IJC, International Boundary and Water Commission (IBWC) between US and Mexico	94.54 with IJC, 94.54 with IBWC	No
Mexico	IBWC, International Commission on Limits and Water between Mexico-Guatemala(CILA)	94.54 with IBWC, 52.72 with CILA	No
Guatemala	The Central American Integration System-Action Plan for Integrated Management of Water Resources, (SICA-PACADIRH), CILA, Trifinio Plan	100.00 with SICA-PACADIRH, 52.72 with CILA, 100.00 with Trifinio Plan	No
Belize	SICA-PACADIRH	100.00	No
Honduras	SICA-PACADIRH, Trifinio Plan	100.00 with SICA, 100.00 with Trifino	No
El Salvador	SICA-PACADIRH, Trifinio Plan	100.00 with CAIS, 100.00 with Trifino	No
Nicaragua	SICA-PACADIRH	100.00	No
Costa Rica	SICA-PACADIRH	100.00	No
Panama	SICA-PACADIRH	100.00	No
Haiti	Treaty of Peace and Friendship and Arbitration between Haiti and Dominican Rep.	67.27	No
Dominican Republic	Treaty of Peace and Friendship and Arbitration between Haiti and Dominican Rep.	67.27	No



## SOUTH AMERICA



- Water Cooperation Quotient between 0 and 18.18
- Water Cooperation Quotient between 18.19 and 100
- Water Cooperation Quotient between 0 and 18.18 with one or more neighbours and between 18.19 and 100 with others
- Risk of war with at least one neighbouring country
- No data or No shared surface water

## SOUTH AMERICA

COUNTRY	COOPERATION DETAILS	WATER COOPERATION QUOTIENT	WAR,RISK OF WAR
Colombia	Amazon Cooperation Treaty Organization(ACTO)	100.00	No
Venezuela	ACTO	100.00	No
Guyana	ACTO	100.00	No
Suriname	ACTO	100.00	No
Ecuador	ACTO	100.00	No
Peru	ACTO	100.00	No
Brazil	ACTO, Intergovernmental Coordinating Committee of the Countries of La Plata Basin (CIC)	100.00 with ACTO, 85.45 with CIC	No
Paraguay	CIC	85.45	No
Bolivia	ACTO, CIC	100.00 with Amazon, 85.45 with CIC	No
Argentina	CIC, Comisión Binacional de carácter permanente con el objeto de intensificar la cooperación económica y la integración física	85.45 with CIC, NA with Chile	No
Chile	Comisión Binacional de carácter permanente con el objeto de intensificar la cooperación económica y la integración física	NA with Argentina	No
Uruguay	CIC	85.45	No

NA-Data not available





- Water Cooperation Quotient between 0 and 18.18
- Water Cooperation Quotient between 18.19 and 100
- Water Cooperation Quotient between 0 and 18.18 with one or more neighbours and between 18.19 and 100 with others
- Risk of war with at least one neighbouring country
- No data or No shared surface water



## MIDDLE EAST

COUNTRY	COOPERATION DETAILS	WATER COOPERATION QUOTIENT	WAR,RISK OF WAR
Turkey	Joint Boundary Water Commission between Turkey and Georgia(JBWC), Joint Technical Committee between Iraq-Syria-Turkey on Euphrates Tigris(JTC ET Basin) Basin, Joint declaration of the Minister of Environment and Water of the Republic of Bulgaria and the Minister of Forestry and Water Affairs of the Republic of Turkey on cooperation in the field of water resources, Joint Declaration between the Minister for Environment, Energy and Climate Change of the Hellenic Republic and the Minister for Environment and Forestry of the Republic of Turkey	80 with JBWC, 1.81 with JTC ET Basin, 30.91 with Bulgaria, 36.36 with Greece	Yes with Iraq, Syria
Lebanon	Lebanese-Syrian Joint Committee for Shared Water(Orontes)	21.82 with Syria, 0.00 with Israel	Yes with Israel
Syrian Arab Republic (Syria)	Lebanese-Syrian Joint Committee for Shared Water(Orontes), Agreement Concerning the Utilization of the Yarmouk waters between Syria Arab Republic and Jordan, JTC ET Basin	21.82 with Lebanon and Jordan, 1.81 with JTC ET Basin, 0.00 with Israel	Yes with Israel, Turkey, Jordan
Israel	Joint Water Commission between Israel and Jordan( JWC Israel and Jordan), Joint Water Committee between Israel and Palestine	60 with Jordan, 10.91 with Palestine, 0.00 with Syria and Lebanon	Yes with Palestine, Lebanon, Syria
Jordan	JWC Israel and Jordan, Agreement Concerning the Utilization of the Yarmouk waters between Syria Arab Republic and Jordan	60 with Israel, 7.27 with Syria	Yes with Syria
Palestine	Joint Water Committee between Israel and Palestine	10.91 with Israel	Yes with Israel
Iran	HRDC, Agreement between the Government of Turkmenistan and the Government of Iran on Joint Exploration of Dostluk Water Reservoir, Treaty Concerning the State Frontier and Neighbourly Relations Between Iran and Iraq	58.18 with HRDC, 49.09 with Turkmenistan,1.81 with Iraq	No*
Iraq	JTC ET Basin, Treaty Concerning the State Frontier and Neighbourly Relations Between Iran and Iraq	1.81 with JTC ET Basin, 1.81 with Iran	Yes with Turkey

