Allocations in Practice: What Happens in the Room

Aaron T Wolf, PhD
Program in Water Conflict Management
Oregon State University, USA
Visiting Scholar, IHE-Delft Institute for Water Education

Water Allocations in Transboundary Basins
Palais Des Nations
Geneva, Switzerland
16-17 October 2017

EMAIL: WOLFA@GEO.ORST.EDU
WWW.TRANSBOUNDARYWATERS.ORST.EDU
Scale of Conflict

- Cooperation
- Neutral Relations
- Disputes
- Hostilities (e.g. sanctions)
- Acute (Violent) Conflict
- War
- Security/Economic Alliance
- Tensions
<table>
<thead>
<tr>
<th>DATE</th>
<th>BASIN</th>
<th>COUNTRIES</th>
<th>BAR SCALE</th>
<th>EVENT SUMMARY</th>
<th>ISSUE TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/5/73</td>
<td>La Plata</td>
<td>Argentina--Paraguay</td>
<td>4</td>
<td>PRY AND ARG AGREE TO BUILD 1B DAM, HYDROELECTRIC PROJECT</td>
<td>Infrastructure</td>
</tr>
<tr>
<td>1/1/76</td>
<td>Ganges</td>
<td>Bangladesh--India--United Nations</td>
<td>-2</td>
<td>Bangladesh lodges a formal protest against India with the United Nations, which adopts a consensus statement encouraging the parties to meet urgently, at the level of minister, to arrive at a settlement.</td>
<td>Quantity</td>
</tr>
<tr>
<td>7/3/78</td>
<td>Amazon</td>
<td>Bolivia--Brazil--Colombia--Ecuador--Guyana--Peru--Suriname--Venezuela</td>
<td>6</td>
<td>Treaty for Amazonian Cooperation</td>
<td>Economic Development</td>
</tr>
<tr>
<td>4/7/95</td>
<td>Jordan</td>
<td>Israel--Jordan</td>
<td>4</td>
<td>Pipeline from Israel storage at Beit Zera to Abdullah Canal (East Ghor Canal) begins delivering water stipulated in Treaty (20 MCM summer, 10 MCM winter). The 10 mcm replaces the 10 mcm of desalinated water stipulated Annex II, Article 2d until desalinization plant completed</td>
<td>Quantity</td>
</tr>
<tr>
<td>6/1/99</td>
<td>Senegal</td>
<td>Mali--Mauritania</td>
<td>-3</td>
<td>13 people died in communal clashes in 6/99 along border between Maur. &amp; Mali; conflict started when herdsman in Missira-Samoura village in w. Mali, refused to allow Maur. horseman to use watering hole; horseman returned w/ some of his clansmen, attacking village on 6/20/99, causing 2 deaths; in retaliation that followed, 11 more died.</td>
<td>Quantity</td>
</tr>
</tbody>
</table>
RESILIENT TRANSBOUNDARY WATER INSTITUTIONS

• Adaptable Management Structure
  -- public input
  -- changing basin priorities
  -- new information/monitoring abilities

• Clear and Flexible Allocations
  -- rights to needs to interests
  -- hydrologic extremes
  -- new knowledge
  -- changing societal values

• Equitable Distribution of (Baskets of) Benefits, Not Water

• Detailed Conflict Resolution Mechanism

• Sustainable Institution and Financing
### Table 3: Treaty Statistics Summary Sheet

