# The practicalities of managing EFlows Assessments

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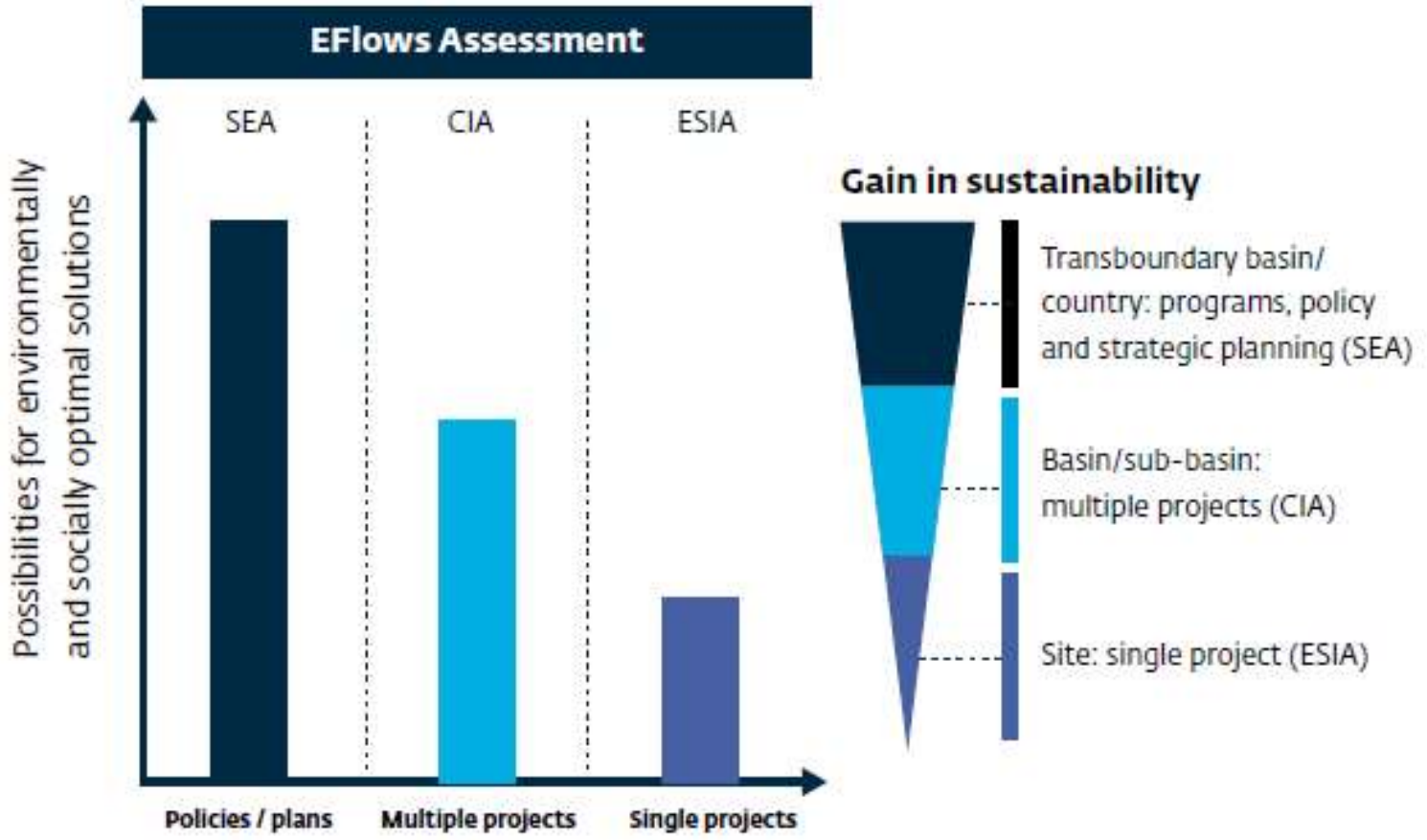
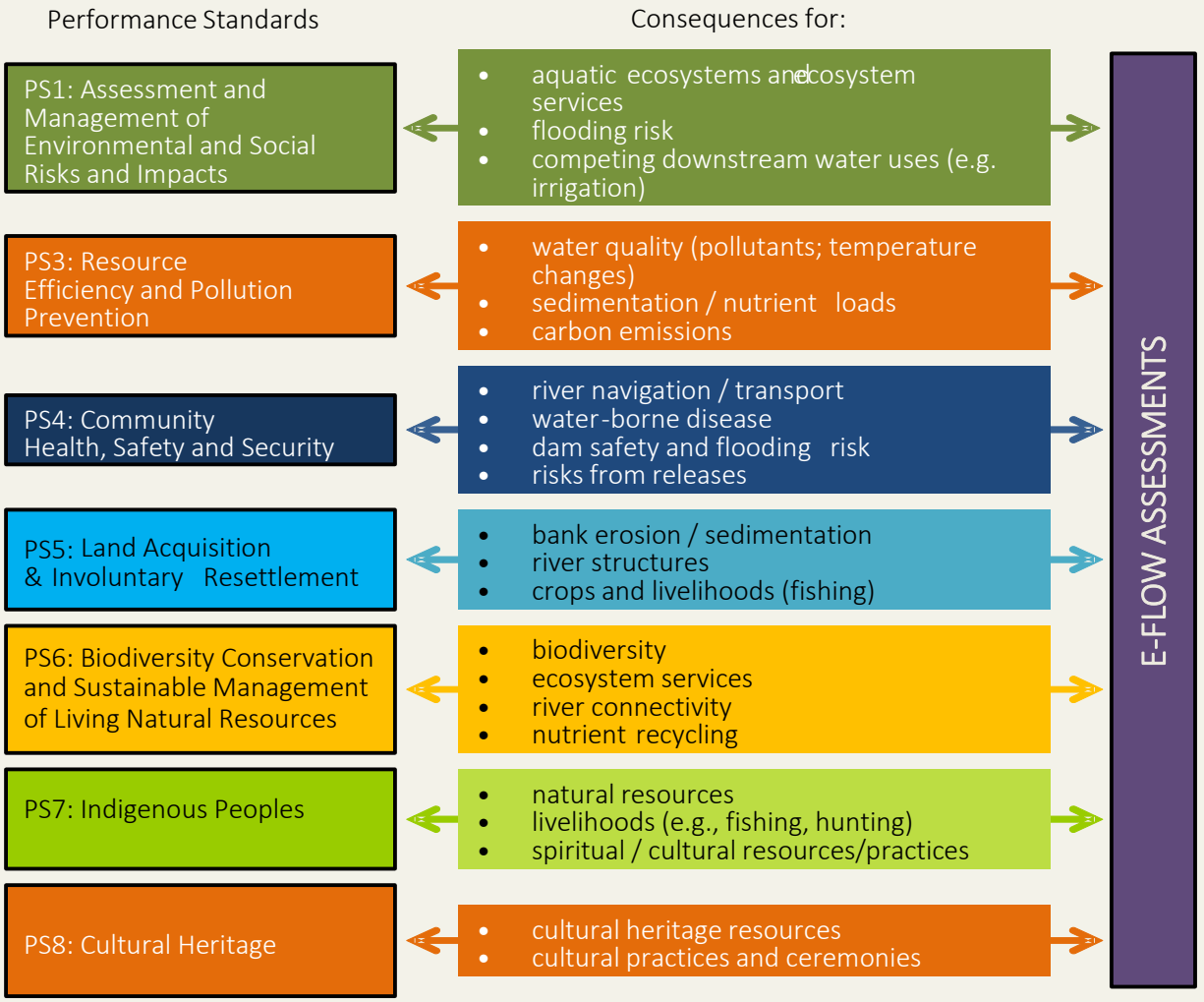