\*At present Iran and Iraq don't seem to have a risk of war. However, it is difficult to gauge whether in the near further such a risk would arise. Furthermore, there is inadequate information to gauge their water cooperation quotient.





- Water Cooperation Quotient between 0 and 18.18
- Water Cooperation Quotient between 18.19 and 100
- Water Cooperation Quotient between 0 and 18.18 with one or more neighbours and between 18.19 and 100 with others
- Risk of war with at least one neighbouring country
- No data or No shared surface water

## ASIA

COUNTRY	COOPERATION DETAILS	WATER COOPERATION QUOTIENT	WAR,RISK OF WAR
Afghanistan	Helmand River Delta Commission(HRDC)	58.18 with HRDC, 0.00 with Pakistan	Yes with Pakistan
Turkmenistan	Interstate Commission for Water Coordination of Central Asia (ICWC), Agreement between the Government of Turkmenistan and the Government of Iran on Joint Exploration of Dostluk Water Reservoir	38.18 with ICWC, 49.14 with Iran	No
Uzbekistan	ICWC	38.18 with ICWC	No
Kyrgyzstan	ICWC, Commission of the Republic of Kazakhstan and the Kyrgyz Republic on the Use of Water Management Facilities of Intergovernmental Status on the Rivers Chu and Talas (Chu and Talas Commission)	38.18 with ICWC, 61.81 with Chu and Talas Commission	No
Tajikistan	ICWC	38.18	No
Kazakhstan	ICWC, Chu and Talas Commission, Kazakhstan-China Joint Commission on Use and Protection of Transboundary Rivers(Kazakh-China Commission), JCUPT	38.18 with ICWC, 61.81 with Chu and Talas Commission, 43.63 with Kazakh-China Commission, 65.45 with JCUPT	No
Pakistan	Permanent Indus Commission(PIC)	5.45 with PIC, 0.00 with Afghanistan	Yes with India, Afghanistan
India	PIC, Bilateral cooperation between India-China on River Brahmaputra, Joint River Commission between India and Bangladesh(JRC), Bilateral cooperation between India- Bhutan, Mahakali River Commission between India and Nepal(MaRC), Bilateral cooperation between India-Myanmar	5.45 with PIC, 12.72 with China, 60 JRC, 67.27 with Bhutan, 56.36 with MaRc, 70.90 with Myanmar	Yes with Pakistan, China
Nepal	MaRC	56.36	No
Bangladesh	JRC	60 with JRC, NA with Myanmar	No
Bhutan	Bilateral cooperation between India and Bhutan	67.27	No
China	Bilateral cooperation between Myanmar and China; Kazakh-China Commission, Bilateral cooperation between India-China, Amur River Basin Coordination Committee(ARBC)	52.72 with Myanmar, 43.63 with Kazakh-China Commission, 12.72 with India, 0.00 with Vietnam, NA with ARBC	Yes with India, Vietnam



Mongolia (A)	ARBCC	NA with ARBCC	No
Myanmar	Bilateral cooperation between Myanmar and Bangladesh; Bilateral cooperation between India and Myanmar, Bilateral cooperation between Myanmar and China, ASEAN	NA with Bangladesh ,70.90 with India, 52.72 with China, 49.14 with ASEAN	No
Laos People's Democratic Republic(Laos)	Mekong River Commission(MRC), ASEAN	85.45 with MRC, 49.14 with ASEAN	No
Vietnam	MRC, ASEAN	85.45 with MRC, 49.14 with ASEAN, 0.00 with China	Yes with China
Thailand	MRC, ASEAN, Malaysia and Thailand Collaboration Project(MTCP)	85.45 with MRC, 49.14 with ASEAN,80 with MTCP	No
Cambodia (Kampuchea)	MRC, ASEAN	85.45 with Mekong, 49.14 with ASEAN	No
Malaysia	Johor River Water Agreement(JRWA), ASEAN, MTCP	81.81 with JRWA, 49.14 with ASEAN,80 with MTCP	No
Brunei	Bilateral cooperation between Brunei and Singapore, ASEAN	67.27 with Singapore, 49.14 with ASEAN	No
Singapore	JRWA, Bilateral cooperation between Brunei and Singapore, ASEAN	81.81 with JRWA, 67.27 with Brunei, 49.09 with ASEAN	No
Indonesia	ASEAN, Agreement between [Australia] (acting on its own behalf and on behalf of [Papua New Guinea]) and [Indonesia] concerning administrative border arrangements as to the border between Papua New Guinea and Indonesia(Bilateral-PNG and Indonesia)	49.09 with ASEAN, 29.09 with Papua New Guinea	No
Papua New Guinea	Bilateral-PNG and Indonesia	29.09 with Indonesia	No
Democratic Republic of Timor-Leste		NA with Indonesia	No
Democratic People's Republic of Korea(North Korea)		0.00 with South Korea	Yes with South Korea
Republic of Korea(South Korea)		0.00 with North Korea	Yes with North Korea

