Water governance in Brazil

The need to share water in the anthropocene

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ANNEX A. SEARCH TERMS

Keywords searched in scientific databases

#1 water governance
TS=((“water” OR “river*” OR “basin*”) AND (“governance” OR “conflict*” OR “management*”))

#2 transboundary
TS=(“transbound*”)

#3 national
TS=(“federal*” OR “domestic*” OR “national*” OR “internal*” OR “state*” OR “Argentina*” OR “Australia*” OR “Austria*” OR “Belgium*” OR “Bosnia and Herzegovin*” OR “Brazil*” OR “Canad*” OR “Comoros*” OR “Emirates” OR “Ethiopia*” OR “German*” OR “India*” OR “Iraq*” OR “Kitts and Nevis” OR “Malaysia*” OR “Mexic*” OR “Nepal*” OR “Nigeria*” OR “Pakistan*” OR “Russia*” OR “sov*et union” OR “USSR” OR “South of Sudan” OR “south sudan” OR “Switserland” OR “Swiss” OR “United States” OR “USA” OR “Venezuela*” OR “Somali*”)

#4 sustainable and inclusive development
TS=(“sustainable development” OR “inclusive development”)

#5 instrument
TS=(“instrument*” OR “policies” OR “policy” OR “adaptive*” OR “indicator*”)

#6 river governance
TS=((“river*” OR “basin*”) AND (“governance” OR “conflict*” OR “management*”))

Set A = 1 AND 2 AND 3 681 results
Set B = 4 AND 5 AND 6 444 results

ANNEX B. SUMMARY OF TERMS AND DEFINITIONS

Terms	Definitions
Water governance	The concept of water governance is still being defined and refined, most of the time related to the field of interest. I use the definition "the political, social, economic and administrative systems in place that influence water use and management. Essentially, who gets what water, when and how, and who has the right to water and related services, and their benefits? It determines the equity and efficiency in water resource and services allocation and distribution, and balances water use between socio-economic activities and ecosystems" (UNDP, SIWI,2016).
Drought	Drought has a complex definition because their definition differs across climatic regions, scientific disciplines, and sectors (*UNDRR, 2021*). Normally, it is defined taking into account the long-term average climate of a specific region (*Heim Jr, 2002; Dai, 2013*). The Intergovernmental Panel on Climate Change (IPCC) defines drought as "a period of abnormally dry weather long enough to cause a serious hydrological imbalance" (IPCC, 2012), when apply for this thesis
Ecological flow	Ecological flow "corresponds to the amount of water that must remain in the watercourse in order to maintain the activities of the aquatic and riparian organisms. In order to determine this, besides the studies of the hydrological conditions of the basin, the analysis of the response of the aquatic species to the changes of hydrological factors should be done. The understanding of the interrelation biota-flow is essential for determining the ideal flows to support river ecosystems" (*da Silva, Pereira and de Oliveira Vieira, 2020, p. 19*)

ANNEX C. FEDERAL STATES AND WATER PROBLEMS/ WATER-SHARING

Country	Water-sharing problems in these basins	Reference
Argentina	Between users	*(Moreyra and Wegerich, 2006; Moreyra and Warner, 2007)*
Australia	Between humans and nature	*(Leblanc et al., 2012)*
Austria	Between uses and users concerning water-related risks	*(Collins et al., 2016)*
Belgium	Between uses (water quality) - international river	*(Warner, 2016)*
Brazil	Between humans and nature and users	Chapter 6
Bosnia and Herzegovina	Between uses (lack of drinking water)	*(Vukmir, Lj and Cero, 2009)*
Canada	Between states	*(Cohen et al., 2006)*
Comoros	Between uses (lack of drinking water)	*(Beauchamp, 2017)*
Emirates	Between uses (lack of drinking water)	*(Shahin and Salem, 2015)*
Ethiopia	Between other countries part of the same river basin	*(BBC, 2018)*
Germany	Between uses (water quality)	*(Förstner et al., 2016)*
Kitts and Nevis	Between uses (water quality)	*(Brewster and Mwansa, 2001; World News, 2017)*
India	Between states	*(Sharma, Hipel and Schweizer, 2020)*
Iraq	Between uses (water quality)	*(Zolnikov, 2013; Issa et al., 2014; Abd El Mooty, Kansoh and Abdulhadi, 2016)*
Malaysia	Between uses (water quality)	*(Afroz et al., 2014)*
Mexico	Between uses and humans and nature	*(Castro, 2005; van den Brandeler, 2020)*
Nepal	Between other countries part of the same river basin	*(Condon and Lang, 2009; Siddiqui, 2017)*
Nigeria	Between users	*(King and Spangler, 2017)*
Russia	Between regions	*(OOSKAnews, 2018)*
Switzerland	Between uses	*(Brunner et al., 2019)*
South of Sudan	Between other countries part of the same river basin	*(Salman, 2011; Baratta et al., 2021)*
Pakistan	Between states/countries	*(Sayama et al., 2012; Hayat, 2020)*
United States	Between uses	*(Craig, Feng and Gilbertz, 2019; Mueller and Gasteyer, 2021)*
Venezuela	Between uses	*(Buxton, 2016)*

