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For sustainable development




BioRA DSS Workshop

Use of the Status and Trends Assessments

BioRA DSS Technical Workshop
Phnom Penh, Cambodia
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OBJECTIVES OF THE S&T ASSESSMENTS

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The need for S&T assessment

- BioRA needed to:
 - Contextualise the expected changes as a result of WR developments
 - describe the present ecological status of the LMB aquatic ecosystems;
 - describe the past ecological status of the LMB aquatic ecosystems, and possibly;
 - describe the future ecological status of the LMB aquatic ecosystems with and without the water resource developments included in the scenarios.

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Thus the S&T assessments:

- identify and document past and current pressures on the system;
- establish the historical context of LMB aquatic ecosystem
- develop understanding of how the ecosystem has responded to past pressures
- ensure that all disciplines are working within a common understanding of past and present pressures on the system

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NATURE OF THE S&T ASSESSMENTS

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What are S&T assessments?



For each indicator

- estimate of how different the abundance/area/concentration of each indicator was (if at all) relative to the present:
 - in 1900
 - in 1950
 - in 1970
 - in 2000
- identify the main drivers of change

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Process



- For each indicator:
 - define current ecological status
 - identify main impacts
 - estimate past changes. As a relative percentage of 2015 (100%) in:
 - 1900;
 - 1950;
 - 1970;
 - 2000.

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Geographical Units used



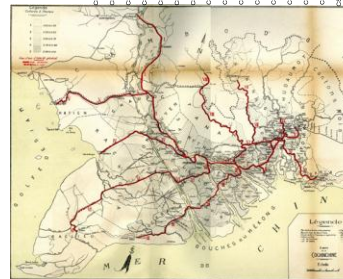
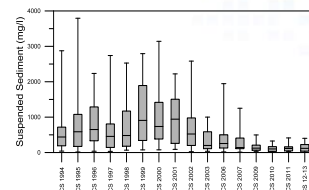
S&T area		BioRA zones	
1	Mekong River in Laos PDR	1	Mekong River from the border with China to upstream of the confluence with the Nam Ngene
2	Mekong River in Laos PDR/Thailand	2	Mekong River from downstream of the Nam Ngene to upstream of the confluence with the Huai Mong
		3	Mekong River from downstream of the Huai Mong to the Laos PDR/ Cambodian border
3	Mekong River in Cambodia	4	Mekong River from the Laos PDR/Cambodian border to upstream of the confluence with the Prek Chhlong
		5	Chaktomuk area
4	Tonle Sap River	6	Tonle Sap River from Phnom Penh to the Tonle Sap Lake
5	Tonle Sap Great Lake	7	Tonle Sap Great Lake
6	Mekong Delta	8	Mekong Delta from the Cambodian/Viet Nam border to sea

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Information used



- Maps
- Historic texts
- Scientific monitoring/reviews
- Population statistics
- MRC monitoring data
- Google
- Aerial photographs
- Expert opinion
- Discussion and consensus





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OVERVIEW OF RESULTS

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Main impacts identified

- habitat loss (rice and other production)
- harvesting pressures (fishing/hunting)
- changes in flow and sediment supply (dams, plus sand-mining, rubber plantations and deforestation)
- changes in connectivity (migration routes)
- Other impacts:
 - massive defoliation in American War
 - changes in utilisation pressures (such as cancellation of fish lots in Cambodia)