#### A-Anomaly

##### Note:

Mongolia comes across as an anomaly to the equation derived in the report as it has shared watercourses and no active water cooperation and does not have a risk of war. However it is to be noted that Mongolia is a part of the Greater Tumen Initiative (GTI), which is a body established to foster economic cooperation between riparian nations of the Tumen River. This body does however lay down a framework for water cooperation for the future as it addresses agriculture as well as some environmental initiatives. Furthermore, Mongolia is also a part of the Amur River Basin Coordination Committee (ARBCC) along with Russia and China. However there is no information available to determine its WCQ.

## AFRICA

COUNTRY	COOPERATION DETAILS	WATER COOPERATION QUOTIENT	WAR, RISK OF WAR
Tunisia	Sahara and Sahel Observatory-The North-Western Sahara Aquifer System (OSS-NWSAS)	56.36	No
Algeria	Lake Chad Basin Commission(LCBC) , Niger Basin Authority(NBA), OSS-NWSAS	43.63 with LCBC, 65.45 with NBA, 56.36 with OSS-NWAS, 0.00 with Morocco	Yes with Morocco
Morocco		0.00	Yes with Algeria
Mauritania	Organisation pour la Mise en Valeur du fleuve Sénégal (OMVS)	100.00	No
Mali	OMVS, NBA, Volta Basin Authority(VBA)	100.00 with OMVS, 65.45 with NBA, 83.63 with VBA	No
Libya	LCBC OSS-NWSAS	43.63 with LCBC, 56.36 with OSS-NWAS	No
Niger	LCBC, NBA	43.63 with LCBC, 65.45 with NBA	No
Egypt	Nile Basin Initiative(NBI), The 1959 Nile Waters Agreement between Sudan and Egypt for full control utilization of the Nile waters	27.27 with NBI, 96.36 with Sudan	No
Chad	LCBC, NBA	43.63 with LCBC, 65.45 with NBA	No
Sudan (A)	LCBC, NBI, The 1959 Nile Waters Agreement between the Sudan and Egypt for full control and utilization of the Nile waters	43.63 with Chad, 27.27 with NBI, 96.36 with Egypt	Yes with South Sudan
South Sudan (A)	NBI	27.27	Yes with Sudan
Eritrea		0.00	Yes with Ethiopia and Djibouti
Ethiopia	NBI	27.27 with NBI, 0.00 with Eritrea, Somalia	Yes with Eritrea and Somalia
Djibouti		0.00	Yes with Eritrea and Somalia





- Water Cooperation Quotient between 0 and 18.18
- Water Cooperation Quotient between 18.19 and 100
- Water Cooperation Quotient between 0 and 18.18 with one or more neighbours and between 18.19 and 100 with others
- Risk of war with at least one neighbouring country
- No data or No shared surface water

