22nd International RIVER SYMPOSIUM
EXCELLENCE – COLLABORATION – INTEGRATION

INTERNATIONAL RiverFoundation

Collaboration

Connection

River Flows

São Francisco River, Cabrocó, Brazil

Garonne River, Toulouse, France

France, China, Brazil and Australia: Stakeholders and River Basin Governance

Learning

Renewal

Species Reproduction

Yellow River, Jinan, China

Institutions

Composition

Biodiversity

Darling River, Bourke, Australia

Frederick Bouckaert
School of Earth and Environmental Sciences,
University of Queensland

Leadership

Direction

Water Quality

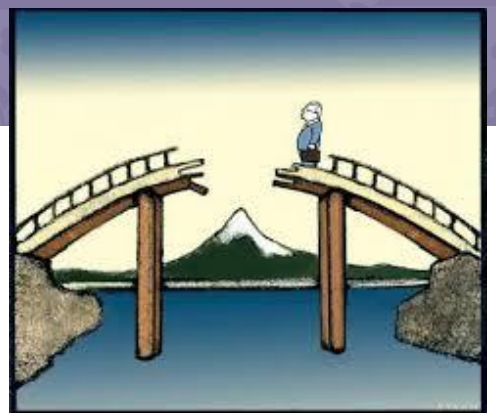
Brisbane, Australia | 20-24 October 2019

THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

Presentation outline

1. Knowledge gaps
2. Aims of the research project
3. Conceptual framework
4. Data collection
5. Results
6. Implications
7. Summary and conclusions

Knowledge gaps



1. Artificial divide between natural and policy processes
2. Command-and-control mind frame of humans separate from nature is problematic
3. Co-evolutionary processes are largely missing
4. The function of an RBO with regard to its agency in the co-evolved system as seen by key basin stakeholders.