Chronology of main impacts

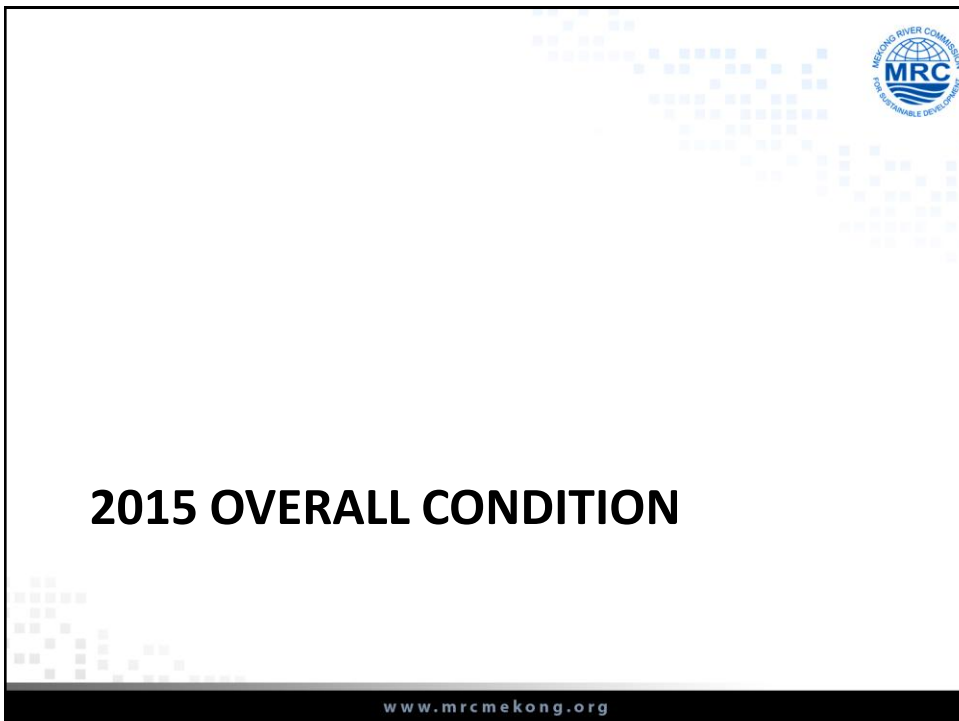
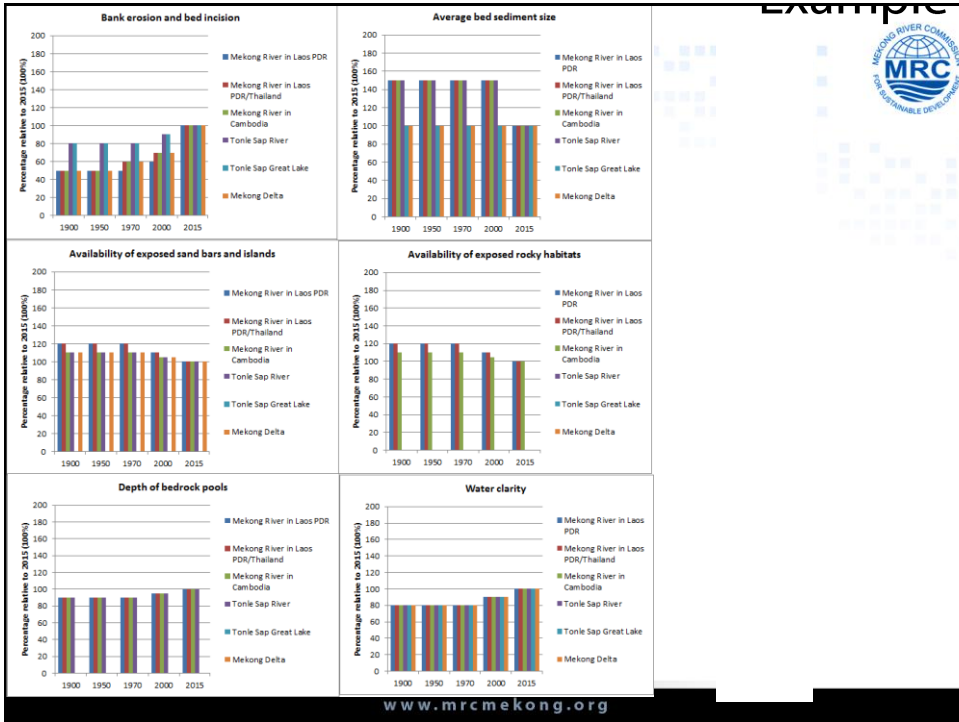



Date	Actions/developments	Consequences for LMB ecosystem
1800-	Expansion of rice and other production	Conversion of wetlands, and increasing control of flooding and salinity regimes
1800-	Sand mining	Changes to sediment budgets/habitats
1939-1979	Conflicts	Removal/poisoning/burning/killing of fauna and flora.
1950-	Expansion of rubber plantations and deforestation	Changes in sediment regimes
1966 -	Dams in tributaries	Changes in flow and sediment regimes.
1992 -	Lancang Cascade HPPs	Loss of connectivity
-	Other policies	Pressure on resources
-	Harvesting pressures	Increase with population increases/advances in tools

