

Basin Futures: Big data supporting rapid basin-scale water assessments

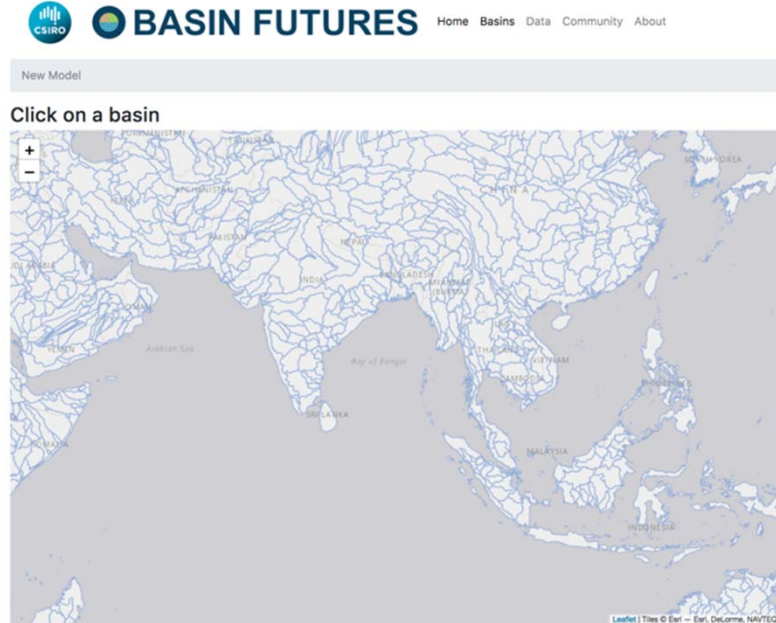


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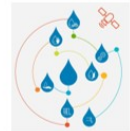
How do we make access to basin assessments easier?

- Motivated by our learnings in South Asia: a ‘fit-for-purpose’ tool for clients
- Doing more with less
 - Limited local data, less data munging, less cost, less time effort, less capacity, lower the barrier to entry (capability)
- Decision focused rather than modelling focused
- How much? Water productivity? Is there opportunity for development?



What are the 'road blocks' to kick-start the process?

- Information: Inputs - working assumption is that local data is needed; Outputs - not always fit for purpose for decisions
- Innovation: Whilst the science and practice of water planning is well explored, the implementation and ease of taking the first steps is not
- Technology: Workflows are not intuitive; Data access is challenging and processing cumbersome; Visualisations limited