ANNEX D. INTERVIEW LIST

Code	Level	State	City	Sector	
N-1	National	PE	Recife	Public Sector	
N-2	National	PE	Recife	Public Sector	
N-3	National	PE	Recife	Public Sector	
N-4	National	PE	Recife	TBD	
N-5	National	MG	Lavras	NGOS/Civil	
N-6	National	MG	São Roque de Minas	Public Sector	
N-7	National	BA	Petrolina	TBD	
N-8	National	MG	Belo Horizonte	Public Sector	
N-9	National	BA	Juazeiro	NGOS/Civil	
N-10	National	SP	São Paulo	Private Sector	
N-11	National	MG	Lavras	Private Sector	
N-12	National	BA	Juazeiro	Private Sector	
N -13	National	DF	Brasília	Public Sector	
N-14	National	DF	Brasília	TBD	
N-15	National	DF	Brasília	Private Sector	
N-16	National	DF	Brasília	Public Sector	
N-17	National	MG	Delft	Public Sector	
N-18	National	MG	Lavras	Public Sector	
N-19	National	BA	Brasília	NGOS/Civil	
N-20	National	PE	Recife	NGOS/Civil	
N-21	National	DF	Brasília	Public Sector	
N-22	National	SP	São Paulo	Public Sector	
N-23	National	AL	Delmiro Gouveia	Public Sector	
N-24	National	PE	Recife	NGOS/Civil	
N -25	National		Delft	NGOS/Civil	
N-26	National	RJ	Rio de Janeiro	NGOS/Civil	

	Organization	Background
	Technische Universität Berlin/Pernambuco Federal University	Socio-Environmental Scientist and professor
	National Energy Operator (ONS)	Senior Hydraulic Engineer/Head of the Organization
	Chesf	Senior Hydraulic engineer
	Chesf	Executive/water management
	MAB	Activist
	ICMBIO	Ecosystem management
	Codevasf	Journalist
	Minas Gerais Federal University	Senior Hydraulic engineer/ Sanitation
	Pastoral da Terra	Activist
	Private Sector	Technician
	Consultancy	Mining Expert
	Interbasin transfer	Forest Engineering - Conservation focus
	ANA	Coordinator of the Hydrology Area
	Codevasf	Senior Agronomy and Adviser
	Confederation of Agriculture and Livestock of Brazil (CAN)	Agronomy
	ANA	Coordinator of Committee Programs
	Federal University of Minas Gerais	Environmental Scientist - Sanitation Focus and Consultant
	Lavras Federal University	Socio-Environmental Scientist
	Ministry of Agrarian Development	Ex-member of Ministry of development (MDS)
	ASA	Journalist
	ANA	Coordinator of the Hydrology Area of the São Francisco River Basin- National Water Agency (ANA)
	ABC Federal University	Socio-Environmental Scientist and professor
	Alagoas Federal University	Soil and Conservation expert/ professor
	ASA	Popular Educator and director of ASA
	Consulting	Brazilian Lawyer and expert on environmental legislation
	Consulting	Brazilian Lawyer and expert on environmental legislation