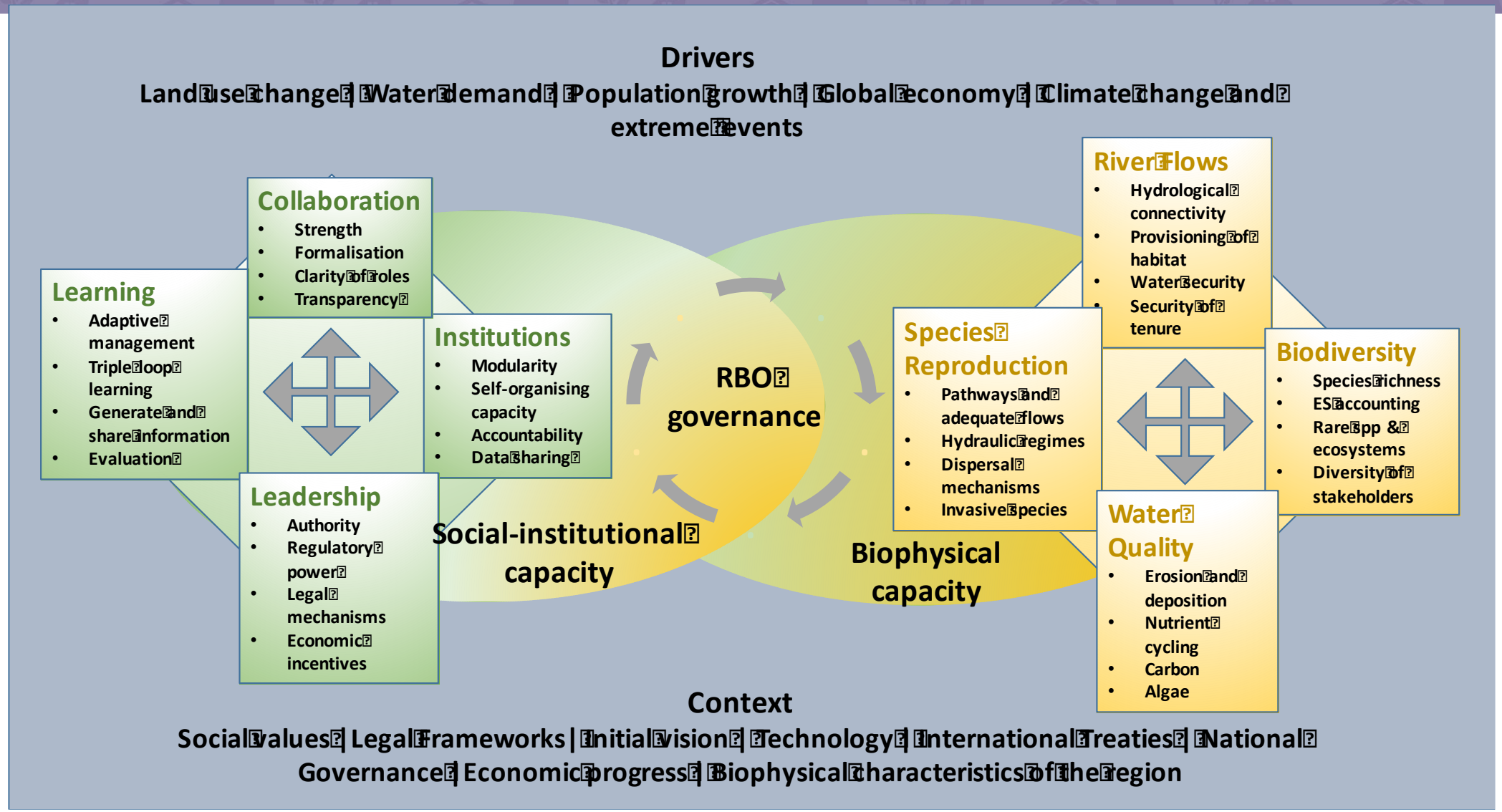
Aims of the research project

- Explore the role of RBO in river basin governance in engaging with stakeholders.
- Examine the role of functional system indicators, in relation to end-point measurement targets.
- Using indicators with functional similarities to integrate social and biophysical system components.

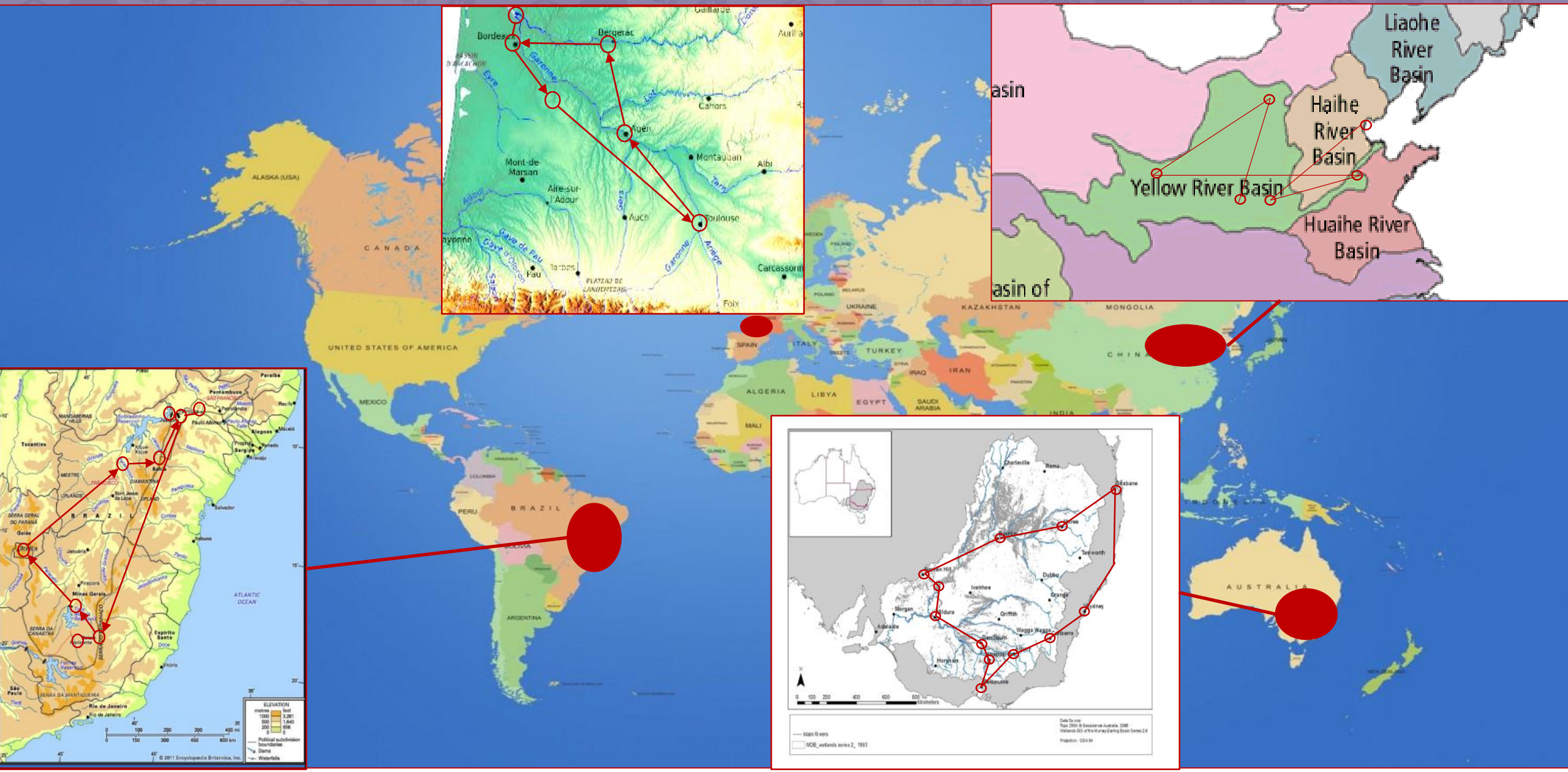
How?