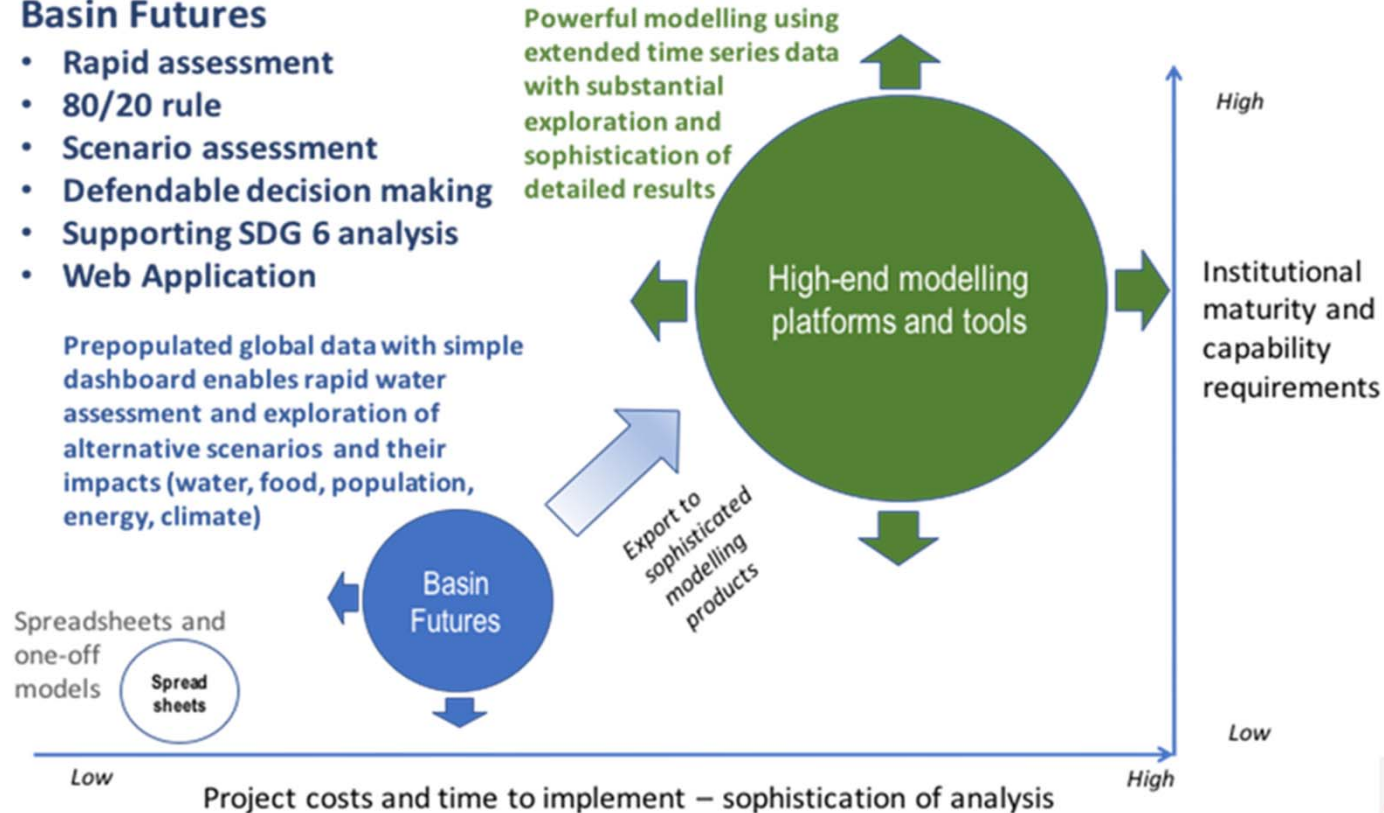


Creating a pathway - basic to sophisticated

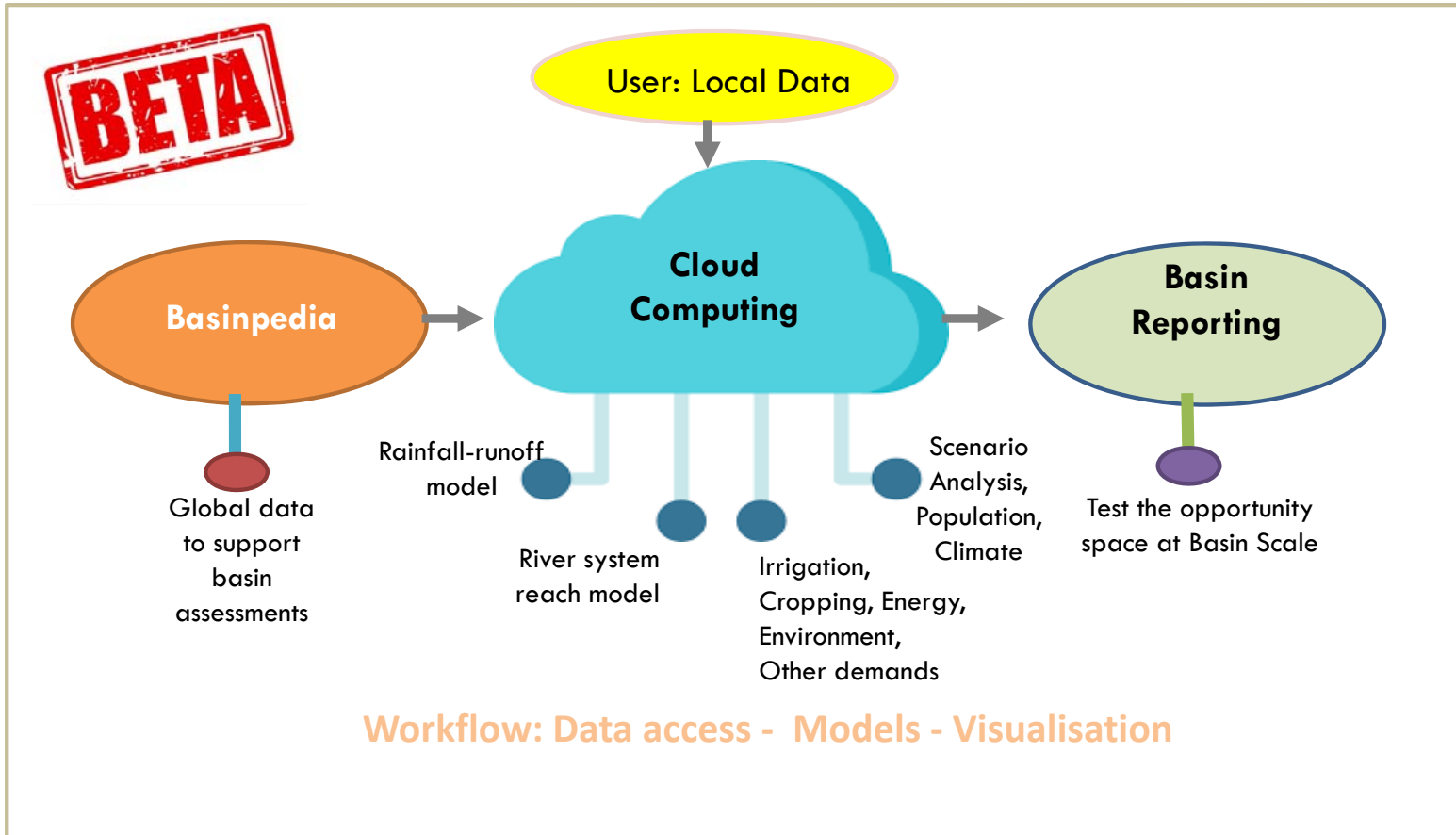
Basin Futures

- Rapid assessment
- 80/20 rule
- Scenario assessment
- Defendable decision making
- Supporting SDG 6 analysis
- Web Application

Prepopulated global data with simple dashboard enables rapid water assessment and exploration of alternative scenarios and their impacts (water, food, population, energy, climate)