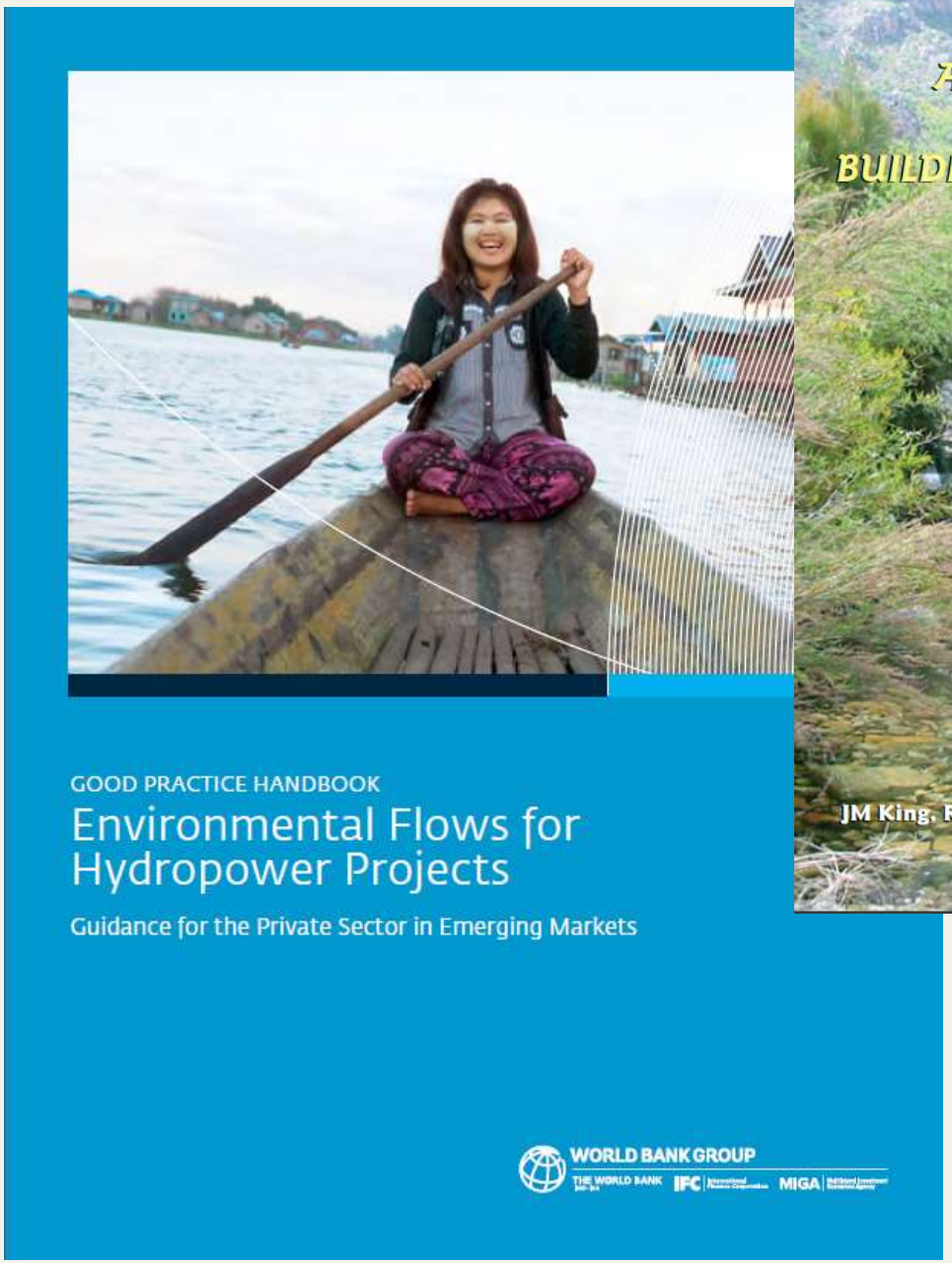
WIO EFlows Guidelines Workshop
September 2019
Cape Town