2008 condition - summary




- Most change in Delta
- Least change in upper reaches of LMB
- Most change in riparian and floodplain vegetation, birds and mammals
- Least change in instream habitats





A	Unmodified, natural	As close as possible to natural conditions.
B	Largely natural	Modified from the original natural condition but not sufficiently to have produced measurable change in the nature and functioning of the ecosystem/community.
C	Moderately modified	Changed from the original condition sufficiently to have measurably altered the nature and functioning of the ecosystem/community, although the difference may not be obvious to a casual observer.
D	Largely modified	Sufficiently altered from the original natural condition for obvious impacts on the nature and functioning of the ecosystem/community to have occurred.
E	Completely modified	Important aspects of the original nature and functioning of the ecosystem community are no longer present. The area is heavily negatively impacted by human interventions.

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Area	Erosion	Average bed sediment size	Availability of exposed sand bars and islands	Availability of exposed rocky habitats	Depth of bedrock pools	Water clarity
	2015	2015	2015	2015	2015	2015
Mekong River in Laos PDR	D	B	C	C	B	B
Mekong River in Laos PDR/ Thailand	D	B	C	C	B	B
Mekong River in Cambodia	D	B	B	B	B	B
Tonle Sap River	C	B	B	NA	B	B
Tonle Sap Great Lake	C	B	NA	NA	NA	B
Mekong Delta	D	B	B	NA	B	B

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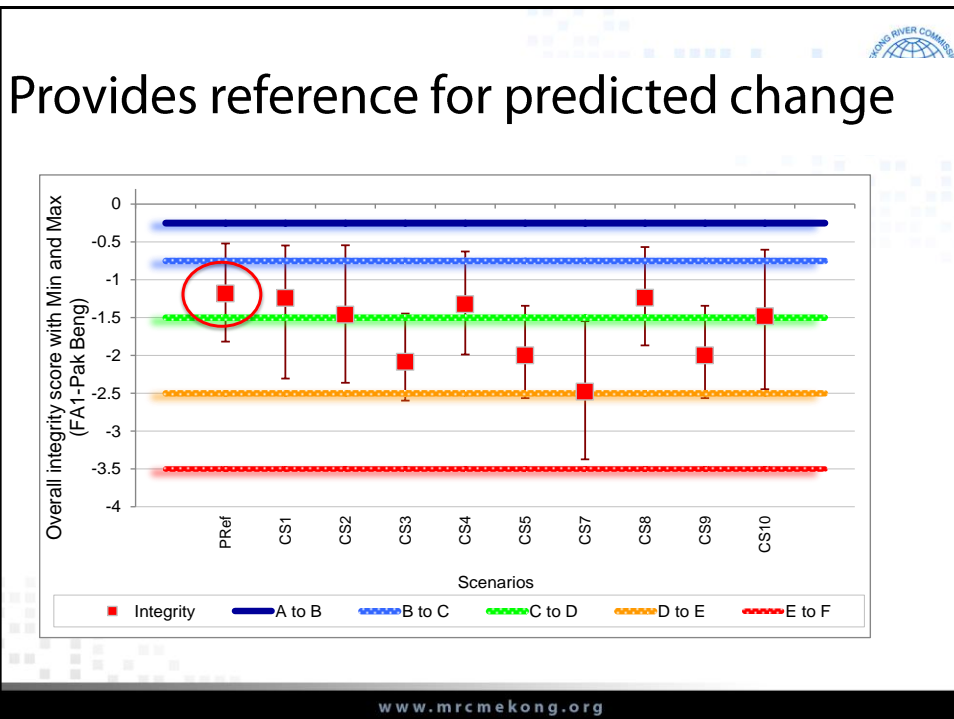
Entered into DSS