<table>
<thead>
<tr>
<th>Signatories</th>
<th>Information Sharing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bilateral 124/145 (86%)</td>
<td>Yes 93/145 (64%)</td>
</tr>
<tr>
<td>Multilateral 21/145 (14%)</td>
<td>No/N. A. 52/145 (36%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Principal Focus</th>
<th>Water Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Supply 53/145 (37%)</td>
<td>Equal Portions 15/145 (10%)</td>
</tr>
<tr>
<td>Hydropower 57/145 (39%)</td>
<td>Complex/Clear 39/145 (27%)</td>
</tr>
<tr>
<td>Flood Control 13/145 (9%)</td>
<td>Unclear 14/145 (10%)</td>
</tr>
<tr>
<td>Industrial Uses 9/145 (6%)</td>
<td>None/N. A. 77/145 (53%)</td>
</tr>
<tr>
<td>Navigation 6/145 (4%)</td>
<td></td>
</tr>
<tr>
<td>Pollution 6/145 (4%)</td>
<td></td>
</tr>
<tr>
<td>Fishing 1/145 (&lt;1%)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Monitoring</th>
<th>Non-Water Linkages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provided 78/145 (54%)</td>
<td>Money 44/145 (30%)</td>
</tr>
<tr>
<td>No/N. A. 67/145 (46%)</td>
<td>Land 6/145 (4%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Conflict Resolution</th>
<th>Political 2/145 (1%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Council 43/145 (30%)</td>
<td>Other Linkages 10/145 (7%)</td>
</tr>
<tr>
<td>Governmental Unit 9/145 (6%)</td>
<td>No Linkages 83/145 (57%)</td>
</tr>
<tr>
<td>UN/Third Party 14/145 (10%)</td>
<td></td>
</tr>
<tr>
<td>None/N. A. 79/145 (54%)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Enforcement</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Council 26/145 (18%)</td>
<td></td>
</tr>
<tr>
<td>Force 2/145 (1%)</td>
<td></td>
</tr>
<tr>
<td>Economic 1/145 (&lt;1%)</td>
<td></td>
</tr>
<tr>
<td>None/N. A. 116/145 (80%)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unequal Power Relationship</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes 52/145 (36%)</td>
<td></td>
</tr>
<tr>
<td>No/Unclear 93/145 (64%)</td>
<td></td>
</tr>
</tbody>
</table>
CURRENT LAW: MOST BASIC RULES

REFLECTED IN 1997 UN CONVENTION:

**Article 5: Equitable and reasonable utilization and participation**
Watercourse States shall in their respective territories utilize an international watercourse in an equitable and reasonable manner.

**Article 7: Obligation not to cause significant harm**
Watercourse States shall, in utilizing an international watercourse in their territories, take all appropriate measures to prevent the causing of significant harm to other watercourse States.

**Article 10: Relationship between different kinds of uses**
In the absence of agreement or custom to the contrary, no use of an international watercourse enjoys inherent priority over other uses.
In the event of a conflict between uses of an international watercourse, it shall be resolved with reference to the principles and factors set out in articles 5 to 7, with special regard being given to the requirements of vital human needs.
"International Watercourse" -- a watercourse, parts of which are situated in different States;

"Watercourse" -- a system of surface and underground waters constituting by virtue of their physical relationship a unitary whole and flowing into a common terminus.

**Article 6: Factors relevant to equitable and reasonable utilization:**

a) geographic, hydrographic, hydrological, climactic, ecological and other factors of a natural character;

b) social and economic needs of the States;

c) population dependent on the watercourse in each State;

d) effects of the use of the watercourse in one State on other States;

e) existing and potential uses of the watercourse;

f) conservation, protection, development and economy of use of the water resources and the costs of measures taken to the effect;

g) availability of alternatives, of corresponding value, to a particular or planned or existing use.
Precedence of International Law
(per Cano 1989)

1. Treaties and Conventions ratified by governments;
2. Customs;
3. Generally accepted principles;
4. Decision of the judiciary and doctrines of qualified authors.

- Customary law comes from practice, *not* the other way around
The Transboundary Freshwater Dispute Database

A Project of Oregon State University
Department of Geosciences and the Northwest Alliance for Computational Science

- Reference to 3,600 water-related treaties (805-1997)
- Full-text of 500 treaties and 40 US compacts, entered in computer database
- Detailed negotiating notes (primary or secondary) from fourteen case-studies of water conflict resolution
- Annotated bibliography of “State of the Art” of water dispute resolution literature
- News files on cases of acute water-related disputes
- Indigenous methods of water dispute resolution