Somalia		0.00	Yes with Ethiopia
Senegal	OMVS, Gambia River Basin Development Organization (OMVG)	100.00 with OMVS, 54.54 with OMVG	No
Gambia	OMVG	54.54	No
Guinea	OMVS, NBA, OMVG	100.00 with OMVS, 65.45 with NBA, 54.54 with OMVG	No
Guinea-Bissau	OMVG	54.54 with OMVG	No
Central African Republic	LCBC, International Commission of Congo-Oubangui-Sangha (CICOS)	43.63 with LCBC, 41.81 with CICOS	No
Sierra Leone	(A)		No
Liberia	(A)		No
Cote D'Ivoire (Ivory Coast)	NBA, VBA	65.45 with NBA, 83.83 with VBA	No
Burkina Faso	NBA, VBA	65.45 with NBA, 83.63 with VBA	No
Ghana	VBA	83.63	No
Benin	NBA, VBA, Mono Basin Authority (MoBA)	65.45 with NBA, 83.63 with VBA, NA with MoBA	No
Togo	VBA, MoBA	83.63 with VBA, NA with MoBA	No
Nigeria	LCBC, NBA	56.36 with NBA, 43.63 with LCBC	No
Cameroon	LCBC, NBA, CICOS	43.63 with LCBC, 56.36 with NBA, 41.81 with CICOS	No
Equatorial Guinea		NA with Gabon	No
Gabon		NA with Equatorial Guinea	No
Republic of the Congo(Brazzaville)	CICOS	41.81	No
Democratic Republic of the Congo (DRC)	SADC, Zambezi Watercourse Commission(ZAMCOM), CICOS, Nile basin Initiative(NBI)	100.00 with SADC, 69.09 with ZAMCOM, 41.81 with CICOS, 27.27 with NBI	No
Uganda	Lake Victoria Basin Commission (LVBC), NBI	87.27 with LVBC, 27.27 with NBI	No
Kenya	LVBC, NBI	87.27 with LVBC, 27.27 with NBI	No
Burundi	LVBC, NBI	87.27 with LVBC, 27.27 with NBI	No
Rwanda	LVBC, NBI	87.27 with LVBC, 27.27 with NBI	No



United Republic of Tanzania	Southern African Development Community(SADC), LVBC, ZAMCOM, NBI	100.00 with SADC, 87.27 with LVBC, 69.09 with ZAMCOM, 27.27 with NBI	No
Malawi	SADC, Zambezi Watercourse Commission(ZAMCOM)	100.00 with SADC, 69.09 with ZAMCOM	No
Mauritius	SADC	100.00	No
Mozambique	SADC, ZAMCOM	100.00 with SADC, 69.09 with ZAMCOM	No
Angola	SADC, ZAMCOM, The Permanent Okavango River Basin Water Commission (OKACOM)	100.00 with SADC, 69.09 with ZAMCOM, 65.45 with OKACOM	No
Zambia	SADC, ZAMCOM	100.00 with SADC, 69.09 with ZAMCOM	No
Zimbabwe	SADC, ZAMCOM	100.00 with SADC, 69.09 with ZAMCOM	No
Namibia	SADC, ZAMCOM, OKACOM	100.00 with SADC, 69.09 with ZAMCOM, 65.45 with OKACOM	No
Botswana	SADC, ZAMCOM, OKACOM, Orange-Senqu River Commission (ORASECOM)	100.00 with SADC, 69.09 with ZAMCOM, 65.45 with OKACOM, 45.45 with ORASECOM	No
Swaziland	SADC	100.00	No
Lesotho	SADC, ORASECOM	100.00 with SADC, 45.45 with ORASECOM	No
South Africa	SADC, ORASECOM	100.00 with SADC, 45.45 with ORASECOM	No

NA - Data Not Available

A - Anomaly

#### Anomalies

1. Sierra Leone and Liberia grappled with a civil war which spilled into each other's territories making it at a risk of war. However, after the change in the government in the two countries and especially with the election of President Sirleaf in 2007, the relationship between the two nations stabilised. It is difficult to determine at this juncture whether this stability will remain in the future. Hence, the two countries present themselves as an anomaly as they are currently not at a risk of war but also do not engage in water cooperation. The two countries are members of the Mano River Union (MRU). MRU is essentially a regional integration organization with a focus on economic development. It was initially formed between Sierra Leone and Liberia in 1973. Though Guinea and Cote d'Ivoire joined in the course of time, the organization remained defunct for the longest period of its existence due to the internal instability of the member states. In 2008, it was decided to revive the MRU during the Heads of States summit. The organization however cannot be classified as a water cooperation mechanism, although there have been talks to turn it into one in



the coming ten years. At present the countries are grappling with Ebola, the organization is now being used for the purposes to elicit cooperation in this regard. There is however great potential for it to transform into active water cooperation.