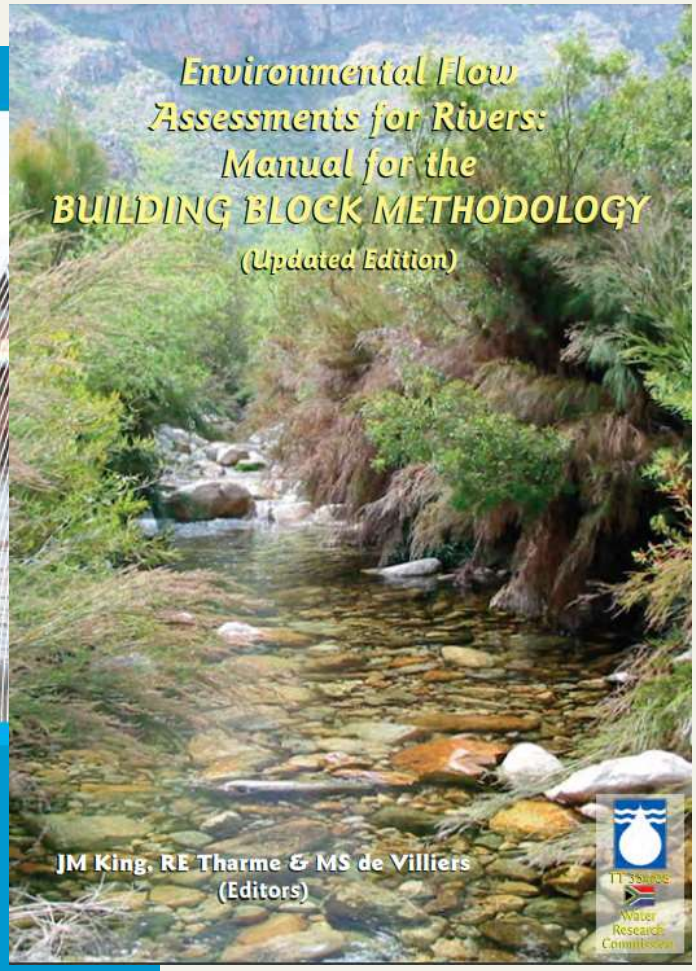
# Relationship with Assessment Tools



# E-Flows: Key cross-cutting component



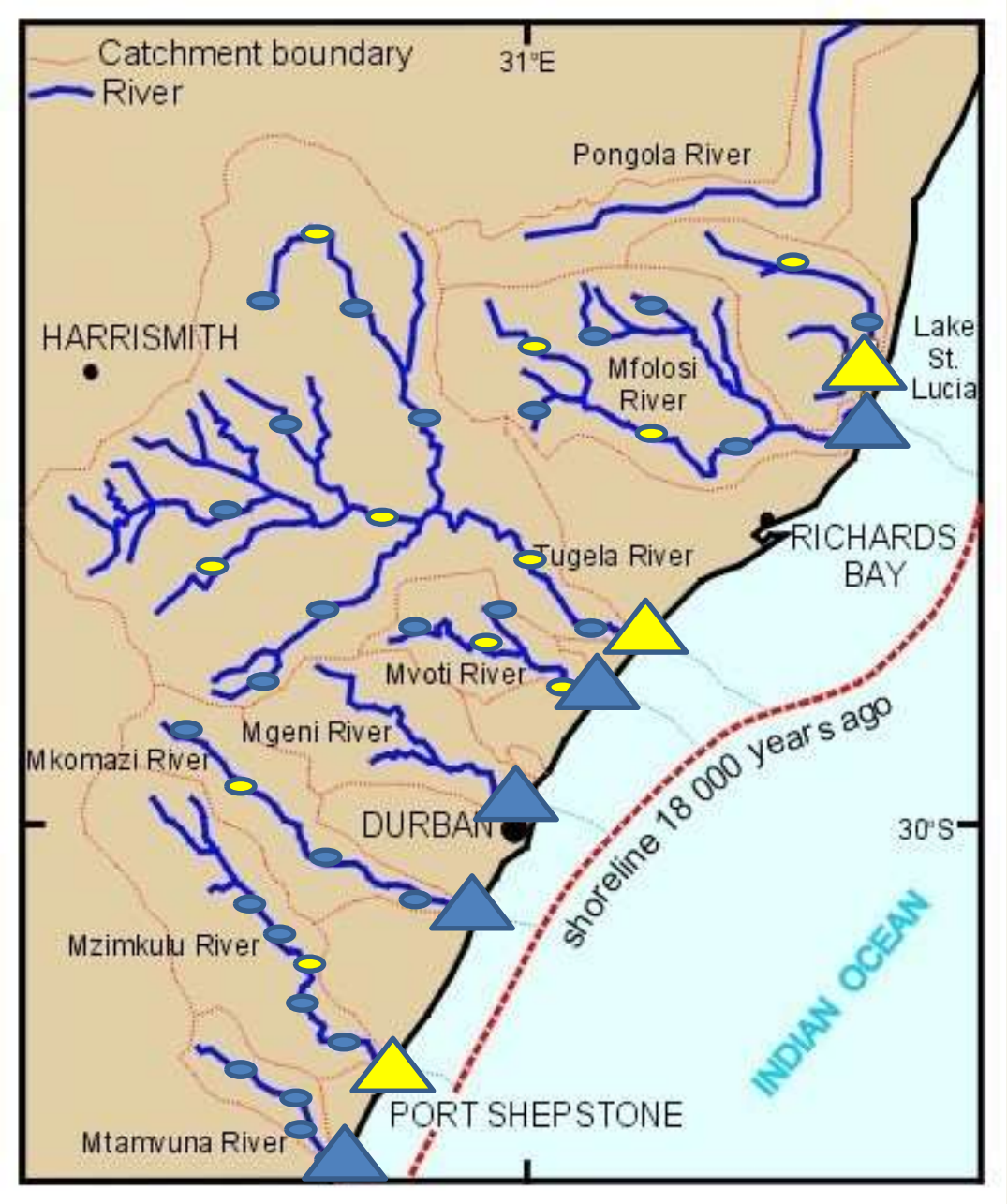

GOOD PRACTICE HANDBOOK
Environmental Flows for Hydropower Projects
Guidance for the Private Sector in Emerging Markets
WORLD BANK GROUP
THE WORLD BANK
IFC
MIGA