GLOBAL DISTRIBUTION OF TREATY AND RBO COVERAGE
COMBINED TREATY/RBO SCORE

© OSU Transboundary Freshwater Dispute Database, 2009
Jim Duncan, Cartographer/Analyst
Projection - Mollweide
<table>
<thead>
<tr>
<th>#</th>
<th>Method of allocation</th>
<th>%</th>
<th>#</th>
<th>Reasoning</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Fixed quantities</td>
<td>27</td>
<td>23</td>
<td>No mention</td>
<td>32</td>
</tr>
<tr>
<td>15</td>
<td>Percentage</td>
<td>21</td>
<td>13</td>
<td>Irrigation only</td>
<td>18</td>
</tr>
<tr>
<td>8</td>
<td>Consultation or prior approval</td>
<td>11</td>
<td>11</td>
<td>Irrigation plus</td>
<td>15</td>
</tr>
<tr>
<td>6</td>
<td>Allocation of entire river</td>
<td>8</td>
<td>11</td>
<td>Hydropower production</td>
<td>15</td>
</tr>
<tr>
<td>5</td>
<td>Fixed quantities and percentages</td>
<td>7</td>
<td>9</td>
<td>Domestic plus</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>Percentage and consultation</td>
<td>7</td>
<td>5</td>
<td>Domestic only</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>Fixed quantities -vary according to availability</td>
<td>5</td>
<td>3</td>
<td>Benefits sharing</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Fixed quantities recouped in following period</td>
<td>4</td>
<td>3</td>
<td>Environmental protection</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Supply to specific groups</td>
<td>3</td>
<td>3</td>
<td>Flood control</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Mix of several methods</td>
<td>3</td>
<td>3</td>
<td>Industry</td>
<td>4</td>
</tr>
<tr>
<td>1</td>
<td>Based on time periods</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Diversions equal return flows</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Prioritization of uses</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1- Analysis of treaties within TFDD that allocate shared waters, the method of allocation and the reasoning given for allocation
In the room: where engineering and law collide
e.g. Allocations on the Incomati (1992)

South Africa and Swaziland agree to share water in terms of assurances using a unique formula, giving each state a certain amount (South Africa 157.8 CHM, Swaziland 15.1 CHM) at high assurance--2% risk in any one year of only partial availability--and another amount (South Africa 381 CHM, Swaziland 260.2 CHM) at low assurance -- total unavailability for up to 20% of the time on average in respect of 30% and a 2% risk in any one year of only partial availability in respect of the remaining 70%. Losses to evaporation are counted. In variable years, the ratio of the flows remains the same. A country may convert its allocations from low assurance to high assurance flow, or vice versa, at a conversion rate of 0.794, subject to approval.
In the room: where engineering and law collide eg. Johnston Negotiations 1954-56

Table 2: Water allocations from the Johnston Negotiations, in MCM/year.

<table>
<thead>
<tr>
<th>Plan</th>
<th>Israel</th>
<th>Jordan</th>
<th>Lebanon</th>
<th>Syria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main</td>
<td>393</td>
<td>774</td>
<td>-</td>
<td>45</td>
</tr>
<tr>
<td>Cotton (Israel)</td>
<td>1290</td>
<td>575</td>
<td>450</td>
<td>30</td>
</tr>
<tr>
<td>Arab</td>
<td>182</td>
<td>698</td>
<td>35</td>
<td>132</td>
</tr>
<tr>
<td>Unified</td>
<td>400*</td>
<td>720</td>
<td>35</td>
<td>132</td>
</tr>
</tbody>
</table>
## Four Worlds Framework: Four Needs and Four Claims

<table>
<thead>
<tr>
<th>Physical</th>
<th>Positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional</td>
<td>Interests</td>
</tr>
<tr>
<td>Perceptual</td>
<td>Values</td>
</tr>
<tr>
<td>Spiritual</td>
<td>Harmony</td>
</tr>
</tbody>
</table>

**NEEDS FOR:**
- Intrapersonal
- Interpersonal
- Groups
- Nations

**CLAIMS:**
Expressions of needs in negotiations
Self-actualization

Esteem

Love/Belonging

Safety

Physiological

morality, creativity, spontaneity, problem solving, lack of prejudice, acceptance of facts

self-esteem, confidence, achievement, respect of others, respect by others

friendship, family, sexual intimacy

security of body, of employment, of resources, of morality, of the family, of health, of property

breathing, food, water, sex, sleep, homeostasis, excretion
Basic Human Needs

Physiological Needs (survival)
- Air, Shelter, Water, Food

Safety and Security

Social Needs
- Friends, Family

Esteem
- Self-esteem, Confidence, Achievement

Self-actualization
- Creativity, Problem solving, Authenticity, Spontaneity

WiFi
Issue: Water Allocations in 1992 Peace Process

Positions: Israel – water allocations, Palestinians & Jordanians – water rights

Interests:

Values:

