

BioRA Preparation Meeting PART I
Office of the Secretariat in Vientiane
18 – 19 March 2015

MRC Council Study: Overview of the BioRA

www.mrcmekong.org



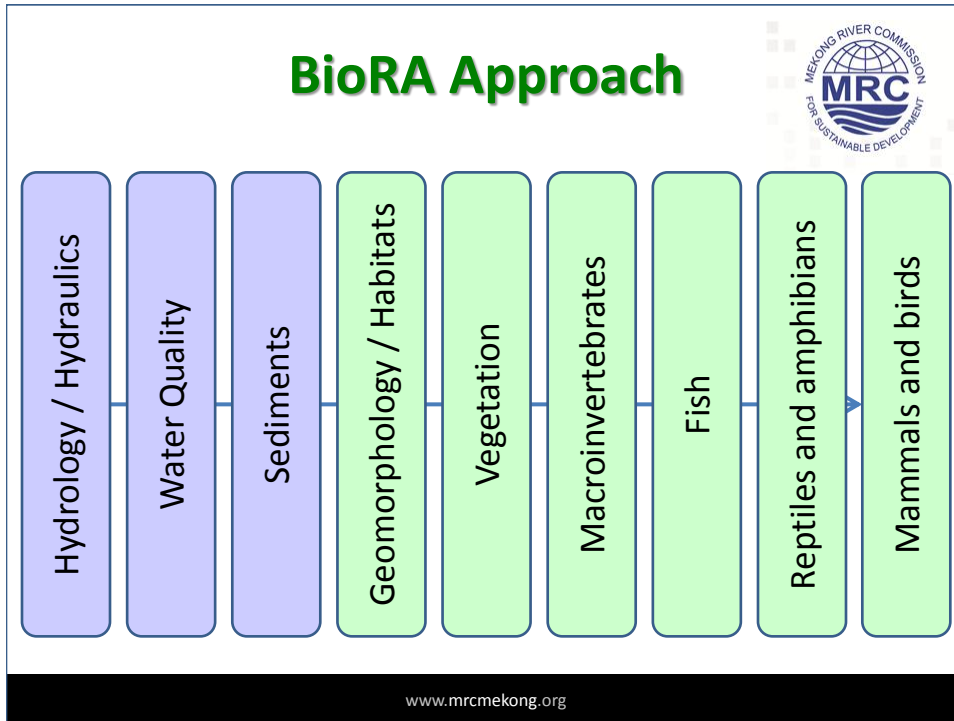
Objective of BioRA



To provide clear and comparable information on the impacts of proposed thematic developments on the aquatic resources of main-stem Lower Mekong River, inclusive of the Tonle Sap Great Lake and the Mekong Delta.

- *Great detail than in SEA or BDP*
- *Transparent*
- *Repeatable*

www.mrcmekong.org



DRIFT

- Knowledge management system for use where quantitative models are not available:
 - Incorporates time-series data from calibrated hydraulic, sediment and water quality models
 - For other aspects of the ecosystem, it captures expert opinion; where possible calibrated with time-series data
- Software and a structured process
- Main BioRA task is to set up and calibrate the DRIFT DSS and provide supporting motivations and documentation
- Allow for consideration of a range of scenarios

www.mrcmekong.org

BioRA Team



Management:

- Dr So Nam, Dr Peter Degan, Dr Cate Brown; Dr Alison Joubert

International and Regional Consultants:

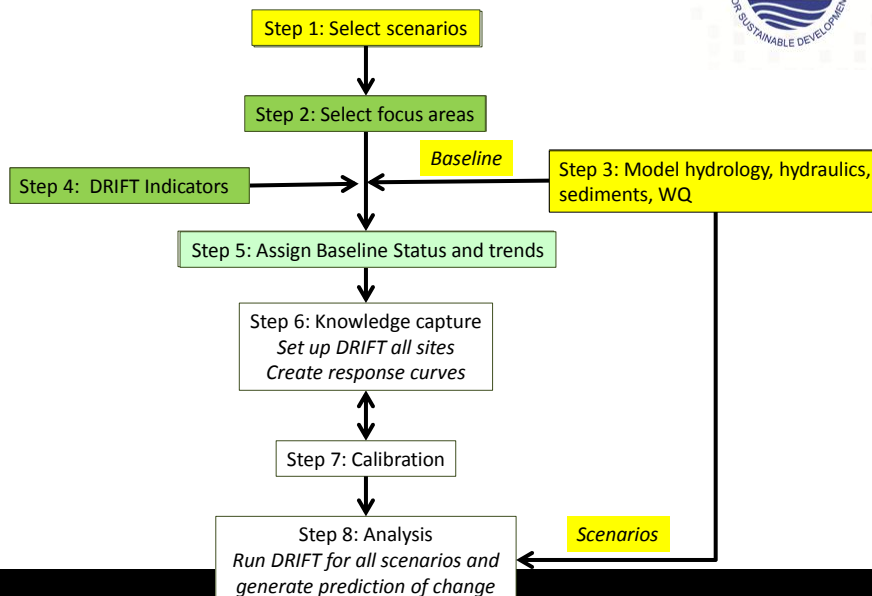
- Geomorph/WQ: Dr Lois Koehnken
- Vegetation: Dr Andrew MacDonald
 - Macrophytes (delta): Dr Nguyen Thi Ngoc Anh
 - Algae (delta): Ms Duong Thi Hoang Oanh
- Invertebrates: Dr Ian Campbell
- Fish: Dr Ian Cowx, with Dr Kenzo Utsugi (Delta support)
- Mammals and birds: Mr Anthony Stones
- Frogs and reptiles: Dr Hoang Minh Duc
- Tonle Sap processes: Dr Dirk Lamberts