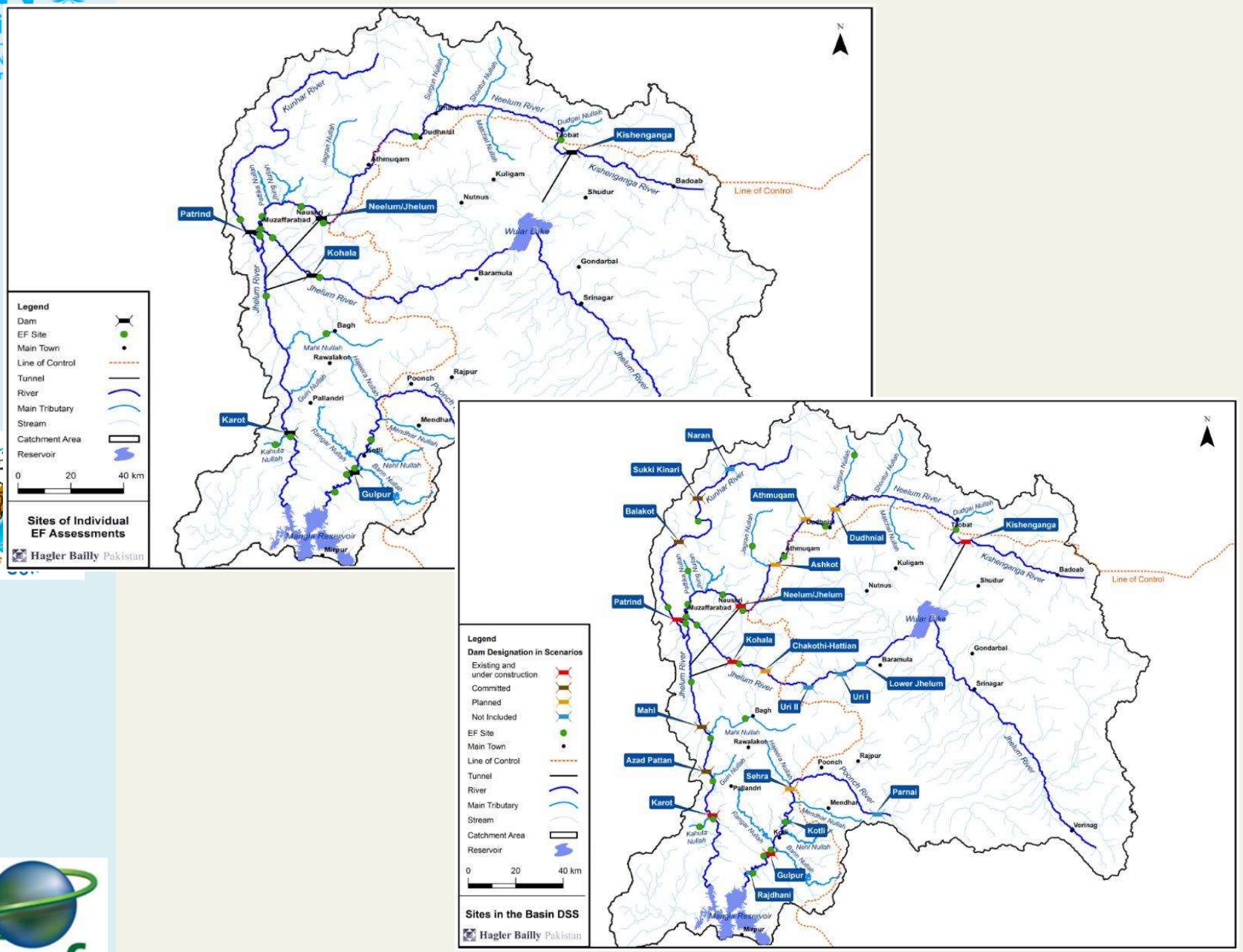

Environmental Flow Assessments for Rivers: Manual for the BUILDING BLOCK METHODOLOGY
(Updated Edition)
JM King, RE Tharme & MS de Villiers
(Editors)
Water Research Commission

# Main considerations

- Objectives
- Study area/Features of the river basins
- Stakeholders
- Scenarios for evaluation
- Budget
- Available data
- Capacity
- Technical approach
- Cross-linkages with other management processes/issues
- Expected outputs
- Decision making processes

# Study area


Catchment boundary
River
31°E
Pongola River
HARRISMITH
Mfolosi River
Lake St. Lucia
RICHARDS BAY
Tugela River
Mvoti River
Mgeni River
Mkomazi River
DURBAN
30°S
shoreline 18 000 years ago
INDIAN OCEAN
Mzimkulu River
PORT SHEPSTONE
Mtamvuna River