Solution:
**Issue:** Water Allocations in 1992 Peace Process

**Positions:** Israel – water allocations, Palestinians & Jordanians – water rights

**Interests:** Israel wants to problem-solve, Palestine wants history recognized

**Values:** Respect, sovereignty

**Solution:** ???
**Issue:** Water Allocations in 1992 Peace Process

**Positions:** Israel – water allocations, Palestinians & Jordanians – water rights

**Interests:** Israel wants to problem-solve, Palestine wants history recognized

**Values:** Respect, sovereignty

**Solution:** “Rightful Allocations”
Criteria Invoked for Water Transformation

Initial Positions:
- Rights-based: Geography vs. Chronology

Interim Positions:
- Needs-based plus recognition of historic use

Agreement:
- Interest-based: Identification and assessment of “baskets” of benefits (perhaps beyond water)

Implementation:
- Equitable distribution of benefits
I. Overview: Basins with Boundaries

Common Criteria: “Rights”

Key Concepts:
Intro to Hydropolitics
Intro to Negotiations

Exercises: Trust-building
Assessing a basin:
Identifying parties, issues, interests
GAP analysis
Planning by nation
Options for Fixed Allocations

1. Downstream quantity is fixed
   - eg. Colorado

2. Upstream quantity is fixed
   - eg. Jordan

3. Variable allocations, based on precipitation
   - eg. Ganges
II. Changing Perceptions: Basins Without Boundaries

Common Criteria: “Needs”

Key Concepts:
- Cooperative Framework
- Lessons Learned
- The New Diplomacy

Exercises: Skills-building
- Interpersonal skills, eg.
- Active listening
- Thinking as a basin:
  - Planning by sectors
<table>
<thead>
<tr>
<th>Treaty</th>
<th>Criteria for Allocations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt/Sudan (1929, 1959, Nile)</td>
<td>&quot;Acquired&quot; rights from existing uses, plus even division of any additional water resulting from development projects</td>
</tr>
<tr>
<td>Johnston Accord (1956, Jordan)</td>
<td>Amount of irrigable land within the watershed in each State</td>
</tr>
<tr>
<td>India/Pakistan (1960, Indus)</td>
<td>Historic and planned use (for Pakistan) plus geographic allocations (western vs. eastern rivers)</td>
</tr>
<tr>
<td>South Africa (Southwest Africa)/Portugal (Angola) (1969, Kunene)</td>
<td>Allocations for human and animal needs, and initial irrigation</td>
</tr>
</tbody>
</table>
Graph 3- Of water allocations that define allocations by fixed quantities (31), an analysis of how needs are defined in each treaty by percentage.
More recently:
- Instream flows & environmental services
- Spiritual values; eg. water for religious dips, rivers with human rights

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1) domestic</td>
<td>1) domestic and sanitary</td>
<td>1) domestic</td>
<td>1) domestic and urban uses</td>
<td></td>
</tr>
<tr>
<td>2) agriculture</td>
<td>2) navigation</td>
<td>2) non-consumptive</td>
<td>2) other criteria from Helsinki Rules w/out priority</td>
<td></td>
</tr>
<tr>
<td>3) electric power</td>
<td>3) power and irrigation</td>
<td>3) agriculture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) other industry</td>
<td></td>
<td>4) hydro-power</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5) navigation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6) fishing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7) other beneficial uses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Four Worlds Framework: Four Needs and Four Claims

**NEEDS FOR:**
- Intraperpersonal
- Interpersonal
- Groups
- Nations

<table>
<thead>
<tr>
<th>Physical</th>
<th>Positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional</td>
<td>Interests</td>
</tr>
<tr>
<td>Perceptual</td>
<td>Values</td>
</tr>
<tr>
<td>Spiritual</td>
<td>Harmony</td>
</tr>
</tbody>
</table>

**CLAIMS:** Expressions of needs in negotiations
Allocating Scarce Resources
Allocating Scarce Resources

- Personal & Spiritual Needs
Allocating Scarce Resources

- Personal & Spiritual Needs
- Subsistence Agriculture
- Subsistence Industry
Allocating Scarce Resources

- Personal & Spiritual Needs
- Subsistence Agriculture
- Subsistence Industry
- Critical Ecosystems
Allocating Scarce Resources

