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BioRA progress presentations



Prepared by
BioRA Team

5th RTWG Meeting
Siem Reap, Cambodia
13-14 August 2015


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BioRA progress presentations

1. Overview of DRIFT and use of response curves
2. Preparation Meetings and Field Trip I
3. Selection of indicators and focus area
4. Status and trends assessment
5. DSS set-up



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No	BioRA Tasks	Status
1	Source & appoint lead specialists & national consultants	Done
2	Preparation meeting, and indicator and site selection	Done – PR 1
3	Field visit Part I	Done – PR 1
3	Field visit Part II	Cancelled
4	Collation & preparation of relevant data and information	Ongoing
5	Status and trends assessment	Done – PR 2
6	DSS Set-up: Knowledge Capture	Ongoing
7	DSS Set-up: Calibration Workshops	Not started
8	Assessment of water resources development scenarios	Not started
9	Specialist reports and internal review	Ongoing
10	Technical reports for input to Thematic & Cumulative Reports	Not started

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Overview of DRIFT and use of response curves

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Contents



- What is needed for Council Study
- What DRIFT provides
- Use of response curves
- BioRA notes addressing issues

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What is needed for Council Study



- 6 thematic areas
- 3 main development scenarios, plus baseline
- 2 - 3 sub-scenarios for each thematic area
- Three climate change scenarios
- BioRA results for 24 scenarios – for aquatic ecosystems

-> A Model is needed



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What DRIFT provides

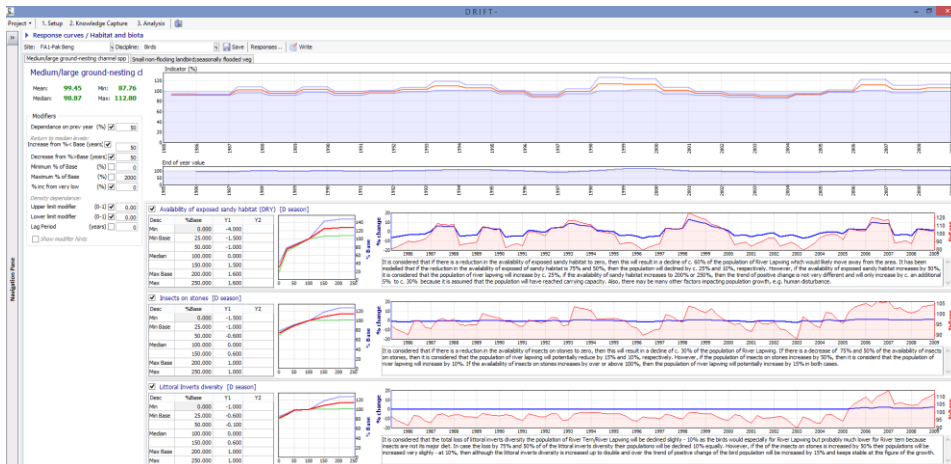


- Framework
 - Set of tools to facilitate data entry and presentation of data
 - No pre-set equations or rules that influence the outcome
 - No pre-loaded data
- All outcomes based on decisions made about the LMB
 - Modelled hydrology, hydraulics, sediments and water quality
 - Response curves
 - Consistent results
 - Multiple scenarios
- Process for formulating response curves
 - Transparent and participatory (with the national consultants)
 - Consensus opinion of 2-5 specialists
 - Based on available data
 - Justifications provided for every response curve
 - Completely transparent, can be easily independently reviewed
 - Can be updated/enriched based on monitoring to support future projects

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Response curves are:

constructed for LMB justified using available data completely transparent



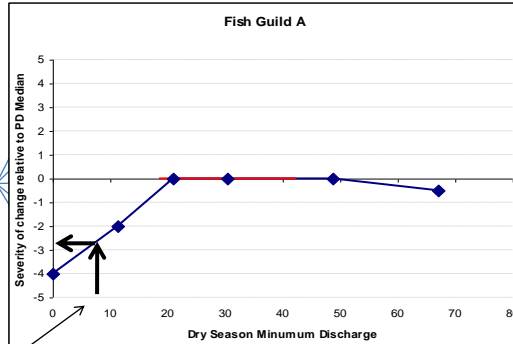
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Use of response curves



External modelled time series

Transformed into time series of DRIFT driving indicators



Scenario: Dry season minimum discharge for each year

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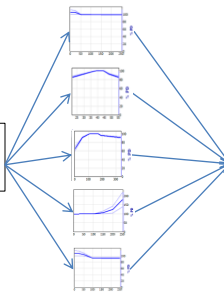
Use of response curves



