Benefit Sharing on International Rivers: principles and lessons from experience

David Grey (Oxford University)
“But the water problems of our world need not be only a cause of tension; they can also be a catalyst for cooperation. If we work together, a secure & sustainable water future can be ours.”   Kofi Annan Feb 2002

catalyst for cooperation: cost & benefit sharing in many basins....

Map from A. Wolf
But... hydrological complexity & curse of variability

- Extreme variability must be mitigated to reduce risks to society
- Tradeoffs will be significant: assess, share & manage costs

Countries with simple hydrologies and high investments in water security have high incomes

<table>
<thead>
<tr>
<th>Basins: population &gt; 2m</th>
<th>Colors: GDP per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal axis: hydrological complexity</td>
<td></td>
</tr>
<tr>
<td>Vertical axis: investment in water security</td>
<td></td>
</tr>
</tbody>
</table>
Benefit-Sharing Mechanisms:
- Gross benefits divided equally 50/50
- Payment to Canada of $65m for flood storage
- Canada 50% of extra power generated by US hydro
- Canada sold first 30 year ‘entitlement’ for $250m
- 3 Treaty Dams in Canada financed
- BC will receive $5-9bn in future
- 1995 Columbia Basin Trust for community projects

Cost & benefit sharing: flood & hydro: 1961 Canada/USA Columbia River Treaty

“Goal would be to achieve an agreement in which the fortunes of the basin countries will rise and fall together, without there being a relative shift in the distribution of costs and benefits that can cause dissatisfaction and irritation”

–David LeMarquand (1977)
Lesotho – South Africa cost & benefit sharing
Lesotho Highlands Water Commission & Project
largest international inter-basin transfer in the world

Project/Program

• A series of dams and tunnels to divert water leaving Lesotho north to Gauteng
• RSA responsible for all costs to LHWP (including social & environ measures)
• Lesotho responsible for hydropower

Benefit-Sharing Mechanism

• Cost savings in undertaking LHWP shared 56% for Lesotho, 44% for RSA
• $360 million to Lesotho and $280 million to RSA
• Royalties to Lesotho
• Community development fund

Treaties/Agreements: Lesotho Highlands Water Project Treaty (1986)
Primary infrastructure: Katse (1998), Mohale (2002), Mashai, Tsoelike, Noahae, Malatsi
Institutions: Lesotho Water Commission, LHDA
**Senegal River: cost & benefit sharing:**

Financing Mananthali dam: jointly-owned by Mali, Mauritania & Senegal

**Diagram:***

- **SOGEM (Asset Holder)**
- **MANATLALI DAM & Other ASSETS**
- **CONTRACTOR(S)**
- **Subsidiary Loan**
- **Debt Service**
- **Net Revenues**
- **Transfer of O&M Rights**
- **OMVS (River Basin Organisation)**
- **Funding**
- **Debt Service**
- **IDA/AFDB/EIB**

**Table:***

<table>
<thead>
<tr>
<th>Country</th>
<th>Irrigation</th>
<th>Energy</th>
<th>Navigation</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mali</td>
<td>11%</td>
<td>52%</td>
<td>82%</td>
<td>35.3%</td>
</tr>
<tr>
<td>Mauritania</td>
<td>31%</td>
<td>15%</td>
<td>12%</td>
<td>22.6%</td>
</tr>
<tr>
<td>Senegal</td>
<td>58%</td>
<td>33%</td>
<td>6%</td>
<td>42.1%</td>
</tr>
</tbody>
</table>

**Map:**

- Atlantic Ocean
- Senegal
- Guinea Bissau
- Guinea
- Mali
- Mauritania
- Others

**Photo:**

- Mananthali Dam
World Bank Approves Rusumo Falls Hydropower Plant

AfDB awards US$113 million grant for Rusumo Falls Hydropower Project

Upper Nile cost & benefit sharing: hydropower & interconnection
Itaipu Hydropower (Brazil – Paraguay): international & local benefit sharing

International project, local benefit sharing: the case of Brazil:
6.75% of revenues as royalties:
45% to states
45% to affected municipalities
10% to central regulator
    – 40% service supervision
    – 35% WRM
    – 25% environ. protection
Ganges: benefit sharing ‘beyond the river’ - unexploited opportunity?