Code	Level	State	City	Sector	
B-1	Basin	AL	Maceió	NGOS/Civil	
B-2	Basin	BA	Petrolina	Public Sector	
B-3	Basin	PE	Recife	Public Sector	
B-4	Basin	PE	Recife	Public Sector	
B-5	Basin	PE	Recife	TBD	
B-6	Basin	PE	Recife	TBD	
B-7	Basin	AL	Maceió	TBD	
B-8	Basin	AL	Maceió	TBD	
B-9	Basin	AL	Maceió	NGOS/Civil	
B-10	Basin	BA	Paulo Afonso	NGOS/Civil	
B-11	Basin	AL	Paulo Afonso	Public Sector	
MG-1	State	MG	São Roque de Minas	Private Sector	
MG-2	State	MG	Belo Horizonte	TBD	
MG-3	State	MG	Belo Horizonte	TBD	
MG-4	State	MG	Belo Horizonte	Public Sector	
MG-5	State	MG	Belo Horizonte	NGOS/Civil	
MG-6	State	MG	São Roque de Minas	Public Sector	
MG-7	State	MG	Vargem Bonita	Private Sector	
MG-8	State	MG	São Roque de Minas	Public Sector	
MG-9	State	MG	São Roque de Minas	Public Sector	
MG-10	Local	MG	Vargem Bonita	Private Sector	
MG-11	State	MG	São Roque de Minas	Private Sector	
MG-12	State	MG	Vargem Bonita	Private Sector	
BA-1	State	BA	Salvador	Public Sector	
BA-2	State	BA	Salvador	Public Sector	
BA-3	State	BA	Juazeiro	NGOS/Civil	
BA-4	State	BA	Juazeiro	NGOS/Civil	
BA-5	State	BA	Paulo Afonso	Public Sector	

	Organization	Background
		Activist
	Federal University of the São Francisco (UNIVASF)	Socio-Environmental Scientist
	Federal Univerity of Pernambuco (UFPE)	Hydrologist/Professor and member of CBHSF
	Joaquim Nabuco Foundation	Hydrologist and ex-member of CBHSF
	Chesf	Operational/Water Management
	Chesf/ State University of Pernambuco	Hydrogeologist and professor
	CBHSF	Chairman of the CBHSF
	CBHSF	Water Lawyer Expert
	CBHSF	Hydrogeologist expert
	CBHSF	Water Management expert and Vice-chairman of the CBHSF
	ICMBio	Biologist - Conservation focus
	Consultancy - Terra Brazilis	Biologist - Conservation focus
	3 Marias Hydropower/CEMIG	Engineering - Water Management
	COPASA	Hydrologist
	IGAM	Water management expert
	CPT Pastoral da terra	Popular educator
	ICMBio	Technician
	Big Farmer Upstream	Farmer
	ICMBio	Technician
	ICMBio	Technician
	Big Farmer Upstream	Farmer
	Small Farmer Upstream	Farmer
	Small Farmer Upstream	Farmer
	UFBA	Professor of Water Governance
	CEPLAC	Agronomy
	Civil society	
	Juazeiro Museum	Historian
	Secretariat of Environmental and Water (two members) - at Paulo Afonso city – transboundary city with Alagoas, Bahia and Sergipe states	

Code	Level	State	City	Sector	
BA-6	State	BA	Paulo Afonso	Public Sector	
BA-7	State	BA	Paulo Afonso	NGOS/Civil	
BA-8	State	BA	Paulo Afonso	NGOS/Civil	
BA-9	State	BA	Petrolina	Private Sector	
BA-10	State	BA	TBD	Private Sector	
BA-11	State	BA	Paulo Afonso	Private Sector	
BA-12	State	BA	Paulo Afonso	Private Sector	
BA-13	State	BA	Paulo Afonso	Private Sector	
BA-14	State	BA	Paulo Afonso	Private Sector	
BA-15	State	BA	Paulo Afonso	Private Sector	
BA-16	State	BA	Paulo Afonso	Private Sector	
BA-17	State	BA	São Paulo	Private Sector	
PE-1	State	PE	Recife	Public Sector	
PE-2	State	PE	Recife	Public Sector	
PE-3	State	PE	Recife	Public Sector	
PE-4	State	PE	Recife	Public Sector	
PE-5	State	PE	Recife	Public Sector	
PE-6	State	PE	Recife	Public Sector	
PE-7	Local	PE	Petrolina	Private Sector	
PE-8	Local	PE	Petrolina	NGOS/Civil	
PE-9	Local	PE	Petrolina	NGOS/Civil	
PE-10	Local	PE	Petrolina	NGOS/Civil	
PE-11	Local	PE	Petrolina	Private Sector	
PE-12	Local	PE	Petrolina	Private Sector	
PE-13	Local	PE	Petrolina	Private Sector	
AL-1	State	AL	Maceió	TBD	
AL-2	State	AL	Maceió	Public Sector	