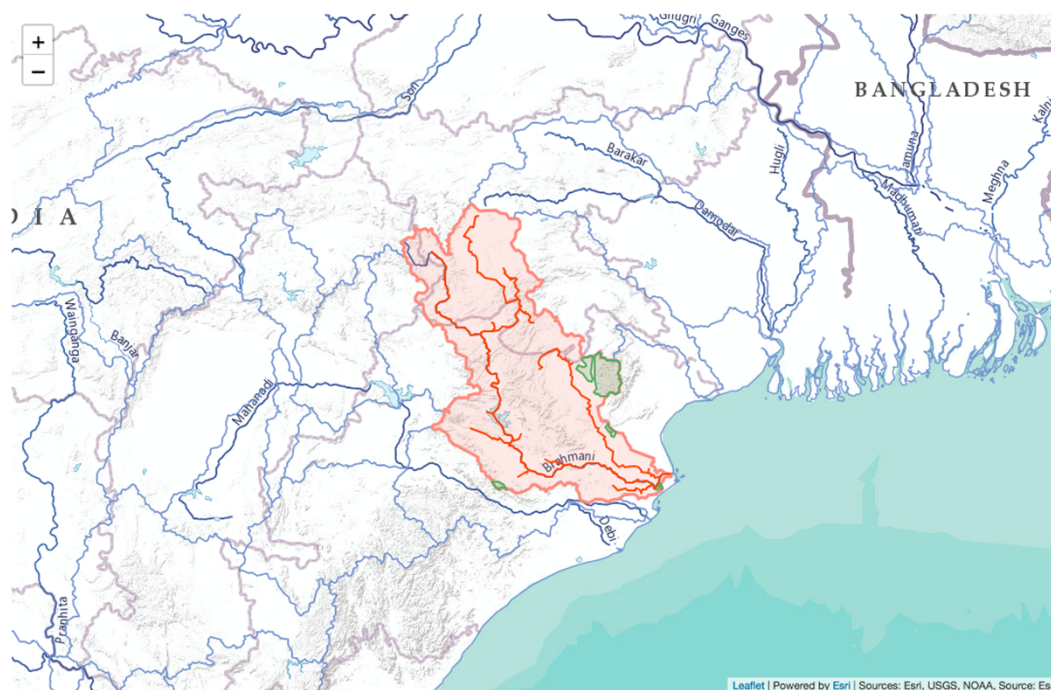
Information, Innovation, Technology



Bringing together global datasets

Basin in district of Balrampur

Detailed river network Storages Admin areas



Basin name: brahmani river (bhadmani) (India)

Population: 14,227,632

Area: 51,414 km²

Countries:

[Land use](#) [Protected Areas](#) [Borders](#) [Stress indicators](#) [Species](#)

Stress Indicators

● Baseline Water Stress - 3. Medium to high (20-40%)

● Inter-annual Variability - 2. Low to medium (0.25-0.5)

● Seasonal Variability - 5. Extremely high (>1.33)

● Flood Occurrence - 5. Extremely high (>27)

● Drought Severity - 1. Low (<20)

● Groundwater Stress - No data

● Media Coverage - 2. Low to medium (0.05-0.1%)

[Create model](#)

Building on local knowledge

Reaches

Name	Area	Storage	Crops
Basin outflow	95 km ²	GL	0
Torpa area	2,539 km ²	GL	0
Gumla	4,916 km ²	GL	0
Barbil	4,963 km ²	GL	0
Rourkela	6,924 km ²	GL	0
Rengali	7,797 km ²	GL	0
Tampar	2,486 km ²	GL	0
Baitarni	11,944 km ²	GL	0
Bhuban	9,750 km ²	GL	0

Editing Rengali

[Basic Information](#)

[Runoff](#) **monthly**

[Transfers](#) **0 transfers in | 0 transfers out**

[Storages](#) **✓**

[Agriculture](#) **0**

[Demands](#)

[Environment](#)

Percentage of storage flow for environmental flow



Scale globally through cloud computing technology

Run details

Run period: 1995 to 2015 (20 years)



Run model

Model run details

Quick scenarios

Model status ✓

Minimum climate data is available from 1981 to 2015.

[Model errors](#) 0

[Model warnings](#)

Basin Futures version 0.11.0.