- 1972 India-Bangladesh Joint Rivers Commission
- 54 border rivers/tribs
- 1996 Treaty: Ganges water sharing at Farakka barrage
  - March 11-May 10 guaranteed 35000 cusecs flow to each country in alternate 10 days
- ‘Beyond the river’ deals?
Ganges: potential benefit sharing? ..‘beyond the river’

Oil/gas pipelines

Road links

Railway links

Inland water transport

Port access
Why do countries cooperate?
- converging national agendas

..all cases can be rational - choice will depend upon *perceptions* & *calculus* of their relative benefits.
Perceptions are Important
**calculus**: look for 4 types of benefits

<table>
<thead>
<tr>
<th>Type 1: Environmental</th>
<th>Improved ecosystem sustainability, conservation &amp; water quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing Benefits</td>
<td><em>To the river</em></td>
</tr>
<tr>
<td><strong>Type 2: Economic</strong></td>
<td>Improved productivity, flood &amp; drought management</td>
</tr>
<tr>
<td>Increasing Benefits</td>
<td><em>From the river</em></td>
</tr>
<tr>
<td><strong>Type 3: Political</strong></td>
<td>Reduced risks; policy shift to cooperation &amp; development</td>
</tr>
<tr>
<td>Decreasing Costs</td>
<td><em>Because of the river</em></td>
</tr>
<tr>
<td><strong>Type 4: Indirect Economic</strong></td>
<td>Broader regional cooperation &amp; integration</td>
</tr>
</tbody>
</table>
What is cooperation?

- Cooperation is not “all or nothing”
  *more* cooperation is not necessarily *better*

- Different levels of cooperative effort
  different benefits, in different places, at different times

- “Right” level of effort depends on potential benefits
  driven by hydrology, economics, riparian relations

- .....and the costs of capturing those benefits

- A “continuum of cooperation”
**Cooperation Continuum: context specific**

- **Mekong**
  - info sharing, assessments

- **Rhine**
  - converging national agendas
  - Adapt national plans to mitigate regional costs
  - Adapt national plans to capture regional gains
  - Identify, negotiate & implement national investments that capture cooperative gains

- **Orange**
  - (Lesotho Highlands)
  - joint prep & investment

- **Senegal**
  - joint equity ownership
  - Joint institutions
  - Joint project assessment & design
  - Joint investment
  - Joint ownership of assets

- **Communication & notification**
- **Information sharing**
- **Regional assessments**

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

**Mekong** info sharing, assessments

**Rhine**
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## Sharing cooperation benefits: possible mechanisms

<table>
<thead>
<tr>
<th>Water Sharing</th>
<th>Benefit Sharing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assigning rights</td>
<td><strong>Direct payment for water use</strong> - e.g., municipal or irrigation supplies (rights already assigned)</td>
</tr>
<tr>
<td></td>
<td><strong>Direct payment for benefits</strong> - e.g., fisheries, watershed mgmt; or compensation for costs - <em>e.g., inundated land, pollution</em></td>
</tr>
<tr>
<td></td>
<td><strong>Purchase agreements</strong> - e.g., power, agriculture products (benefit transfer through terms/price)</td>
</tr>
<tr>
<td></td>
<td><strong>Financing &amp; ownership arrangements</strong> - e.g., power infrastructure (benefit transfer through deal structure)</td>
</tr>
<tr>
<td></td>
<td><strong>Broadened bundle of benefits</strong>, including provision of unrelated goods and services &amp; less tangible (e.g. reputational) benefits</td>
</tr>
</tbody>
</table>
Cost & benefit Sharing: take away messages