National Counterparts:

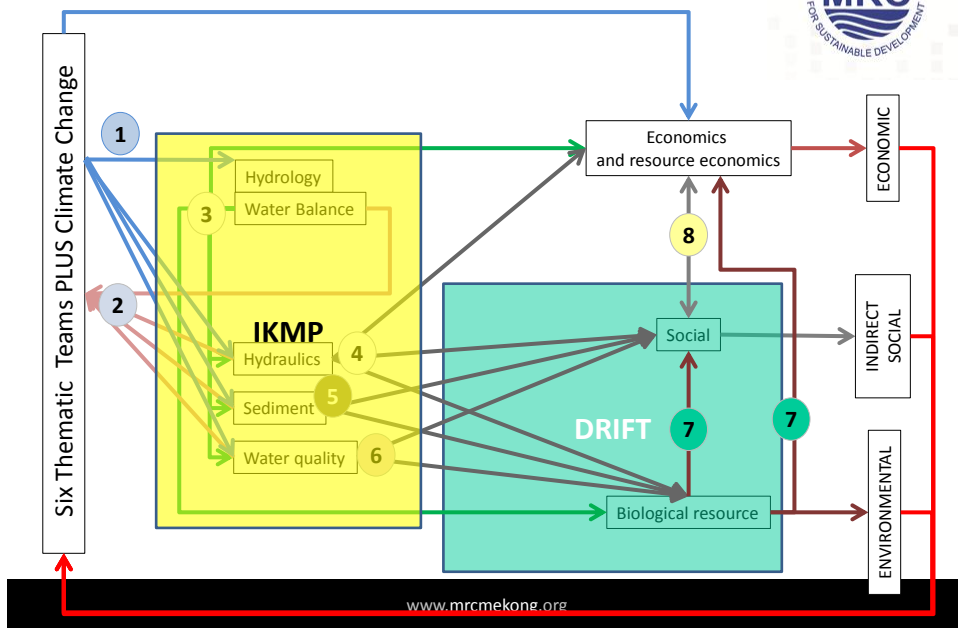
- Geomorph/WQ; Vegetation; Fish; Fauna (excl. fish)

www.mrcmekong.org

Main steps in BioRA



Summary of main data flow



Contracts:	Feb/Mar 2015
Preparati	DELIVERABLES 2015
Field Visit	Report 1: Indicators and Focus Area 2015
Baseline S	Report 2: DSS Set-up 15
Field Visit	Report 3: Specialist Reports July 2015
KCW – riv	Report 4: Populated and calibrated DRIFT DSS Oct 2015
Calibratio	Report 5: Thematic scenarios November 2015
KCW – De	Report 6: Cumulative scenarios November 2015
Specialist	Scenario Assessment & reporting: March/June 2016

Outputs of Preparation Meetings and Field Visits



- ❑ Report: Site Selection and Field Visits. This will contain, *inter alia*:
 - Proposed final selection of focus sites/areas
 - Site descriptions from individual specialists for the Tonle Sap rivers, the Tonle Sap Great Lake and the Delta
- ❑ Report: BioRA Indicator Selection
 - The preliminary lists of BioRA drivers and indicators
 - Linkages between BioRA drivers and indicators (BioRA assessment framework)
 - Relationship to MRC/BDP/Scenario indicators
 - Suggested additions/adjustments to MRC/BDP/Scenario indicators
- Schedule of follow-up activities
- Summary of main issues arising for Preparation Meetings Part 1 and 2
- Copies of presentations made at Preparation Meetings Part 1 and 2

www.mrcmekong.org



www.mrcmekong.org

Key points

- Water-resource scenarios
- National Counterparts
- Focus Areas
- Indicators and Linked Indicators
- Baseline Status Assessments
- Knowledge Capture
- Calibration
- Specialist Reports
- Scenario Evaluation and Reporting