1. Develop a diagnostic, functional framework consisting of key governance and management indicators.
2. Test the validity and usability of the framework by applying it in a number of basin case studies.

Conceptual framework



Data collection



Data collection: which stakeholders were interviewed?

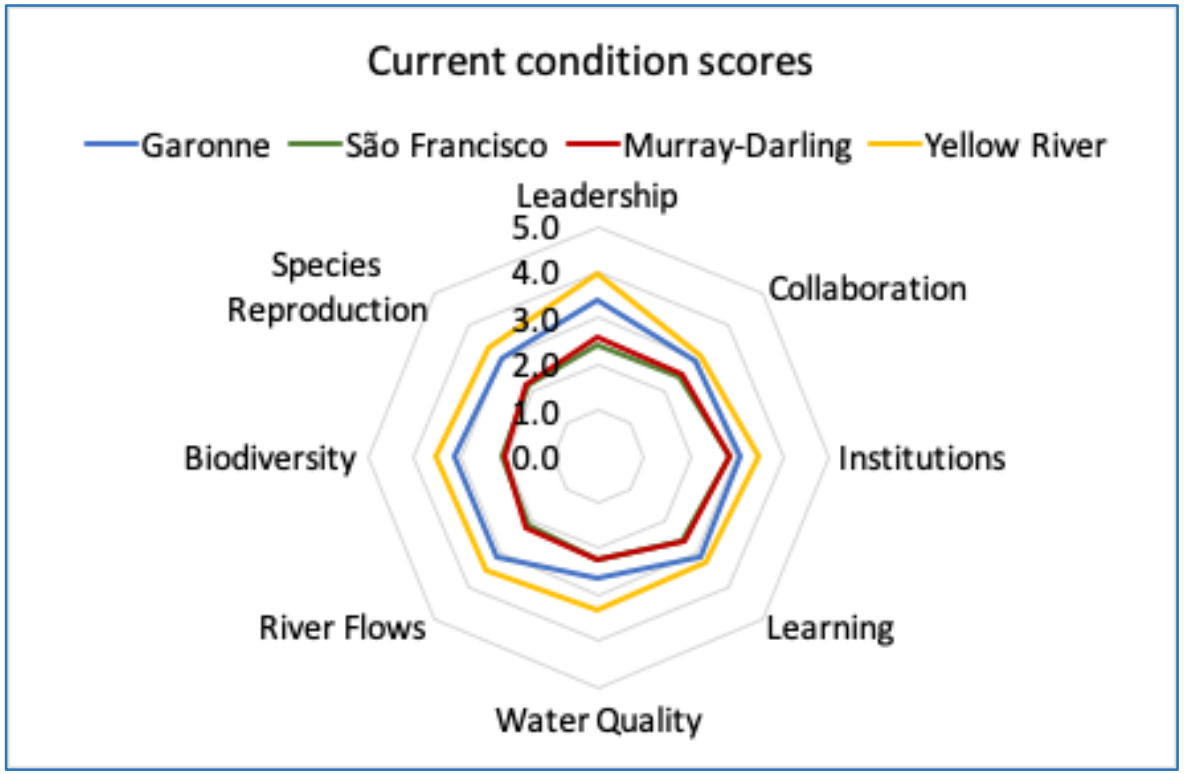
Stakeholder category	São Francisco, Brazil	Garonne, France	Yellow River, China	Murray-Darling, Australia
RBO staff	4	9*	1	7
Decision makers	3	4	4	3
RBO subsidiary	2	5	9*	4
Community member ES	2	1	6	0
NGO	4	4	2	5
Livelihood dependent	1	1	2	0
Scientist	5	2	4	8
Hydropower/water supply	3	2	3	1
Irrigation	4	2	0	3
General public	4	0	0	0
Total	**32**	**21**	**31**	**31**