External modelled time series

Transformed into time series of DRIFT driving indicators

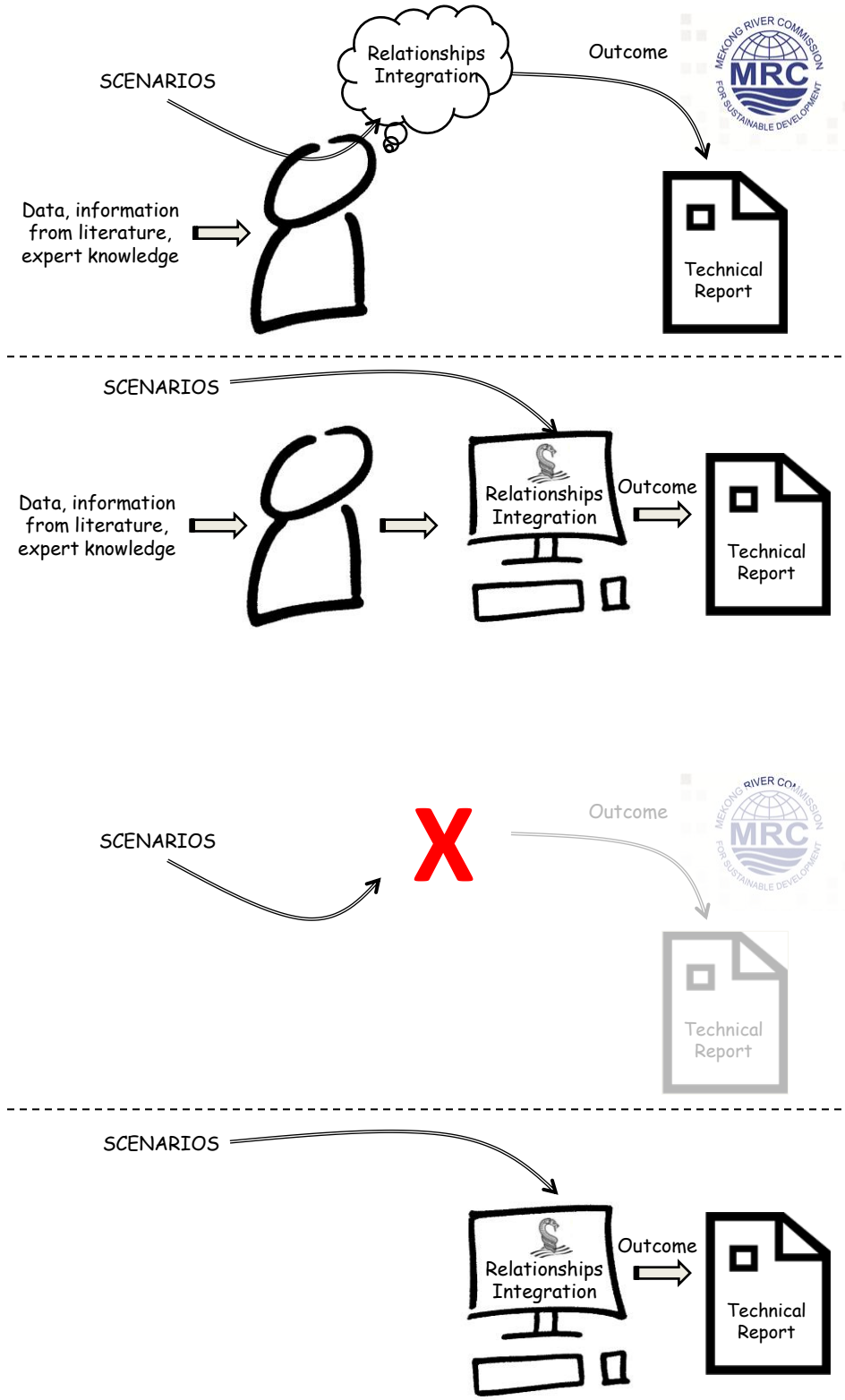
Each responding indicator



DRIFT prediction of change for each year
30 years of record = 30 values

Curves combined using multi-criteria decision analysis procedures

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BioRA notes addressing issues



In addition to information in Inception Report (October 2014) and BioRA Progress Reports (April 2015 and August 2015):

- November 2014: Comparison between Environmental Flow Assessment Tools
- January 2015: Updates in DRIFT (2015) relative to IBFM (DRIFT 2003)
- May 2015: Response to BDP on their Guidance Note for BioRA