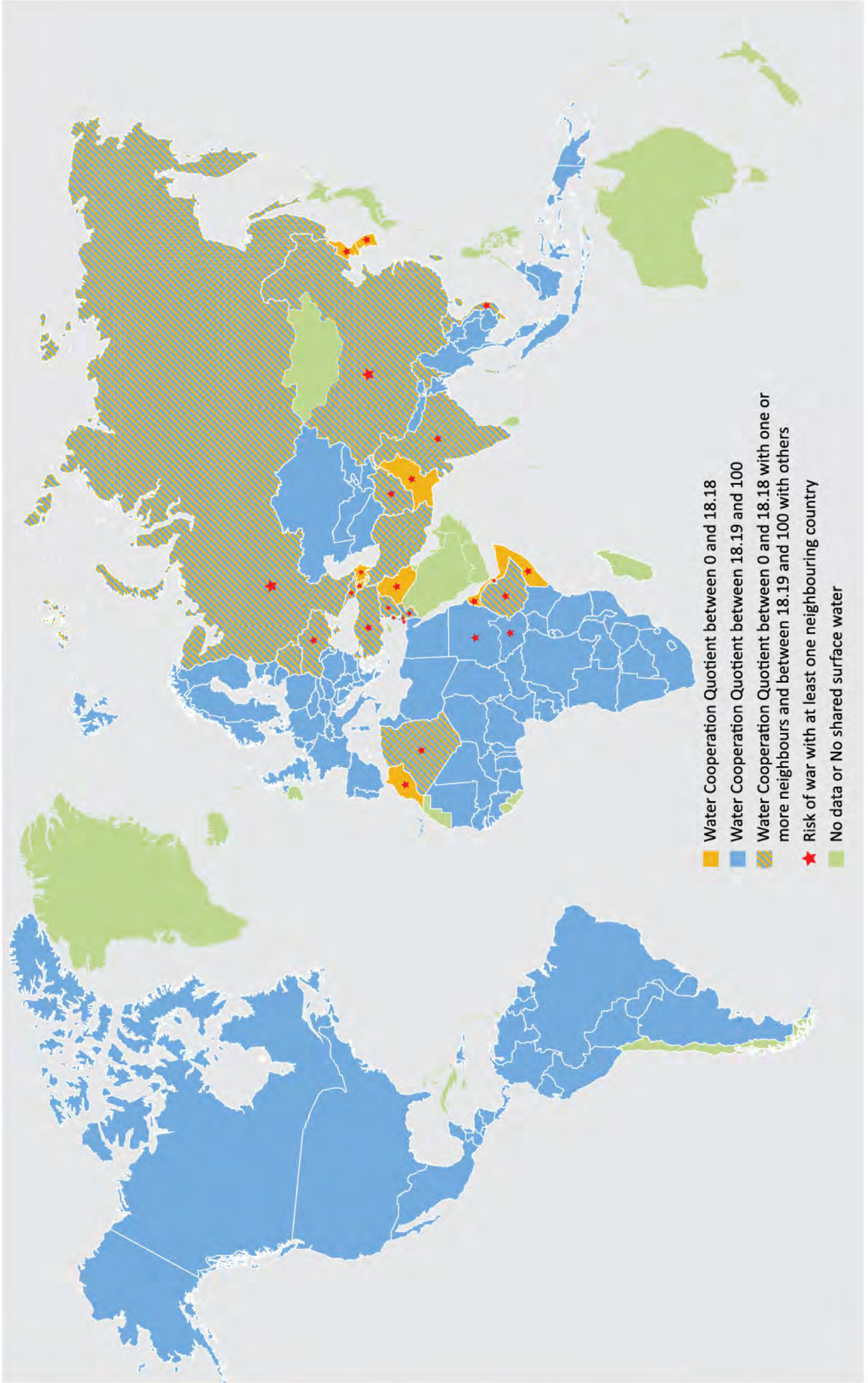
2. Sudan and South Sudan: The two countries are in a state of war, they have disputes over territories and they also support armed non state actors in each other's territories. It comes as an anomaly as they are a part of the Nile Basin Initiative (NBI) which has Active Water Cooperation albeit very low in score. It must however be noted that the war between Sudan and South Sudan is in effect an extension of the civil war in the erstwhile united Sudan. As the civil war lasted for about six decades after which South Sudan went on to become the world's youngest nation in 2011, the countries will require a few years to stabilize.

Notes:

- Morocco and Algeria: The two countries signed a memorandum of cooperation (MOC) in water resources on 18 March 2011. However, there is no indication that the countries were involved in any form of cooperation on water after 2011 or had in fact worked towards furthering their cooperation as detailed in the MOC.
- Rwanda and Democratic Republic of the Congo: Rwanda has until 2013 been accused of sponsoring rebel groups in DRC. However, the relationship between Rwanda and DRC has not been categorised as war or Risk of War in this report. Due to a highly unstable nature of the government in DRC, it is seen that Rwanda's intrusion is not objected by the government but by the international community. This situation does not strictly fall within the definition of War or the Risk of War in the report.