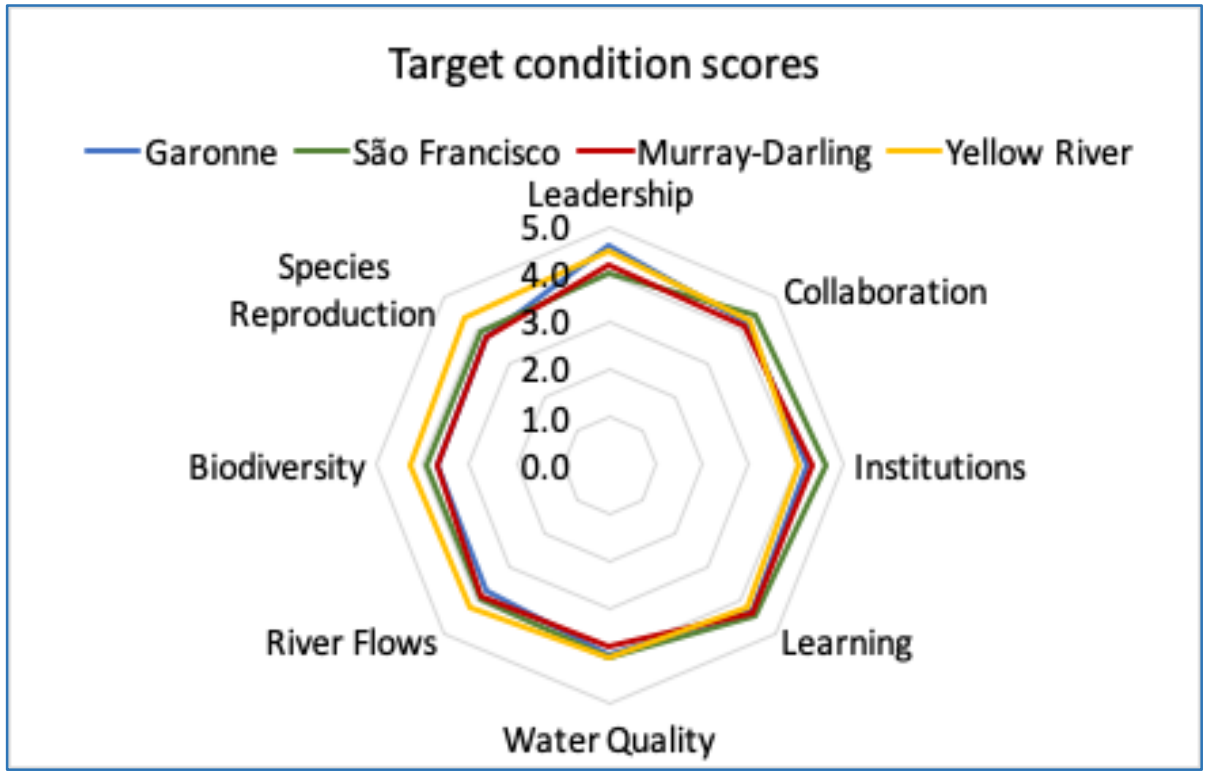
- Stakeholders from Upper, Middle and Lower parts of each of the Basins, to get a geographic perspective on basin management, equity and priorities
- Ten stakeholder categories, but some are overlapping (some participants ticked multiple boxes)
- In this analysis no breakdown by category detail attempted; average scores and key issues distilled only.

Data collection: what were the stakeholders asked?