www.mrcmekong.org



Water-resource development scenarios

- Themes: Irrigation; Agriculture and land-use; Domestic and industry; Flood infrastructure; Hydropower; Navigation; Climate change
- Location: Mainstem and/or tributaries
- Direct effects: Hydrology, sediment supply and transport, water quality, channel shape, habitat loss (inundation), connectivity(migration)
- Hydrological period: - probably 1985-2007
- Scenarios: 2020; 2040; exploratory scenarios (2040/2060)

www.mrcmekong.org



National Counterparts



- c. 4 counterparts from each MC”
 - Water quality and geomorphology
 - Fish
 - Animals, excl. fish
 - Plants
- Letter submitted to MCs
- Names received – selection on going
- Link with relevant lead specialists
- Involved in all activities

www.mrcmekong.org

Selection of focus areas



1. Location of developments in scenarios not known
 2. Reaches/areas rather than sites
 3. Structure delineation selection process
- Establish a network of biophysical nodes:

– Mainstem	OSV
– Tonle Sap System	Siem Reap
– Delta	
 - Group river nodes into Integrated Units of Analysis
 - Select focus areas within each IUA
 - Allocate nodes to socio-economic indicators

www.mrcmekong.org

Indicators and Linked Indicators

- Compile preliminary list
 - Working from draft lists
 - Workshop tomorrow – linked indicators
 - Session at Siem Reap
- Submit preliminary list of indicators and linked indicators
- Review by Council Study team members
- Set-up DRIFT
- Knowledge capture

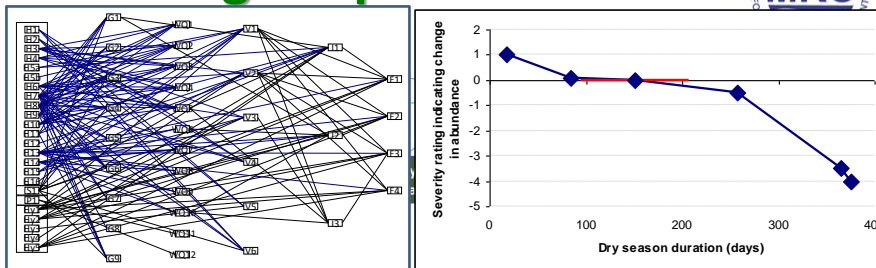
www.mrcmekong.org

Baseline status and trends

- Current (2015) status and trajectories of change for each indicator at every focus area:
 - Identify main driving forces influencing baseline status
- ‘Exogenous’ baselines:
 - Past conditions:
 - 1900; 1950; 1990; 2000; 2007
 - Future conditions:
 - Situation in absence of water-resource development
 - 2020; 2040; 2060

www.mrcmekong.org

Knowledge Capture



- Sequential/staggered drafting of Response Curves
 1. Geomorphology
 2. Biota
- Individual sessions ahead of main workshop
- Iterative
 - Indicators and linked indicators may change
 - Motivations for RC must be provided

www.mrcmekong.org

Calibration

- Run 'calibration' scenarios to assist with calibrating RCs:
 - Naturalised scenario
 - Extreme scenarios
 - Stepped scenarios
 - Development and exogenous scenarios
- Workshop(s) in Vientiane
- One-on-one sessions facilitated by Skype/email

www.mrcmekong.org

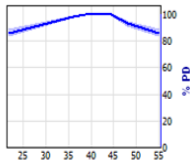
Specialist Reports



1. Discipline-specific description of study area
2. Indicators:
 1. Reasons for selection
 2. Description
3. Baseline status and trends
4. Response curve evidence-based motivations

Dry season onset [D season]

Desc	cal week	Y
Min	21.78	-0.80
MinPD	36.00	-0.10
	38.50	0.00
Median	41.00	0.00
	44.50	0.00
Max PD	48.00	-0.40
Max	55.00	-0.80



The fish need sufficient time prior to the onset of the dry season to accumulate food reserves and energy required for maturing of eggs and spawning (Bell 2006; Bagenal 1969). Breeding is triggered by a drop in water temperature, associated with a drop in flow, and should coincide with the maturation of eggs in the fish (Wootton 1998; Pender and Kwak 2002).

Onset of the dry season before September (week 35) could mean that the triggers for breeding occur before the eggs have sufficiently matured. Breeding success would be compromised if spawning takes place at this time (Baltz et al. 1987).

A delayed onset of the dry season could result in the fish having mature eggs but missing the temperature cue for breeding (Pender and Kwak 2002). Eggs could perish within the fish and be reabsorbed. Flows in the breeding areas would probably be high and may not be appropriate for construction of redds (eggs would wash away).

www.mrcmekong.org

Scenario Evaluation and Reporting

- Run scenarios through the DRIFT DSS
- Specialists to review outcomes
- Make adjustments to Response Curves if and where deemed necessary
- Draft the reports:
 - Thematic
 - Cumulative
- Specialists to review and discipline-specific inputs to reports

www.mrcmekong.org



Thank you

www.mrcmekong.org