WORLD



## COUNTRIES WITH NO SHARED WATERCOURSES OR SURFACE WATERS

### AMERICAS

1. Bahamas
2. Cuba
3. Jamaica
4. Saint Kitts and Nevis
5. Antigua and Barbuda
6. Dominica
7. Saint Lucia
8. Barbados
9. Saint Vincent and the Grenadines
10. Grenada
11. Trinidad and Tobago

### EUROPE

12. Andorra
13. Iceland
14. Malta
15. Cyprus
16. Holy See
17. Ireland

### AFRICA

18. Cabo Verde
19. São Tomé and Príncipe
20. Mauritius
21. Comoros
22. Seychelles
23. Madagascar

### ASIA

24. Sri Lanka
25. Philippines
26. Japan
27. Maldives

### MIDDLE EAST

28. Saudi Arabia
29. Qatar
30. Bahrain
31. Kuwait
32. Yemen
33. Oman
34. United Arab Emirates (UAE)

### OCEANIA

35. Australia
36. New Zealand
37. Solomon Islands
38. Vanuatu
39. Kiribati
40. Marshall Islands
41. Nauru
42. Palau
43. Samoa
44. Tonga
45. Tuvalu
46. Federated States of Micronesia
47. Fiji



## WATER COOPERATION QUOTIENT RANKED

The table given below gives the calculated Water Cooperation Quotient (WCQ) of each cooperative arrangement and lists them in the descending order. The countries with cooperative mechanisms scoring below 18.18 are said to not be engaged in Active Water Cooperation and therefore at a Risk of War.

The Central American Integration System-Action Plan for Integrated Management of Water Resources (SICA-PACADIRH) (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama)	100
Trifinio Plan (El Salvador, Guatemala, Honduras)	100
Amazon Cooperation Treaty Organization (ACTO) (Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, Venezuela)	100
International Commission for the Protection of the Rhine (ICPR) (Switzerland, France, Germany, Netherlands, Luxembourg, Austria, Lichtenstein, Belgium, Italy)	100
Finnish- Russian Joint Commission on the Utilization of Frontier Waters (JWC) (Finland, Russia)	100
Latvia-Lithuania Cross-Border Cooperation Programme (BCP) (Latvia, Lithuania)	100
Organisation pour la Mise en Valeur du fleuve Sénégal (OMVS) (Senegal, Mauritania, Mali, Guinea)	100
South African Development Community (SADC) (Angola, Botswana, Democratic Republic of the Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia, Zimbabwe)	100
1959 Nile Waters Agreement (Egypt-Sudan)	96.36
International Joint Commission (IJC) (US-Canada)	94.54
International Boundary and Water Commission (IBWC) (US-Mexico)	94.54
European Union Water Framework Directive (EUWFD) (EU Community Members)	94.54
International Commission for the Protection of Lake Geneva - Rhone (CIPEL) (France-Switzerland)	94.54
International Commission for the Protection of the River Danube (ICPDR) (Germany, Austria, Czech Republic, Slovakia, Hungary, Slovenia, Croatia, Bosnia and Herzegovina, Serbia, Montenegro, Romania, Bulgaria, Moldova, Ukraine)	94.54
International Commission for the Protection of the Oder River against Pollution (ICPOAP) (Poland, Czech Republic, Germany)	94.54
Lake Victoria Basin Commission (LVBC) (Kenya, Tanzania, Uganda, Rwanda, Burundi)	87.27
Intergovernmental Coordinating Committee of the Countries of La Plata Basin (CIC) (Argentina, Bolivia, Brazil, Paraguay, Uruguay)	85.45
Mekong River Commission (MRC) (Cambodia, Laos, Thailand, Vietnam, China & Myanmar - dialogue partners)	85.45
Volta Basin Authority (VBA) (Burkina Faso, Ghana, Togo, Mali, Benin, Ivory Coast)	83.63
Johar River Water Agreement (JRWA) (Malaysia, Singapore)	81.81
Joint Boundary Water Commission (JBWC) (Turkey-Georgia)	80