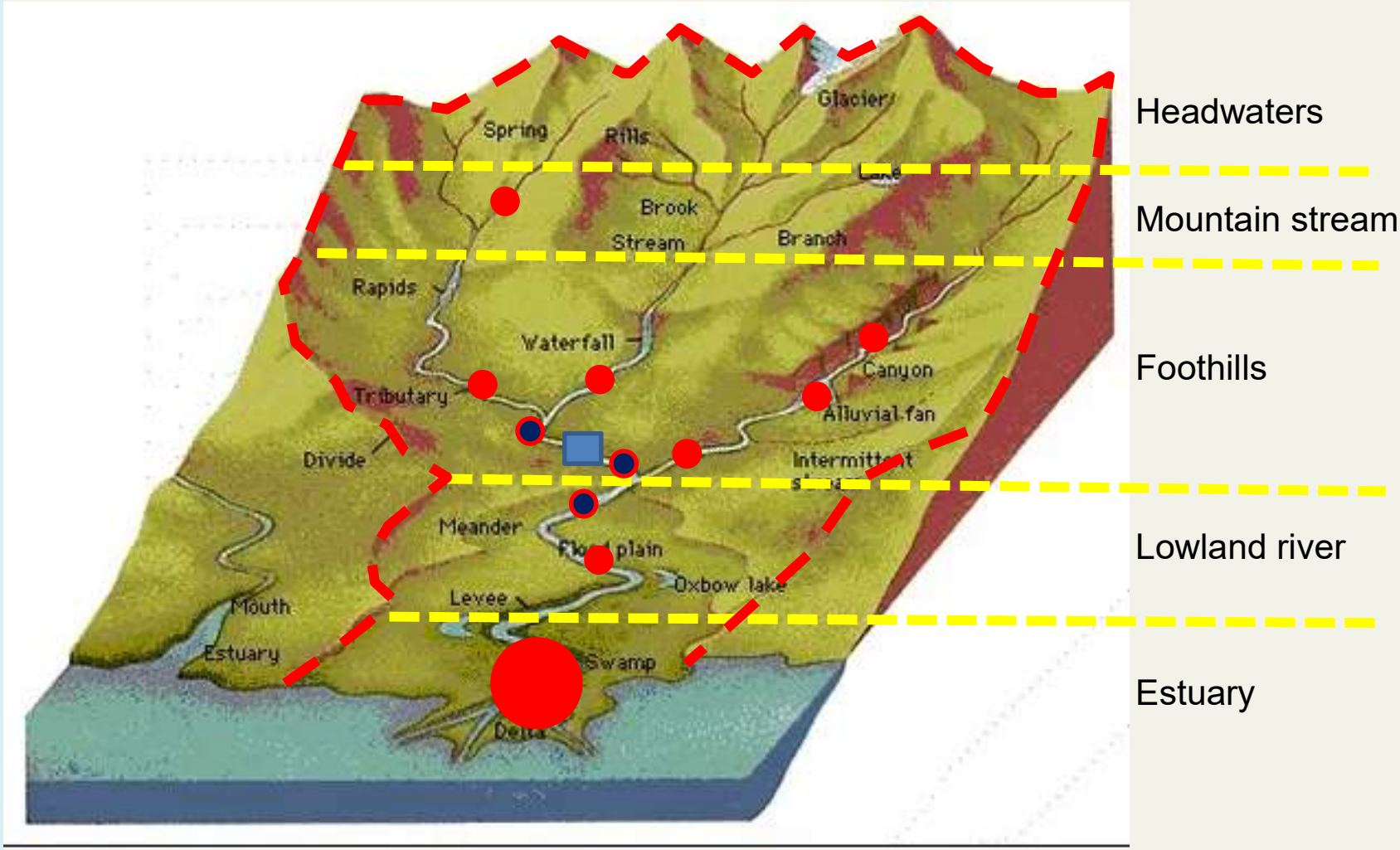

N
Kunhar River
Sugran Nullah
Shoutur Nullah
Neelum River
Dudgai Nullah
Dharve
Dudhnial
Tobat
Kishenganga
Jagran Nullah
Athmuqam
Mastehal Nullah
Kuligam
Kishenganga River
Badoab
Line of Control
Nutnus
Shudur
Patrind
Patika Nullah
Dang Nullah
Nausari
Muzaffarabad
Neelum/Jhelum
Wular Lake
Kohala
Gondarbal
Baramula
Jhelum River
Srinagar
Bagh
Mahl Nullah
Rawalakot
Poonch River
Rajpur
Gun Nullah
Pallandri
Poonch
Karot
Mendhar
Mendhar Nullah
Kahuta Nullah
Kotli
Nehl Nullah
Bans Nullah
Gulpur
Mangla Reservoir
Mirpur
Legend
Dam
EF Site
Main Town
Line of Control
Tunnel
River
Main Tributary
Stream
Catchment Area
Reservoir
0
20
40 km
Sites of Individual EF Assessments
Hagler Bailly Pakistan
Naran
Sukki Kinari
Balakot
Ashkot
Chakothi-Hattian
Lower Jhelum
Uri I
Uri II
Mahl
Azad Pattan
Sehra
Parnai
Verinag
Rajdhani
Legend
Dam Designation in Scenarios
Existing and under construction
Committed
Planned
Not Included
Sites in the Basin DSS
Hagler Bailly Pakistan

# Stakeholders

- Stakeholders identification
  - Government
  - NGOs, NPOs, etc.
  - Civil society
  - Unions, groups, for a
  - International organisations
  - Funders and donors
- Stakeholder mapping
  - Type
  - Location
  - Main issues of concern
  - Connection with EFlows assessment
- Communication strategy

# Scenarios

- Scenarios are a means of exploring possible pathways into the future
- Describe a range of potential development of the river (design, location and operation of infrastructure/abstractions)
- EFlows assessment will only address PART of information needed for a scenario
- Dedicate process for scenario selection
- Informs method, site and indicator selection