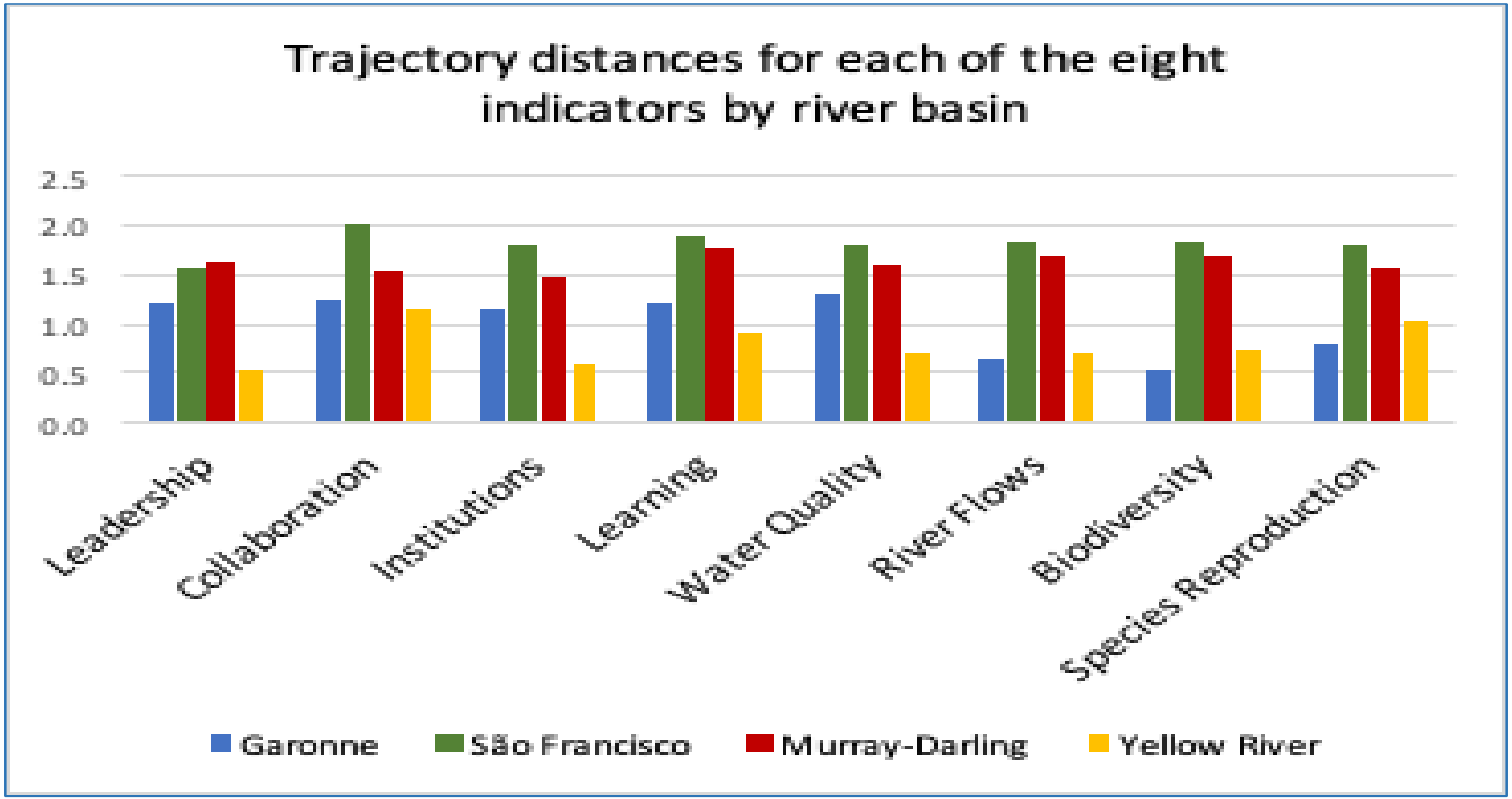
1. Please provide a **score** for for current capacity and target capacity, using an explanatory rubric describing score conditions for each indicator from:
   - very poor (1), to poor (2), to moderate (3), to good (4) to very good (5)
   - For eight key indicators: Collaboration, Leadership, Institutions, Learning, River Flows, Water Quality, Biodiversity, Species Reproduction.
2. When an indicator makes progress in reaching target scores, what is the **influence of this indicator** on all others in achieving their target scores, using the following scale: counteracting (-2), constraining (-1), neutral (0), enabling (+1), reinforcing (+2): this results in an influence matrix.
3. **Stakeholder profile** scoring questions: vision alignment, personal influence, organisational influence: 1 very weak, 2 weak, 3 moderate, 4 strong, 5 very strong
4. **Open ended questions** on vision, contemporary threats, governance arrangements over time, spatial challenges, perspective on integration across social/cultural, environmental, economic and political dimensions, **key challenges.**

Results: current and target scores





Results: trajectory distance (target – current)



Results: Average indicator influence matrices

- In Yellow River and Garonne River more counteracting influences from biophysical to governance indicators than in Murray-Darling River and São Francisco River
- In Yellow River Leadership reinforces material cycling; in Murray-Darling Learning reinforces Water flows and Species recruitment.
- In São Francisco and Adour-Garonne only enabling links from governance to biophysical influences