- Rivers can be obstacles or entry points to cooperation – both directly & beyond the river
- Riparians most likely to cooperate if they *perceive* benefits outweigh costs
- Share benefits, not just water (not zero sum): international; locally affected people → shareholders (eg power sales revenues); affected environment (eg set-asides & offsets)
- Increasing scope & scale of benefits & range of benefit sharing mechanisms motivates cooperation
- Ensuring fairness - sustains cooperation
- Cooperative basin-wide planning can identify “optimal” plans
- Physical distribution of benefits may be perceived as unfair
- Physical location of benefits (activity location) can be separate from their economic distribution (who profits from / pays for activities)
What might this mean for the Mekong? –

**clear mandate:** implementation, cooperation, mutual benefits, joint development

- **Definition of Terms: BDP:** general planning tool & process that JC would use as blueprint to identify, categorise & prioritise projects & programmes to seek assistance for & to *implement plan at basin level*

- **Article 1:** *to cooperate* in all fields of sustainable development, utilisation, management & conservation of water and related resources of Mekong....... *to optimise multiple-use & mutual benefits of all riparians*...

- **Article 2:** to promote, support, cooperate & coordinate in development of full potential of sustainable benefits to all riparian States....... with emphasis & preference on *joint &/or basin-wide development* through formulation of *basin development plan*, that would be used to identify, categorise & prioritise the projects & programmes to seek assistance for and to *implement at basin level*
Floods claim 207 lives, affect 1.2 million people in Cambodia

Published: October 10, 2011

PHNOM PENH (Xinhua) -- The Mekong River and flash floods had killed at least 207 people and affected about 1.2 million people in 19 inundated cities and provinces in Cambodia, Nhim Vanda, the first vice president of the National Committee for Disaster Management, said on Monday in a press briefing.

"Among the dead, 52 percent is children," he said.

More than 300,000 hectares of rice paddies have been affected and other 100,000 hectares of rice paddies were completely damaged.

Some 600 houses were swept away by floods and other 196,600 houses, 1,132 schools and 400 Buddhist pagodas are inundated, he said, adding that some 180 kilometers of national roads and around 1,800 kilometers of gravel roads have been affected.

Her agency puts the death toll at 269 in Thailand, 183 in Cambodia, 30 in Laos and 18 in Vietnam, including 16 children.
What might this mean for the Mekong?

from: positions → interests → possible ‘deals’

<table>
<thead>
<tr>
<th>Country</th>
<th>Position</th>
<th>Interest</th>
<th>Possible DEALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>unilateral hydropower?</td>
<td>power, reputation, trade?</td>
<td>YES to all?</td>
</tr>
<tr>
<td>Myanmar</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Laos</td>
<td>?</td>
<td>?</td>
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<tr>
<td>Cambodia</td>
<td>?</td>
<td>?</td>
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<tr>
<td>Vietnam</td>
<td>?</td>
<td>?</td>
<td>?</td>
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<tr>
<td>Thailand</td>
<td>?</td>
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</table>
Possible areas for deals?
examples of meeting interests, joint development, benefit sharing

<table>
<thead>
<tr>
<th>Project</th>
<th>Partners</th>
<th>Description</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mekong Ecosystem</td>
<td>All ?</td>
<td>EG Transboundary parks, iconic species, watershed protection,</td>
<td>HEP funding for watersheds; GPG (GEF?) for parks,</td>
</tr>
<tr>
<td>Low flows (Art.6)</td>
<td>?</td>
<td>EG Joint financing storage backed tributary HEP</td>
<td>Secure access to ‘insurance’ low flows for extreme events</td>
</tr>
<tr>
<td>Downstream floods</td>
<td>?</td>
<td>EG Floodplain storage &amp; easements</td>
<td>Flood risk reduction; irrigation</td>
</tr>
<tr>
<td>Power</td>
<td>?</td>
<td>EG Joint financing mainstream &amp; tributary hydro</td>
<td>Rapid development path Least risky hydro Increased revenues ‘Beyond the river’: trust, trade, etc</td>
</tr>
<tr>
<td>Navigation</td>
<td>?</td>
<td>EG Joint financing of locks, channel upgrades, etc</td>
<td>Trade, tourism, interconnection, port access, ‘beyond the river’</td>
</tr>
</tbody>
</table>
IPOE-led Workshop 28/03/04