- Personal & Spiritual Needs
- Subsistence Agriculture
- Subsistence Industry
- Critical Ecosystems
- Industrial Agriculture
- Commercial Industry
III: Enhancing and Sharing Benefits

**Common Criteria:**
“Benefits”

**Key Concepts:**
Economics of Int’l waters
Equity, Efficiency, and Thinking Beyond the River

**Exercises: Consensus-building**
Enhancing benefits
Types of Cooperation – a Cooperation Continuum

- Communication and notification
- Information sharing
- Regional assessments

- Identify, negotiate and implement suites of national investments that capture incremental cooperative gains
- Adapt national plans to mitigate regional costs
- Adapt national plans to capture regional gains

- Joint project assessment and design
- Joint ownership
- Joint institutions
- Joint investment

Types of Cooperation – a Cooperation Continuum

- Unilateral Action
- Coordination
- Collaboration
- Joint Action

- Type 1 benefits
- Type 2 benefits
- Type 3 benefits
- Type 4 benefits

Types of Cooperation – some examples

- **Indus**: communication
  - 1-3
  - cost sharing

- **Jordan**: info sharing, assessments
  - 1-4
  - cost sharing

- **Rhine**: convergent national agendas
  - 1,3
  - cost sharing

- **Orange**: joint prep and investment
  - 2,3
  - purchase agreement, financing

- **Senegal**: joint equity ownership
  - 1-4
  - joint ownership

- **River**: type of cooperation
  - type of benefit
  - type of benefit sharing

**Cooperation Continuum**

**Dispute**
- Unilateral Action
- Coordination
- Collaboration
- Joint Action

**Integration**

Three Aspects of Allocations:

“All” that needs to be decided on at the border

1. Quantity
2. Quality
3. Timing
Columbia River Basin

Legend
- Indian Reservation

The Lower Columbia River is the reach from Bonneville Dam downstream to the Ocean.

The Middle Columbia River is the reach from Grand Coulee Dam to Bonneville Dam.

The Upper Columbia River is the reach upstream of Grand Coulee Dam.
Negotiated Basin Development Space
Environmental Sensitivity Rankings
(Reflecting Interest and Values)
IV. Putting it all Together: Institutional Capacity

**Common Criteria:**
“Equity”

**Key Concepts:**
Int’l Water Law

Institutions in Practice, Track II, Stakeholder Participation

**Exercises: Re-entry**
Crafting Institutions

“Forgotten” and Unforeseen Issues
Sharing benefits: possible mechanisms

- Water sharing
  - (Re)assigning rights
- Payments for water
  - Payment for use rights, bilateral sale or water markets
- Payments for benefits
  - Compensation for lost benefits, payments to allow new uses
- Purchase agreements – power, agriculture, etc.
  - Agreed price can effect a transfer of benefits
- Financing & ownership arrangements
  - Agreed terms can effect a transfer of benefits
- Bundling broader benefits
  - Trade, transport….

New Directions: Spiritual Aspect of Water
NEW ZEALAND NATIONAL POLICY STATEMENT for Freshwater Management 2014

- “Addressing tāngata whenua values and interests across all of the well-beings, and including the involvement of iwi and hapū in the overall management of fresh water, are key to meeting obligations under the Treaty of Waitangi (1840).”

- All things in the natural world have mauri (life force) and wairua (a spiritual dimension). Respect for the spiritual integrity of the environment and the atua (God) that created it will ensure that the taonga (treasure) can be protected and passed on to succeeding generations.
New Directions: Spiritual Aspect of Water

- River has legal personhood in NZ; settlement gives standing
  - 2 guardians -- one from the trust and one from the crown
- 2 rivers in India also received personhood, but no guardians
- Implications for allocations?
Lessons from In the Room

- Customary law comes from practice, *not* the other way around
  - Can’t use customary law to determine allocations, but rather can determine boundary conditions for dialogue
  - "(T)he principles (of customary law) themselves derive from the process and the outcomes of the process rather than prescribe either the process or its outcome" Dellapenna 1997
- Legal principles offer umbrella for negotiations; negotiations determine solutions
- If the parties agree, it’s reasonable and equitable
- Resilient agreements allow for evolving values & conflict mitigation
- Problem is not lack of guidelines or principles (or, really, lack of water), but lack of process. *This is where international community can make its best contribution*
Thank you!