Murray-Darling	L	C	I	Ln	WQ	RF	B	SR
Leadership		1.23	1.10	1.08	0.85	1.15	0.82	0.82
Collaboration	0.87		1.05	1.53	0.92	1.15	0.92	0.89
Institutions	1.03	1.35		1.00	0.61	0.84	0.61	0.65
Learning	0.97	1.29	0.87		1.19	1.26	1.19	1.23
Water Quality	0.42	0.68	0.29	0.77		0.90	1.23	1.32
River Flow	0.48	0.79	0.31	0.87	1.35		1.34	1.42
Biodiversity	0.35	0.63	0.29	0.84	0.71	0.55		1.19
Species Reproduction	0.35	0.69	0.29	0.79	0.85	0.61	1.39	

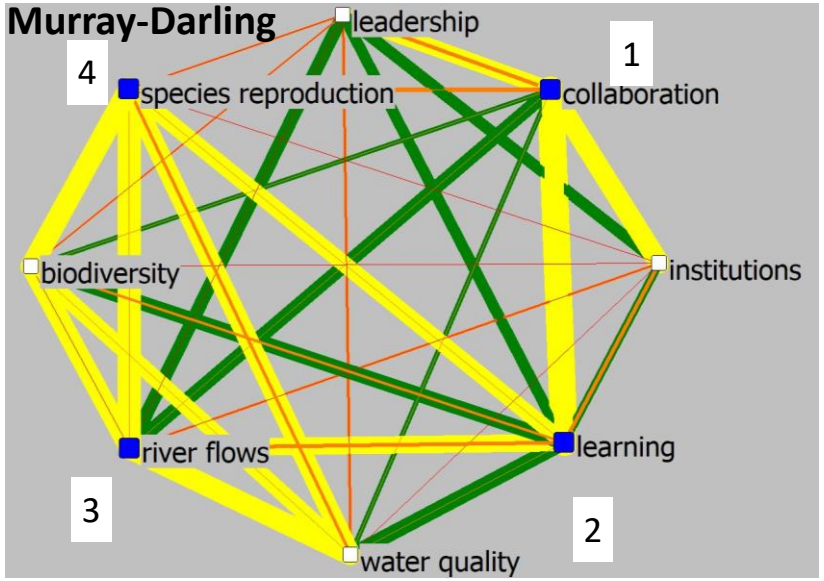
Yellow River	L	C	I	Ln	WQ	RF	B	SR
Leadership		1.26	1.37	1.30	1.70	0.87	0.89	0.89
Collaboration	0.63		0.93	1.15	1.11	1.04	0.93	1.00
Institutions	0.63	1.19		1.11	0.85	0.85	0.85	0.78
Learning	0.96	1.19	1.04		0.96	0.89	0.96	0.96
Water Quality	0.37	0.48	0.48	0.67		0.87	0.98	1.06
River Flow	0.40	0.51	0.44	0.58	1.17		1.20	1.20
Biodiversity	0.40	0.44	0.40	0.58	0.83	0.65		1.24
Species Reproduction	0.29	0.40	0.40	0.58	0.87	0.83	1.20	

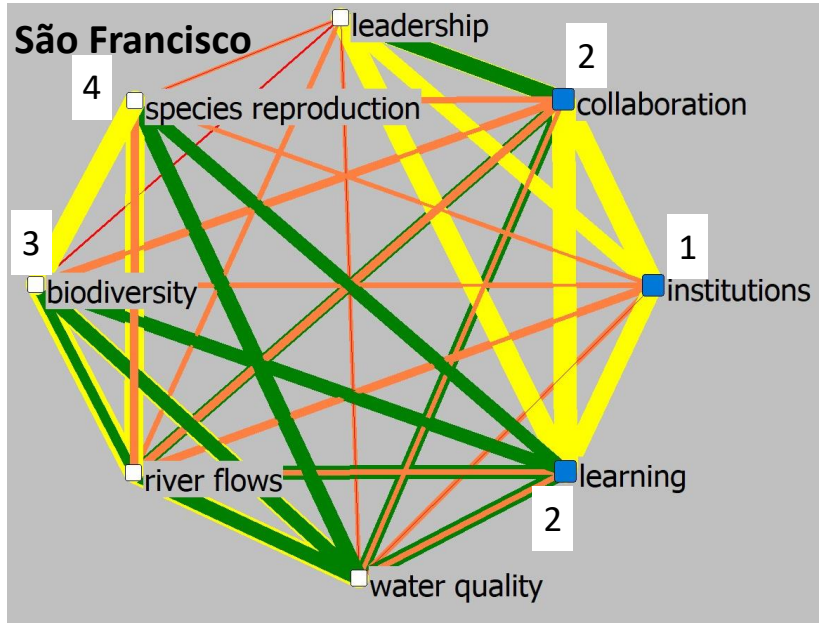
São Francisco	L	C	I	Ln	WQ	RF	B	SR
Leadership		1.5	1.36	1.18	0.8	0.86	0.6	0.7
Collaboration	1.4		1.68	1.7	1.2	1.16	1	0.9
Institutions	1.4	1.6		1.5	0.8	0.96	0.8	0.8
Learning	1.6	1.8	1.48		1.3	1.26	1.3	1.2
Water Quality	0.3	0.8	0.52	0.84		1.58	1.5	1.4
River Flow	0.7	0.9	0.74	0.82	1.3		1.6	1.5
Biodiversity	0.5	0.8	0.68	1.04	1.3	1.04		1.6
Species Reproduction	0.5	0.9	0.68	1.12	1.2	0.98	1.6	