	Organization	Background
	Secretariat of Environmental and Water (two members) - at Paulo Afonso city – transboundary city with Alagoas, Bahia and Sergipe states	
	Agendha	Agronomy
	NGO - Agendha - Member of Brazilian Semiarid Articulation (ASA)	
	Civil Society - turism/ navegation	Entrepreneur
	Big Farm	Farmer
	Small Farm	Farmer
	Small Farm	Farmer
	Small Farm	Farmer
	Small Farm	Farmer
	Small Farm	Farmer
	Small Farm	Farmer
	Bahia State Secretariat for Environment and Water Resources	Lawyer and consultant
	Agência Estadual de Planejamento e Pesquisas de Pernambuco (FEDEM)	Urban planner
	Brazilian Army	Architecture
	UFPE	Professor of Water Management Hydraulic
	APAC	Engineering and Lawyer
	APAC	Engineering and head of the Agency
	Secretariat of Environmental and Water (Pernambuco state)	Architecture and Urban Planner
	Navigation Company	Private sector
	Sindicalista	Activist
	Civil Society	
	Civil Society	
	Big Farm	Farmer/Technician
	Small Farm	Farmer
	Small Farm	Farmer
	Codevasf	Lawyer focusing on Water Management
	Government - Secretariat of Environmental and Water (Alagoas state)	Engineering and Water Management expert

Code	Level	State	City	Sector	
AL-3	State	AL	Maceió	Public Sector	
AL-4	State	AL	Maceió	Public Sector	
AL-5	State	AL	Delmiro Gouveia	NGOS/Civil	
AL-6	State	AL	Delmiro Gouveia	NGOS/Civil	
AL-7	State	AL	Maceió	NGOS/Civil	
AL-8	Local	AL	Delmiro Gouveia	Private Sector	
AL-9	Local	AL	Delmiro Gouveia	Private Sector	
AL-10	Local	AL	Delmiro Gouveia	Private Sector	
AL-11	Local	AL	Delmiro Gouveia	NGOS/Civil	
AL-12	Local	AL	Delmiro Gouveia	NGOS/Civil	
AL-13	Local	AL	Piranhas	NGOS/Civil	
AL-14	Local	AL	Piranhas	NGOS/Civil	
AL-15	Local	AL	Delmiro Gouveia	NGOS/Civil	
AL-16	Local	AL	Delmiro Gouveia	NGOS/Civil	
AL-17	Local	AL	Delmiro Gouveia	Private Sector	
AL-18	Local	AL	Delmiro Gouveia	Private Sector	
AL-19	Local	AL	Delmiro Gouveia	Private Sector	
AL-20	Local	AL	Delmiro Gouveia	Private Sector	
AL-21	Local	AL	Delmiro Gouveia	Private Sector	
AL-22	Local	AL	Delmiro Gouveia	Private Sector	

	Organization	Background
	Terra Viva InstituteNGO /ASA/CBHSF	Senior agronomy - Agriculture
	UFAL	Hydrogeologist expert
	CEB, COPPABACS and ASA	Popular educator/Activist
	COPPABACS and ASA	Activist
	NGO	Agronomy
	Civil Society (Tourism sector)	Entrepreneur
	Politician	Politician
	Politician	Historian
	Civil society	
	Civil society	Historian
	Civil society	
	Civil society	
	NGO Civil Society representing the Territory Project - Inclusiveness Focus	Popular education
	COOPABAC	Agronomy
	Big Farmer Downstream	Small Farm
	Big Farmer Downstream	Farmer
	Big Farmer Downstream	Farmer
	Small Farm	Farmer
	Small Farm	Farmer
	Small Farm	Farmer