• Country Groups:
  – Interests
  – Opportunities

• Groups:
  – 2040: the Mekong we want to avoid
  – 2040: the Mekong we want to see
  – 2018: some early joint opportunities (‘deals’), moving towards the Mekong we want to see
  – 2016: the MRC we need: to promote the ‘deals’ & achieve the Mekong we want to see
interests, risks, opportunities... possible areas

<table>
<thead>
<tr>
<th></th>
<th>2040</th>
<th>2040</th>
<th>2018</th>
<th>2016</th>
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<tbody>
<tr>
<td>Social-economic-status</td>
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<tr>
<td>Flooding</td>
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<tr>
<td>Low flows</td>
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<tr>
<td>Water quality</td>
<td></td>
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<tr>
<td>Environment, biodiversity</td>
<td></td>
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<tr>
<td>Reliable irrigated? food production &amp; trade</td>
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<tr>
<td>Fisheries &amp; trade</td>
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<tr>
<td>HEP peaking power &amp; interconnection</td>
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<td></td>
</tr>
<tr>
<td>Navigation</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Recreation/tourism</td>
<td></td>
<td></td>
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<tr>
<td>Other (cities?)?</td>
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</tbody>
</table>
### BDP Regional Working Group Workshop, Hanoi 28/03/14

“**The 2030 Mekong We Want: Early Steps Along the Way**”