Adour-Garonne	L	C	I	Ln	WQ	RF	B	SR
Leadership		1.25	0.70	0.95	0.85	0.95	0.70	0.70
Collaboration	1.30		1.20	1.25	0.95	0.95	0.75	0.75
Institutions	1.20	1.33		0.95	0.75	0.80	0.70	0.70
Learning	0.90	1.40	1.15		1.03	1.08	1.13	1.13
Water Quality	0.25	0.40	0.25	0.60		0.83	1.38	1.33
River Flow	0.25	0.45	0.40	0.50	1.58		1.70	1.60
Biodiversity	0.15	0.15	0.25	0.60	0.65	0.35		1.40
Species Reproduction	0.05	0.10	0.20	0.65	0.78	0.48	1.40	

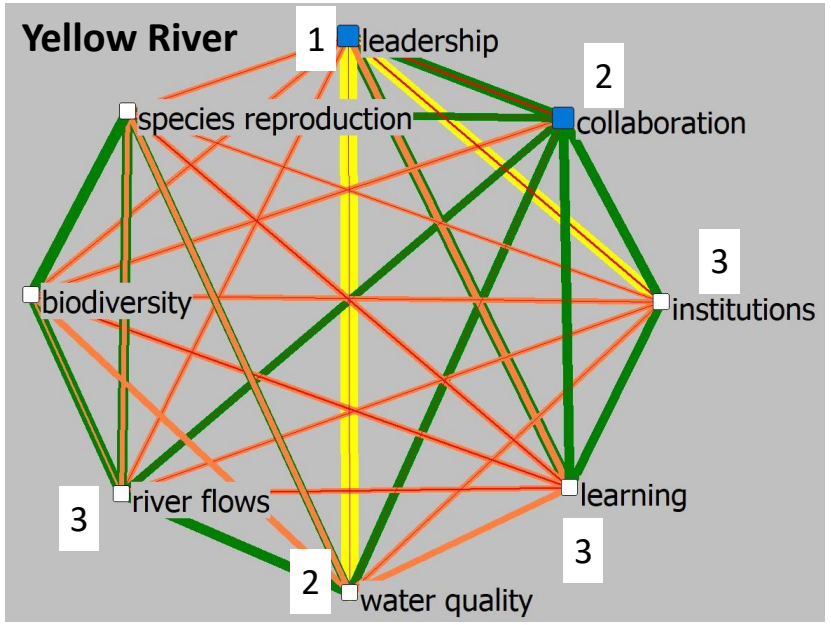
Legend: red = counteracting, amber = constraining, green = enabling, yellow = reinforcing