Visualising scenarios of change

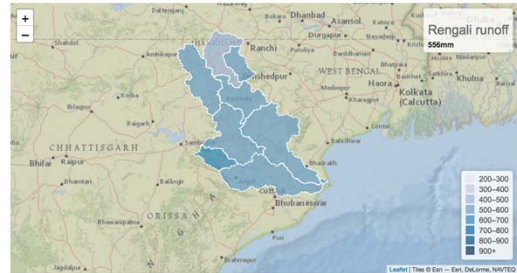
Model Results Scenarios

Whole of basin

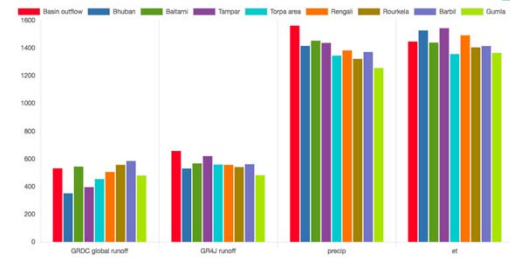


Reach summaries

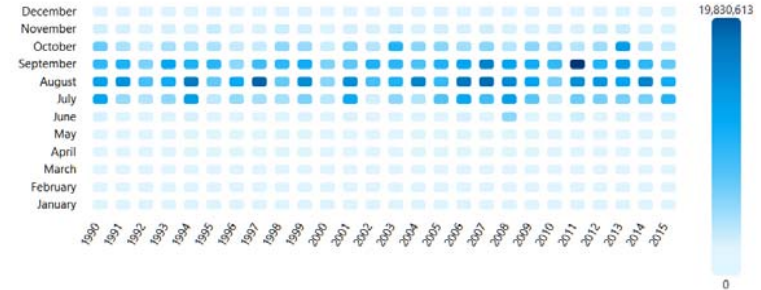
Runoff contribution by reach



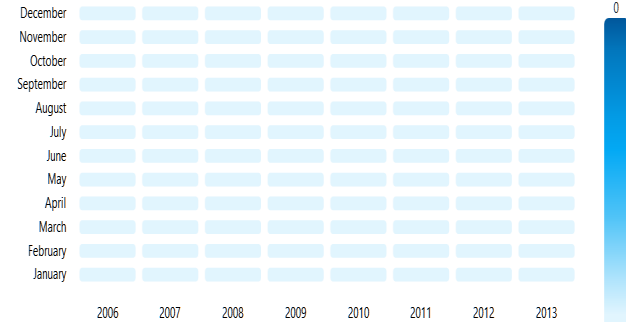
Average annual climate and runoff (mm)



Monthly Flows (ML)



Monthly Flows (ML)



Agriculture

Annual crop yield

Crop type	Harvest date	Yield (kilotonnes)	Value (US M\$)
Rice (paddy) - irrigated	06 December	3613415	2348719.75
Rice (paddy) - irrigated	05 January	3613415	2348719.75

Download results

Annual Water Use (ML)

total_demand environment reach_outflow irrigation_use



Exploring water security at basin scale

Information

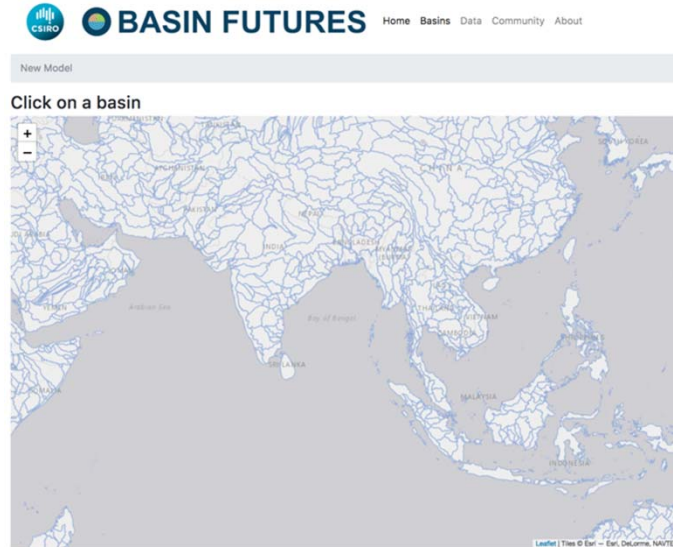
- How much water is in my basin?
- What is the water productivity?
- How does this change under climate and development scenarios?

Innovation

- Creating a pathway – basic to sophisticated

Technology

- Accessibility: faster, cheaper and reducing the barrier to entry
- Relevance: Outputs are decision ready



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Winner of the Big Data
Challenge for Watershed
Management



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