Malaysia and Thailand Collaboration Project	80
Finnish-Norwegian Transboundary Water Commission	74.54
Finnish- Swedish Frontier River Commission (FRC)	74.54
Bilateral cooperation between India and Myanmar	70.90
Lake Ohrid Management Board (Albania, Macedonia)	70.90
Zambezi Watercourse Commission (ZAMCOM) (Angola, Zambia, Zimbabwe, Mozambique, Malawi, Tanzania, Botswana, Namibia, Democratic Republic of the Congo)	69.09
International Sava River Basin Commission (ISRBC) (Bosnia and Herzegovina, Croatia, Serbia, Slovenia)	69.09
Bilateral cooperation between India - Bhutan	67.27
Bilateral cooperation between Brunei & Singapore	67.27
Treaty of Peace, Friendship and Arbitration (Haiti- Dominican Republic)	67.27
Joint Russian- Kazakhstan Commission for Utilization and Protection of Transboundary Waters (JCUPT) (Russia, Kazakhstan)	65.45
Agreement between the Government of the Republic of Moldova and the Government of Ukraine on the Joint Use and Protection of the Cross-Border Waters (Moldova, Ukraine)	65.45
The Permanent Okavango River Basin Water Commission (OKACOM) (Angola, Botswana, Namibia)	65.45
Niger Basin Authority (NBA) (Benin, Chad, Burkina Faso, Cameroon, Ivory Coast, Guinea, Mali, Niger, Nigeria)	65.45
Commission of the Republic of Kazakhstan and the Kyrgyz Republic on the Use of Water Management Facilities of Intergovernmental Status on the Rivers Chu and Talas	61.81
Joint Water Commission between Israel and Jordan (JWC) (Israel and Jordan)	60
Joint River Commission (JRC) (India-Bangladesh)	60
Helmand River Delta Commission(HRDC) (Afghanistan, Iran)	58.18
Mahakali River Commission (MaRC) (India-Nepal)	56.36
The North-Western Sahara Aquifer System (NWSAS)/Administered by the Sahara and Sahel Observatory ("OSS") (Algeria, Tunisia, Libya)	56.36
Estonian-Russian Joint Commission on the Protection and Sustainable Use of Transboundary Waters (Russia, Estonia)	56.36



Gambia River Basin Development Organization (OMVG) (Gambia, Senegal, Guinea-Bissau)	54.55
The International Commission on Limits and Waters between Mexico and Guatemala (CILA)	52.73
Salween River Strategic Cooperation Framework Agreement (China-Myanmar)	52.73
The Polish-Ukrainian Transboundary Waters Commission (Poland, Ukraine)	52.73
Agreement between the Government of Turkmenistan and the Government of Iran on Joint Exploration of Dostluk Water Reservoir (Iran, Turkmenistan)	49.09
The Association of Southeast Asian Nations (ASEAN) (Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam, Brunei, Cambodia, Laos)	49.09
International Dnieper Basin Council (IDBC) (Belarus, Russia, Ukraine)	47.32
Drin Core Group (DCG) (Albania, Macedonia, Greece, Montenegro, Kosovo)	45.45
Orange-Senqu River Commission (ORASECOM) (Botswana, Lesotho, South Africa)	45.45
Kazakhstan – China Joint Commission on Use and Protection of Transboundary Rivers	43.03
Lake Chad Basin Commission (LCBC) (Cameroon, Central African Republic, Chad, Niger, Nigeria)	43.03
International Commission of Congo-Oubangui-Sangha (CICOS) (Cameroon, Central African Republic, Republic of the Congo)	41.81
Interstate Commission for Water Coordination of Central Asia (ICWC) (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan)	38.18
Joint Declaration between the Minister for Environment, Energy and Climate Change of the Hellenic Republic and the Minister for Environment and Forestry of the Republic of Turkey (Maritsa River) (Turkey, Greece)	36.36
The Polish-Slovak Transboundary Waters Commission (Poland, Slovakia)	34.55
The Permanent Greek-Albanian Commission on Transboundary Freshwater Issues (PGA Commission) (Greece Albania)	32.73
Joint declaration of the Minister of Environment and Water of the Republic of Bulgaria and the Minister of Forestry and Water Affairs of the Republic of Turkey on cooperation in the field of water resources. (Bulgaria, Turkey)	30.91
Agreement between [Australia] (acting on its own behalf and on behalf of [Papua New Guinea]) and [Indonesian] concerning administrative border arrangements as to the border between Papua New Guinea and Indonesia. (Papua New Guinea and Indonesia)	29.09
(Burundi, Rwanda, Kenya, Tanzania, Uganda, Democratic Republic of the Congo, Sudan, South Sudan, Ethiopia, Egypt, Eritrea - observer) Nile Basin Initiative (NBI)	27.27
Expert Working Group on Cooperation on Water and Environment (Greece, Bulgaria)	21.82
Lebanese-Syrian Joint Committee for Shared Water (Orontes) (Lebanon, Syria)	21.82