2. KNOWLEDGE CAPTURE

Integrity / Present Ecological Status

Discipline	FA1-Pak Beng	FA2-Vientiane	FA3-Se Bang Fai	FA4-Stung Treng	FA5-Kampong Cham	FA6-Tonle Sap River	FA7-Tonle Sap Lake
Oecology	C	C	B/C	B/C	B/C	B/C	
Vegetation	C	C	C/D	C	C	E	D/E
Macro-invertebrates	B/C	B/C	B/C	B/C	B/C	C	C
Fish	C/D	C/D	C/D	B/C	B/C	B/C	B/C
Herpetofauna	C	C	C	C/D	C/D	C/D	C/D
Birds	D	D/E	D	D	D	D	D
Mammals		E		E			E

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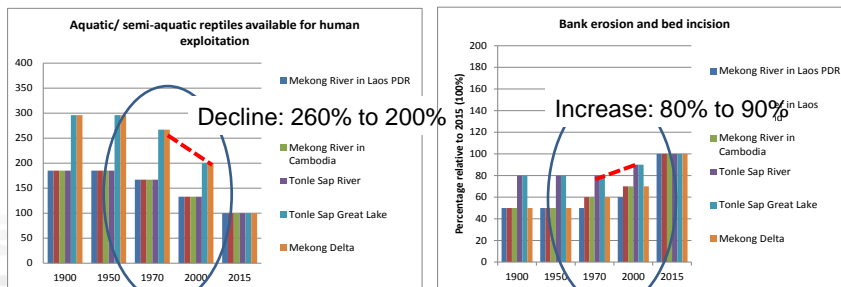
EXOGENOUS BASELINES

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Values for exogenous baseline

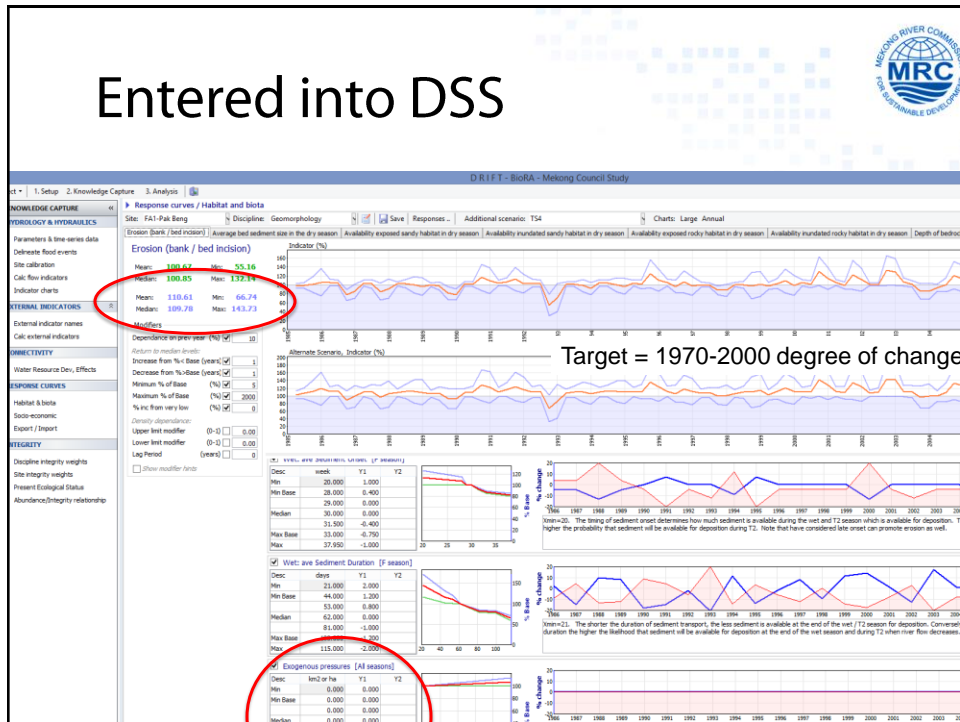


- 1970-2000
- Combined exogenous effects



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Exogenous scenario (TS4)

- Reference hydrology:
- Exogenous factors, excluding WR development after 2008, 'switched on'
- Triggers Response Curves in DSS
- S&T results are basis for exogenous scenario:
 - S&T Assessment detailed in Specialists' Report

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Thank You



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