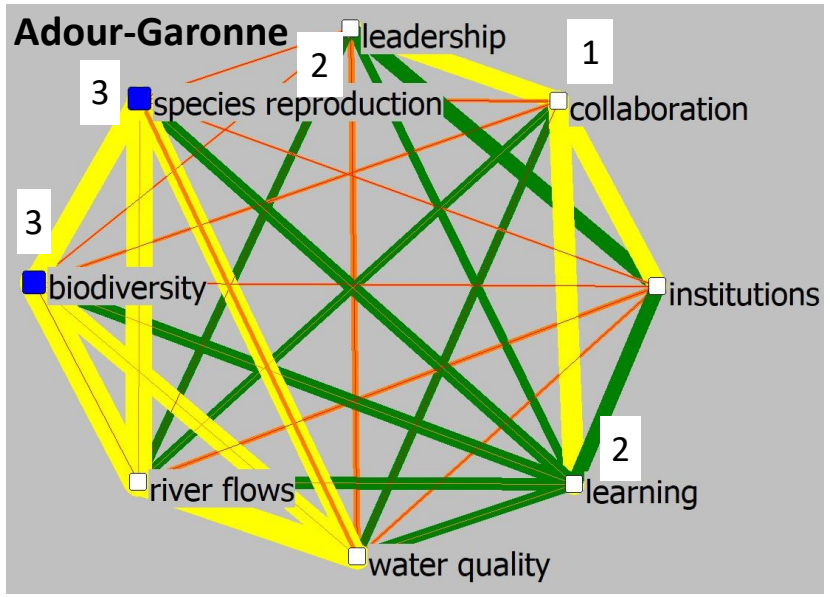
Results: Synergy pathways based on network analysis





- Using indicator core node position and strength of influence
- Determine 'investment' pathway to optimise synergistic effects of indicator influences (reinforcing and enabling)
- Cognitive check against basin management plans and core challenges raised by stakeholders





Implications: Challenges from stakeholder interviews

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indicator	Murray-Darling	Yellow River	São Francisco	Garonne
Leadership	Subsidiarity and stronger Basin strategy	[1] -	RBO decision making power on implementing basin plan	[2] **Lack of vision**
Collaboration	[1] **Stakeholder engagement, building trust and transparency**	[2] **Data sharing, consultation with stakeholders (local economic impacts)**	[2] **Engagement with stakeholders, education, representation**	[1] **Equal representation of all interest groups, coordinate top down bottom up**
Institutions	Structural reform to separate MDBA role of coordination, river operation and regulator	[3] **Integrating basin and local level management is needed; monitoring and regulation**	[1] **Integration of RBO with federal, state and municipal government policies**	[2] Elect members based on water expertise; greater transparency, integrate with regional gvts and councils
Learning	[2] -	[3] -	[2] Adaptive management	[2] -
Water Quality	-	[2] **Water quality, pollution**	-	-
River Flows	[3] **More efficient use, ecological flow requirements**	[3] Flood control, water allocation to meet demand	Water Pact, formalising water allocations	Need sustainable flow management
Biodiversity	-	Protecting wetlands	[3] **River restoration**	[3] Ecological restoration needs to be centre stage
Species Reproduction	[4] -	-	[4] -	[3] -

Governance models and stakeholder engagement

French/ Brazilian model	Australian Model	Chinese model
Stakeholder groups in the Basin Committee are legally elected representatives from civil, public and private life.	Legislative requirement to consult with state jurisdictions, but not directly with stakeholder groups (Basin Consultative Committee)	Top down planned economy. YRCC responsible for water allocation (based on submissions from states and irrigators), and flow management (flood protection, sediment management, pollution)
Basin Committee is advisory, needs an independent Agency to implement decisions.	MDBA implements, consultation with stakeholders is discretionary	YRCC has no enforcement powers, needs to rely on Ministries (National and Provincial)
All groups are being heard, but consensus model has poor performance (decision paralysis).	Continued justification is required; poor stakeholder engagement.	Poor coordination with local government. River and Lake Chief system being introduced.
Technical top-down bias still dominates, but accountability to elected stakeholders exists. Not all groups are represented.	Technical top down bias still exists, accountability is based on best available science and evidence based evaluations	Technical and bureaucratic, embedded in national water policy 5 year plans (YRCC has offices in upper, middle and lower YR)
Strong informal lobby groups and political interests.	Strong informal lobby groups and political interests.	Local industries able to ignore water quality regulations

Summary and conclusions

1. This diagnostic framework provides strategic guidance on key challenges and perceived indicator synergies which do not always reflect priority objectives of basin management plans.
2. Identified challenges most frequently mentioned align with the first steps of proposed pathway, but some connecting steps are unrelated to challenges
3. First steps of influence pathways correspond with large trajectory distances of current to target for relevant indicators.
4. This set of tools provides:
   - a more nuanced way of prioritising pathways to implement river basin plans
   - a framework that allows greater stakeholder input
   - identification of commonalities between river basin governance challenges
5. The implication from this work is that implementing basin plans may need to invest first in governance objectives rather than management and restoration.

Thank you

I would like to acknowledge my advisory panel Associate Professor YongPing Wei (UQ), Professor Karen Hussey (UQ) and Associate Professor Jamie Pittock (ANU).

This research is made possible by an APA Scholarship and Global Change Scholarship.