<table>
<thead>
<tr>
<th>The Mekong we must avoid by 2030</th>
<th>The Mekong we want by 2030</th>
<th>Joint opportunities we could develop by 2018 → Mekong we want by 2030</th>
<th>MRCS actions by 2016 to promote the 2018 deals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conflict (regional &amp; local)</strong></td>
<td><strong>Strong regional cooperation</strong></td>
<td><strong>MRC processes</strong></td>
<td><strong>MRCS reform</strong></td>
</tr>
<tr>
<td>• Serious regional economic divide</td>
<td>• Regional security and peace</td>
<td>• MRC dialogue with regional initiatives (ASEAN, GMS) established</td>
<td>• ‘Real’ RBO, with effective architecture, including riparian CEO, integrated riparian staff with common goals, core river basin management functions &amp; strong riparian political &amp; financial support:</td>
</tr>
<tr>
<td>• Trans-boundary political disputes</td>
<td>• Strong commitment, trust, 1995 Agreement implemented</td>
<td>• MRC guidelines for 5 procedures finalized &amp; implemented, with cooperative mechanism for PNPCA implementation</td>
<td>• implementing 1995 Agreement &amp; MRC decisions</td>
</tr>
<tr>
<td>• Severe competition over water use</td>
<td>• Harmonised MRC, ASEAN, GMS</td>
<td>• Capacity to implement decentralised functions established</td>
<td>• undertaking M&amp;E &amp; sharing information</td>
</tr>
<tr>
<td>• Social conflicts: major income inequality, lost livelihoods, unemployment</td>
<td>• All middle-income countries, populations stabilised &amp; poverty ended</td>
<td>• Basin environmental objectives &amp; standards established</td>
<td>• updating &amp; implementing BDS</td>
</tr>
<tr>
<td><strong>Water insecurity</strong></td>
<td>• No outside political interference</td>
<td>• BDS routine updating, engaging China &amp; Myanmar</td>
<td>• facilitating riparian action, including joint project implementation</td>
</tr>
<tr>
<td>• Degraded watersheds, ecosystems &amp; deforestation</td>
<td>• ‘Green economies’</td>
<td>• MRCS promotion facility for joint investments established, including:</td>
<td>• involving multiple riparian line agencies</td>
</tr>
<tr>
<td>• Sedimentation/ river bank erosion</td>
<td>• Jointly financed, win-win development, with benefit sharing</td>
<td>• joint basin-level planning</td>
<td>• building ‘level’ riparian capacity</td>
</tr>
<tr>
<td>• Saline intrusion</td>
<td><strong>Water, energy &amp; food security</strong></td>
<td>• benefit-sharing mechanisms</td>
<td>• coordinating with ASEAN, GMS etc</td>
</tr>
<tr>
<td>• Poor water quality, pollution, biodiversity loss, loss of fisheries (‘dead’ river)</td>
<td><strong>MRC</strong></td>
<td><strong>Joint &amp;/or Basin-wide projects/programs</strong></td>
<td>• collaborating with national/regional universities</td>
</tr>
<tr>
<td>• Unmitigated droughts and floods</td>
<td>• Healthy ecosystems, good water quality</td>
<td>(Art.2, 1995): some ideas for ‘deals’</td>
<td>• coordinating external partner support (possible ‘basket’ trust fund)</td>
</tr>
<tr>
<td>• Uncontrolled water (over)abstraction</td>
<td>• Flood &amp; drought resilience</td>
<td>• Joint investments (government to government &amp; PPP) identified &amp; under preparation:</td>
<td><strong>MRCS Actions:</strong></td>
</tr>
<tr>
<td>• Inadequate water &amp; sanitation services</td>
<td>• Prosperous agriculture &amp; fisheries</td>
<td>• hydropower, interconnection, rural electrification</td>
<td>• Decentralization well underway</td>
</tr>
<tr>
<td>• Unmitigated climate change → maladaptation to water/climate variability and shocks</td>
<td>• Optimal water use</td>
<td>• food security (eg regional rice production centre)</td>
<td>• New style BDS completed &amp; adopted</td>
</tr>
<tr>
<td><strong>Associated socioeconomic conditions</strong></td>
<td>• Climate change adaptation</td>
<td>• Joint knowledge &amp; monitoring centre (eg flow, quality, environ. indicators)</td>
<td>• Cooperative Regional Assessment underway</td>
</tr>
<tr>
<td>• Energy and food insecurity</td>
<td>• Development/environment in balance</td>
<td></td>
<td>• Basket fund established</td>
</tr>
<tr>
<td>• Sustained poverty</td>
<td><strong>MRC</strong></td>
<td></td>
<td>• Pilot benefit-sharing projects prepared</td>
</tr>
<tr>
<td>• Loss of cultural heritage</td>
<td><strong>Strong policy/regulatory framework</strong></td>
<td><strong>Joint &amp;/or Basin-wide projects/programs</strong> (Art.2, 1995): some ideas for ‘deals’</td>
<td></td>
</tr>
</tbody>
</table>
Cooperative regional assessment: CRA
analyze options together: boundaries off, then back

Cooperative management:
* Pragmatic/realistic outcomes
* Institutions & benefits analysed
* Equitable benefits distributed
* Legal/institutional framework
Deal or no deals in the Mekong?

Principled negotiations: ‘7 elements’
Good management, governance, political order....

river + dyke = 古治

- Origin of the word “rival”:
  1570–80; < L rīvālis orig., one who uses a stream in common with another, equiv. to rīv(us) stream + -ālis -al1
NOTE: harm is “2-way street”

- Normal assumption: harm flows upstream → downstream
- But, as international watercourse developed by a downstream state, scope for development upstream may shrink
- Such “foreclosure of future uses” is real form of harm… downstream → upstream
- Provision of information on planned measures, downstream ↔ upstream