The Joint Russian-Belarusian Commission for Protection and Rational Use of Transboundary Water Bodies (CPRTW) (Russia, Belarus)	14-55
Bilateral cooperation on River Brahmaputra (India - China)	12-74
Joint Water Committee (Aquifers) (Israel, Palestine)	10-91
Agreement between the Government of Ukraine and the Government of the Russian Federation on joint transboundary waterbodies management and protection (Kiev, 19 October 1992) (Ukraine-Russia)	10-91
Agreement Concerning the Utilization of the Yarmouk waters between Syria Arab Republic and Jordan (Syria, Jordan)	7-27
Permanent Indus Commission(PIC) (India-Pakistan)	5-45
Joint Technical Committee between Iraq-Syria-Turkey on Euphrates Tigris Basin (JTC ET Basin) (Iraq, Turkey, Iran, Jordan, Syria)	1-81
Treaty Concerning the State Frontier and Neighbourly Relations Between Iran and Iraq (Iran, Iraq)	1-81
Trilateral cooperation between Jordan- Syria-Lebanon (Jordan)	0
Kura/Araks (Armenia, Azerbaijan)	0
Juba-Shibeli River Basin (Ethiopia, Somalia, Kenya)	0
Wadi Al Izziyah (Lebanon, Israel)	0
Terek (Russia, Georgia)	0
Kabul River (Pakistan, Afghanistan)	0
Han (South Korea, North Korea)	0
Awash (Ethiopia, Djibouti, Somalia)	0
Daoura/Dra/Guir/Oude bon naima/Tafna (Morocco, Algeria)	0
The Mareb River (Ethiopia, Eritrea)	0
Struma River Basin - Joint group between Greece and Bulgaria was created only in 2011	new
Mono River Basin	new
Mono Basin Authority (MoBa) was established only on the 4th of July 2014 (Togo, Benin)	new
Treaty on Cooperation in the Field of Protection and Sustainable Development of the Dniester River Basin, December 2012 (Ukraine, Moldova)	new



There is no reliable information available on the status of cooperation in the following basins. As a result, they had to be excluded from the evaluation process for the purpose of calculating the Water Cooperation Quotient.

1. Grijalva  
(Mexico, Guatemala, Belize)
2. Jurado  
(Colombia, Panama)
3. Cancosa/Lauca River Basin  
(Bolivia, Chile)
4. Comisión Binacional de carácter permanente con el objeto de intensificar la cooperación económica y la integración física  
(Argentina, Chile)
5. Veleka and Rezovska River Basins - Agreement Between the People's Republic of Bulgaria and the Republic of Turkey Concerning Co-operation in the Use of the Waters of Rivers Flowing Through the Territory of Both Countries
6. Zapadnaya Dvina/Daugava River Basin\*  
(Belarus, Latvia, Lithuania, Russia)
7. Vardar  
(Macedonia, Serbia, Montenegro, Greece)
8. Prohladnaja River  
(Poland, Russia)
9. Jakobselv River  
(Russia-Norway)
10. Glama River  
(Norway, Sweden)
11. Vistula/Wista  
(Poland, Ukraine, Belarus, Slovakia, Czech Republic)
12. Salaca River  
(Latvia-Estonia)
13. Parnu  
(Estonia, Latvia)
14. Marecchia, Ausa  
(Italy, San Marino)
15. Medjerda River Basin - Treaty of Fraternity and Concord between  
(Tunisia and Algeria)
16. Benito/Ntem  
(Cameroon, Equatorial Guinea, Gabon)
17. Mbe  
(Gabon, Equatorial Guinea)
18. Oueme  
(Benin, Nigeria, Togo)
19. Chiloango  
(Democratic Republic of the Congo, Angola, Republic of the Congo)
20. Atui  
(Mauritania, Western Sahara)
21. Nyanga  
(Gabon, Republic of the Congo)
22. Ogooue  
(Gabon, Republic of the Congo), Cameroon, Equatorial Guinea)
23. Lake Abhe Bad  
(Ethiopia, Djibouti)
24. Ili/Kunes He  
(Kazakhstan, China, Kyrgyzstan)
25. Harirud Dostluk Commission  
(Afghanistan, Iran, Turkmenistan)
26. Murgab River Basin  
(Afghanistan, Turkmenistan)
27. Samur  
(Russia, Azerbaijan)
28. Kura/Araks  
(Azerbaijan, Iran, Armenia, Georgia, Turkey)
29. Sulak  
(Russia, Georgia, Azerbaijan)
30. Astara Chay River Basin  
(Iran, Azerbaijan)



31. Pu Lun To  
(China, Mongolia, Russia, Kazakhstan)
32. Tarim  
(China, Kyrgyzstan, Tajikistan,  
Pakistan, Afghanistan)
33. Amur River Coordination  
Committee(ARBCC)  
(Russia, China, Mongolia)
34. Loes, Tono, and Noel Besi Rivers  
(East Timor,Indonesia)

Note:

\*In 2003, the provision for a Joint Russian-Byelorussian-Latvian Commission on the use and protection of water resources of the Zapadnaya Dvina/Daugava River Basin was included in a tri-lateral agreement between Russia, Belarus and Latvia. However, in 2009, Latvia declared the agreement invalid stating that neither Russia nor Belarus signed the agreement. There are bilateral agreements between these riparian nations on the governance of these river basins, but no reliable information is available regarding the same.



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# NOTES

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## NOTES

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