ANNEX E. MAIN ACTORS IN THE MULTI-LEVEL CASE STUDY

Scale	Actor	
Global	World Bank	
	Inter-American Development Bank (BIRD)	
National	Conselho Nacional de Recursos Hidricos -CNRH (Council National of Water)	
	Agência Nacional de Água - ANA (National Water Agency)	
	Ministério do Meio Ambiente - MMA (National Department of Environment)	
	Ministry of Agriculture	
	Ministry of National Integration	
	River Basin Committees for rivers of federal domain (CBHs)	
Basin	*Inspetoria Federal de Obras Contra as Secas - IFOCS* (Federal Department of Drought Control Service)	
	Departamento Nacional de Obras Contra as Secas - DNOCS (Department of Works against Droughts)	
	Departamento Nacional de Obras Contra as Secas - DNOCS (Department of Works against Droughts)	
	Comitê de Bacia do São Francisco - CBHSF (Watershed Committee of the Sao Francisco River)	
	Companhia de Desenvolvimento dos Vales do São Francisco e do Parnaíba CODEVASF (Company de Development of the Sao Francisco and Pamaiba Valleys)	
	Companhia Hidreletrica do São Francisco - CHESF (Hydropower Company of Sao Francisco)	
	Peixe Vivo Agency	
	Articulação Semiárido Brasileiro - ASA (Brazilian Semi-Arid Articulation)	

Source: (Ioris 2001; CBHSF, 2016, p. 17; OECD, 2015;OECD, 2015c)

	Responsibilities
	Grants loans and provides for projects and infrastructure in the water and sanitation sector.
	Provides technical and financial assistance in the water and sanitation sector.
	Responsible for approving general criteria for allocating water, including the granting of water permits; elaborate the National Water Resources Plan and deliberated on major issues and disputes
	Responsible for ensuring everyone's access to water resources.
	Implementation of the national water resources management system and regulation of water sues in federal water bodies. Planning, hydrologic monitoring, regulation (definition of rules and enforcement), issuing water permits in federal water bodies. This is also responsible to prevent, minimize the effects of droughts and floods and to mediate conflicts of interest involving water.
	The National Department of Environment coordinates policies related to freshwater, river basins (e.g., river revitalization programs), aquatic biodiversity, water resources, and coastal zones and oceans (OECD, 2015c, 64); formulates policies concerning climate change adaptation and the national policy on climate change (OECD, 2015c); promotes the integration of sustainable development in public policies at all levels of government and society
	The Ministry of Agriculture has an important role regarding irrigation, especially when it comes to financing and products pricing, its role is supplemented by the Ministry of National Integration – meu Irrigation Ministry plays an important role in water management as irrigation is the largest consumer of water in Brazil (OECD, 2015)
	The Ministry of National Integration responsible for inter-basin transfers that cross state boundaries, such as the São Francisco River basin in the Northeast of Brazil
	Approve the basin plan, arbitrate conflicts over water use, establish the values of bulk water use fees, and others.
	First federal agency created in 1909 aiming to offer solutions for the lack of drinking water in the Northeast region. IFOCS changed the name to IOCS later
	The major federal agencies involved in the development solutions for the lack of drinking water and physical irrigation in the São Francisco Region, including the states of Alagoas, Bahia, and Pernambuco created in 1945
	It is formed by 62 full members subdivided into three groups: 38.7% of users; 32.2% of represents of federal, state, and municipal authorities; 25.8% of civil society; and 3.3% of traditional communities. There are several entities among the committee members from the six states and the Federal District part of the basin (CBHSF, 2016)
	Public company focused on the physical development of the irrigated areas since the 1970's. It received internal investments from federal government and external investment from International Bank for Reconstruction and Development (BIRD), Inter-American Development Bank (IDB), Japanese Government, Fundo Ultramarino de Cooperação Econômica (OECF), AGROBER (state company from Hungary) and AGROINVEST (company from Hungary).
	CHESF is responsible for the implementation and operationalization of the multi-use hy-dropowers and dams. The organization was designed based on the North American Tennes-see Valley Authority planning as a model to develop the São Francisco Valley (Ioris 2001).
	Acts as a water agency and functions as the CBHSF's executive secretariat, providing technical support since 2010
	ASA has over 600 non-governmental organizations affiliates under the Semi-arid Articulation. In parallel to the 3rd Conference of the Parties to the Convention to Combat Desertification and Drought (COP3) of the United Nations hosted in Recife city in Pernambuco state in 1999, the organizations launched the Declaration of the Brazilian Semi-Arid. Considered as a ruptured document with the philosophy and actions of the drought combat, the Declaration points out structuring measures for the sustainable development of the region, guides a set of political measures and practices of coexistence with the Semiarid and, in this context, proposes the formulation of a program to build one million cisterns in the Brazilian Semi-Arid.