Glacier
Spring
Rills
Brook
Stream
Branch
Rapids
Waterfall
Canyon
Tributary
Alluvial fan
Divide
Meander
Oxbow lake
Levee
Mouth
Estuary
Swamp
Delta
Headwaters
Mountain stream
Foothills
Lowland river
Estuary

# Budget

- Available budget and phasing
- Options for:
  - stretching the budget:
    - study area/sites
    - study components
    - method selection/combinations
    - study team
    - etc.
  - sourcing additional budget:
    - funders/donors
    - users of outputs

# Available data

- Location, reliability, record length and time-steps of recorded hydrological data
- Topographical data - DEMs
- Water quality data
- Sediment data
- Plant and species lists
- Socio-economic data

- Options for generating data
- Options for estimating:
  - E.g., sediments

# Tips on handling data deficiencies

- Hydrology – rainfall/runoff modelling
- Hydraulic - hydrology as proxy
- Sediments and WQ – proportional change
- Habitat characterisation:
  - Google Earth/Satelite imagery
  - Field observations
  - Physics basics
- Species assemblages:
  - Literature
  - Field sampling
- Life-histories:
  - Literature (same/similar species)
  - EFlows on similar rivers
  - Field sampling

# Handling data deficiencies

- DRIFT works on RELATIVE change
- First principles
  - Physics
  - Ecology
- Expert opinion
  - Use local experts
  - Team with experienced experts if needed

# Capacity

- Administrative:
  - Financial management
  - Project oversight
  - Process and systems for storing and disseminating results
  - Decision-making processes; setting EFlows
  - Implementation and monitoring
- Technical:
  - Management of technical EFlows process(es)
  - Hydrology, hydraulics and modelling
  - Water quality
  - Sediments, geomorphology
  - Specialists (ecology and socio-economics)
- Options for supporting and building capacity

| # | Considerations |
|---|---|
| 1 | Were Stakeholders adequately engaged at all points in the process? |
| 2 | Is there a review of existing knowledge about the aquatic ecosystem?<br>• hydrological/sediment/WQ characteristics<br>• ecological attributes and key features of sensitivity<br>• ecological condition<br>• social uses and level of dependence on aquatic ecosystem services. |
| 3 | Is there a delineation of the basins/sub-basins?<br>• Are there any floodplains likely to be affected?<br>• Are there any ecosystems other than rivers likely to be affected? |
| 4 | • Do the EFlows sites cover the study area; do they maximise potential for extrapolation |
| 5 | Does the level of assessment meet the objectives of the study?<br>• If not, are compelling reasons provided for why not? |
| 6 | Do the indicators cover stakeholder concerns? |
| 7 | Is the EFlows Assessment method correctly applied and referenced?<br>• Are the calculations shown and reasoning provided?<br>• Are the EFlows contextualised within the hydrological regime of the river?<br>• Are the limitations of the EFlows assessment made clear? |
| 8 | Are the potential effects of changes in the longitudinal movement of sediments, fish and other organic and inorganic materials adequately described and addressed? |
| 9 | Is operation of infrastructure addressed? Peaking power production?/Sediment flushing? |
| 10 | Has a decision been made and is it recorded in a manner that will facilitate implementation? |

# Expected outputs

- Ecosystem condition
- Reports
- Data and models
- Monitoring targets
- Monitoring programme
- Capacity building

# Implementing EFlows

- Deciding on EFlows allocations
  - EFlows management plans
- Harmonizing policies and working with government agencies
- Building managerial and technical capacity in E-Flows Assessment
- EFlows information systems
- Funding to support EFlows implementation

# Practical Tasks

- Identify rivers important to the marine environment (Google Earth)
- Select a study area
- Select ecosystems for inclusion in EFA (Google Earth)
- Gather additional information for selected river(s) (Google Earth):
- Select provisional EFlows sites/zones/areas
- Design future scenarios to be evaluated
- Identify partners in study:
- Identify key questions / issues to be addressed by EFA
  - ID four main questions/concerns of key Stakeholders
  - Identify other priorities that could be addressed through design of the SoW for an EFA
- Select a method **type** or types suggested for use in the EFA.
- ID baseline data that will be needed for EFA and potential sites for monitoring.