Other criticisms



- “Never been applied ... in the LMB”:
 - Not true – used in IBFM
 - *“The IBFM predictive spreadsheet tool represents a substantive and remarkable piece of work undertaken to compare, albeit largely qualitatively, the impact of three particular flow regimes on the ecological, social and economic status of the basin”* Halcrow (2009)
- “Use methods that have been applied in LMB”:
 - Baran et al. : Bayesian (Bayfish) Tonle Sap Fisheries
 - Hall and Welcome: Ecosystem (ADynamic Model) Dai Fisheries
 - Baird et al.: Expert opinion (No established framework) Songkram River Basin, Thailand
 - Rapid E-flows: Huang River Basin, Vietnam assessment

The RTWG is specifically requested to:



Take note of the following key points:

- DRIFT has been widely applied, including in LMB
- Several documents have been prepared in support of use of DRIFT, including review of EF tools and advances since IBFM
- DRIFT has been applied in other large transboundary basins, such as Okavango and Zambezi Basins
- DRIFT is a sustainable, scale-able database that can be updated as more information becomes available

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MRC Council Study: Preparation Meetings and Field Trip I: The Mekong Delta and Tonle Sap Great Lake



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Contents

- Preparation Meetings 1 & 2
- Tram Chim
- Fish farms in Delta
- Chau Doc to Phnom Penh
- Prek Toal
- Kampomg Kleang

Detail in Progress Report 1: Focus area and indicator
selection

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Itinerary



- 19-20th March 2015: Preparation Meeting Part 1
- 21st March 2015: Travel to Ho Chi Min City
- 22-23rd March 2015: Field Trip – Mekong Delta
- 24th March 2015: Travel up river to Phnom Penh
- 25-26th March 2015: Tonle Sap Great Lake
- 27-28th March 2015: Preparation Meeting Part 2

- 4 days workshops
- 2 days travel
- 4 days field visits

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Preparation Meeting Part 1 (OCV)



- Introduction to Council Study and BioRA
- Summary of BioRA process
- Demonstration and trial of BioRA DSS
- LMB background and issues
- Indicator selection workshop
- Focus area selection workshop

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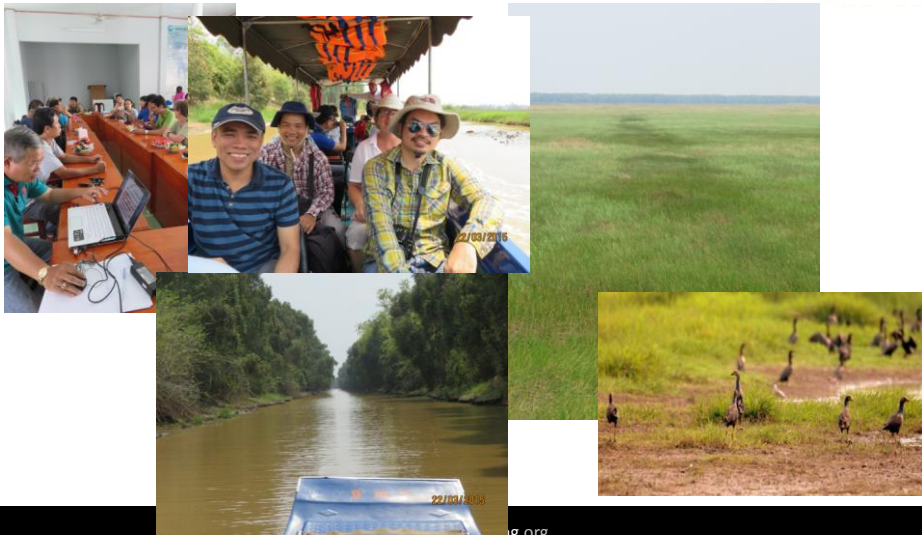
Preparation Meeting Part 2 (Siem Reap)



- Field trip wrap-up and way forward
- Complete focus site selection process
- Site descriptions and reasons for indicators
- Initiate status and trends process
- Next steps

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Mekong Delta: Tram Chim National Park



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“Visiting the biological hot spots such as such as Tram Chim and Prek Toal, provided examples of the existing linkages between hydrology, sediment and nutrient input and how changes to hydrology or sediment and nutrient input may alter these already sensitive environments”

“Observing some of the endangered species in the river, such as the Asian openbilled storks in Tram Chim and eagles in Prek Toal, provided an insight into the natural characteristics of the lower Mekong ecosystem. Comparing these sites with the cleared and developed areas of the delta and Tonle Sap demonstrated how modified the environment is, even though the hydrology has only recently been altered”.

