Socio-economic challenges facing the Indus Basin

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Overview

• Basin basics
• Demographic drivers
• Groundwater and insecurity
• Changes and systemic challenges
• ...Vulnerability
• Conclusions
Basin basics

- 300 million people (380m by 2050 – of which Pakistan 309 million)
- Pakistan drawing 63% of water used; India drawing 36%
- Pakistan dependence on river (98%)
- Indus provides India with 7% annual utilizable surface water
Demographic drivers

- Rapid urbanization
- Demographic pressures on water shortage about x4 as important as long-term shifts in available water due to climate factors
- Pakistan to reach 309 million by 2050
- Municipal water withdrawals x4 in last 20 years in Pakistan; x2 in India
- Youthful, to economically active, to ageing

Groundwater = major source municipal water supply
Groundwater and insecurity

- Importance of groundwater in improving water availability and access ‘yields from self-provided groundwater are twice those of unreliable and inflexible canal supplies’ (WB)
- Groundwater use by private farmers accounts for half irrigation requirements in basin
  - Over 40% of irrigated land area in Pakistan irrigated from mixed surface water and groundwater
  - Low levels of irrigation efficiency (in Pakistan, losses are 40% of diversions)
  - Estimates that basin aquifers lost groundwater at rate of 10 km³/year from April 2002-June 2008, annual amount equivalent to almost half available water storage in Pakistan’s reservoirs
- Over-exploitation, groundwater quality decline in some areas (salts accumulation)
- Salt-affected soils affect about 22% of Pakistan’s irrigated lands; in Indian Punjab overdraft could exceed recharge in 80% of administrative units monitored

Groundwater salinity increases with depth
Changes and systemic challenges

- Pakistan: total annual water withdrawals rose from 153.4 BCM in 1975 to 183.5 in 2008 (total annual renewable dropping from 3,385 m3/cap to 1,396 m3/cap in 2011)
  - Diminishing flows and declining water tables (2-3 metres per year)
  - Total withdrawals nearly equal long-term flow balances and ecosystem needs
  - Reduction in ave annual flows to Indus Delta from 172 to 49 km3 in last 50 years
    - At times the Indus no longer reaches the sea
  - Suggestion that environmental water requirements could equal some 25% of mean annual flows
  - Reduction in ave annual flows to Indus Delta from 172 to 49KM3 in last 5 years
- About 55km3 of wastewater poured into the Indus annually; 90% from agricultural sector
- Water-bourne diseases account for 20-40% of all hospital patients in Pakistan and 1/3 of all deaths

Source: ADB, 2013
...vulnerability: 2010

Table 2  Flood Damage by Sector and Region, 2010 ($ million)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Damage</th>
<th>%</th>
<th>Region</th>
<th>Damage</th>
<th>%</th>
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<tbody>
<tr>
<td>Agriculture and livestock</td>
<td>5,045</td>
<td>50.2</td>
<td>Balochistan</td>
<td>620</td>
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<td>Education</td>
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<td>FATA</td>
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<td>3.1</td>
<td>Gilgit- Baltistan</td>
<td>49</td>
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<td>Khyber Pakhtunkhwa</td>
<td>1,172</td>
<td>11.7</td>
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<td>Finance sector</td>
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<td>6.7</td>
<td>National</td>
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<td>Governance</td>
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<td>0.7</td>
<td>Northeast Pakistan</td>
<td>86</td>
<td>0.9</td>
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<tr>
<td>Health</td>
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<td>0.5</td>
<td>Punjab</td>
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<td>Housing</td>
<td>1,588</td>
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<td>Sindh</td>
<td>4,380</td>
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<td>Irrigation and flood protection</td>
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<td>2.8</td>
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<tr>
<td>Private sector and industries</td>
<td>282</td>
<td>2.8</td>
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<td>Transport and communications</td>
<td>1,328</td>
<td>13.2</td>
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<tr>
<td>Water supply and sanitation</td>
<td>109</td>
<td>1.1</td>
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<tr>
<td><strong>Total</strong></td>
<td>10,056</td>
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</tbody>
</table>

About 6% of GDP

FATA = Federally Administered Tribal Areas.

Note: Percentages may not total 100% because of rounding.


Source: ADB, 2013
Conclusions

• Huge challenge of demand over supply
  – Pakistan already reached limit of available water but will require 30% more by 2025
  – Major need to re-engineer water demand in agriculture (groundwater); arrest water quality decline (environment/health)

• Increases in extreme weather events?
  – Increased long-term and short-term population vulnerabilities
  – Declining overall water availability and quality relative to population size
  – Capacity to feed population declining (virtual water – costs of imports?)

• Population: jobs, migration, urbanization…

• Socio-economic challenge locked into decisions on physical system management and development

• Tough political/political-economic decisions will have to be taken

• A socio-economic atlas of the Indus?