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Mekong Delta: Fish farms in Chau Thanh & Long Xuyen



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“In observing the treatment of rice fields during the dry season across Viet Nam’s delta region -- i.e., the removal all rice stems and leaves after harvests to serve as fodder, and then following through with a thorough burning of vegetative residues -- it becomes apparent just how little agricultural lands contribute to the river system in terms of biomass and fertility during floods. It is noteworthy that these practices probably apply to > 95% of the modern delta, which was historically a mosaic of flooded forests and marshlands”.

*“The fish farms cultured a single species, *Pangasianodon hypophthalmus*. They feed fish with conventional pellet food for catfishes. They use some chemicals for reducing ammonia in the pond water. They use fish farming technique following ‘good practise’ promoted by Viet Nameese government.”*

“According to the owner of the fish farm, some water snakes were occasionally found in the patch and sometime a cobra was also found in a hole along the dyke. The area is quite developed and may support a few water-dependent amphibians and riparian reptiles.”



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Boat trip: Chau Doc to Phnom Penh



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“The turbidity levels in the canals in the delta were much higher than those present in the mainstream Mekong or Bassac on the same days. This demonstrated that the canals generate additional suspended sediment in the system, which needs to be considered within the context of DRIFT.”

“Main vegetation types along Mekong River from Tan Chau to Phnom Penh are agricultural land including corn, chili and paddy field. Some islands/islets covered by grasses or one crop vegetation occur in the mainstem. Sand mining was observed in many places that can change flows or flow direction, lead to bank erosion.”

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Tonle Sap Lake: Prek Toal Biosphere Reserve



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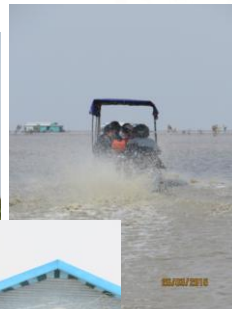
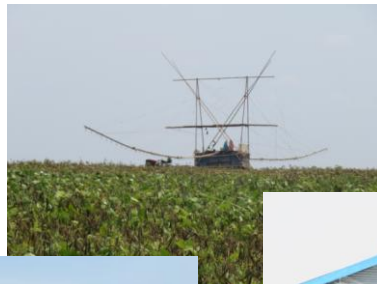


“As we travelled along the channel there was an increase in the numbers and diversity of wetland bird species. The banks were fringed with a ‘scrub forest’, which appeared impenetrable, with stands of Melaleuca forest, some of which had clearly been used as waterbird roosts for considerable lengths of time. In areas this vegetation gave way to tracts of open swampy grassland (in one of these a ‘lek’ of c. 100 purple swamp hen was observed). The number of herons, egrets, cormorants and pelicans increased, with grey and purple heron feeding along the channel edge, which in places was confined, and flocks of tens of spot-billed pelicans feeding in the river itself. Tens of birds were perched atop the Meleleuca trees and these included spot-billed pelicans, night herons, lesser and greater adjutant storks, common darters, and several grey-headed fish-eagles, which were perched on an overhanging tree branch above the main channel.”

“Large populations of fish and large aquatic fowl flourish in a vegetation that retains its original structure and species composition.”

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Tonle Sap Lake: Kompung Kleang



mekong.d

"The two sites (Prek Toal and Kompomg Kleang) on Tonle Sap Lake provide contrastive perspectives on the roles and fate of Cambodia's critical floodplain."



"Of some concern was the large area near Kompomg Kleang cleared and now planted with mung beans with apparent extensive use of insecticides. But also of interest was the cultivation of water lillies as a crop on the flood plain and extensive harvesting of aquatic insects (presumably dytiscid beetles and giant water bugs) as a cash crop for human food."



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In conclusion ...



"Of particular value was to see the intensity of fishing on the lake and the scale of operation and diversity of gears as well as the nature reserve and diversity of bird and plant life. In addition it was interesting to see the expansion of the millet production and destruction of the flooded forest in recent years."

"The field trips were a little fragmented in that we were split between minibuses and boats and there was not always the opportunity to talk to the national experts in other fields of expertise. The national experts in fisheries were well informed and provided good insights into the problems but I am not sure this was transferred fully to the other experts."

"Overall it was an excellent opportunity to gain local knowledge from the riparian participants, and to put the local examples in a global perspective"

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The RTWG is specifically requested to:



- Take note of the progress with Preparation Meetings and Field Trip I
- Keep in mind in upcoming presentations on indicators, focus areas, and status and trends assessment

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