ANNEX F. LIST OF POLICY INSTRUMENTS ANALYSE IN TERMS OF GOAL ACHIEVED CONSIDERING THE ID DIMENSIONS

Level	Instrument	Policy instruments	
Federal	*Federalism*	*1988 Federal Constitution*	
	Priority of use	*National Water Law (Law No. 9433/1997)*	
	Human Right to Water	*National Water Law (Law No. 9433/1997)*	
	Water use permit	*National Water Law (Law No. 9433/1997)*	
	Protected areas	*National System of Protected Areas (Law No. 9985/2000)*	
	Climate proofing	*National Policy on Climate Change (Law No. 12.187/2009*	
	Disaster Risk Management	*National Policy of Civil Protection and Defence (Law No. 12608/ 2012)*	
SFRB	*Priority of use*	*National Water Law (Law No. 9433/1997)*	
	Irrigation systems	*Irrigation Policy (Law No. 12787/2013)*	
	Bulk water charge	*National Water Law (Law No. 9433/1997)*	
	Crisis Chamber	*1988 Federal Constitution*	
	Minimum flow	*Decree 3692/2000*	
BA	*Priority of Use*	*Law No. 11612 / 2009*	
	Water use permit	*Law No. 11612/2009*	
	Protected areas	*Law No. 10431/ 2006*	
	Minimum flow	*State Decree No. 6296/1997*	
PE	*Priority of use*	*Law No. 11.426/1997 art. 2, III*	
	Water use permit	*Law No. 12984/2005*	
	Protected areas	*Law No. 13787/09*	
	Minimum flow	*Decree No. 6296/1997*	
	Climate proofing	*Law No. 14090/2010*	
AL	*Priority of use*	*State Water Law No. 5965/1997*	
	Water use permit	*State Water Law No. 5965/1997*	
	Protected area	*State Law No. 7776/2016*	
	Minimum flow		

	Dimensions of ID						
	Social			Ecological		Relational	
	(i)	(ii)	(iii)	(i)	(ii)	(i)	(ii)
	Art. 3, I and III						
	Art. 1, III						
	Art. 11						
	Art. 11				Art. 11		
			Art. 4, VII	Art. 4, I to III		Art. 4, XIII	
				Art. 4, VI and VII		Art. 4, V	
	Art. 5, I to V			Art. 5, X and XI			
	Art. 1, III						
	Art. 4, III		Art. 4, II	Art. 4, I		Art. 4, III	
	Art. 19, III				Art. 19, III		Art. 19, III
			art 21, XVIII and XIX				art 21, XVIII and XIX
				Art. 17			
	Art. 2, II						
	Art. 17				Art. 17		
			Art. 4, VII	Art.4, I to III		Art. 4, XIII,	
	Art. 2, II						
	Art. 12				Art. 12		
			Art. 4, VII	Art.4, I to III			
			Art. 3, XIII	Art. 3, XIII		Art. 3, VI	Art. 3, XV
	Art. 1, III						
	Art. 16				Art. 16		
			art 4., I to III	art 4., I to III		art 4., XIV	

ANNEX G. SEMI-STRUCTURED QUESTIONNAIRE

(1) Professional profile

1.1Name/e-mail
Gender
Age (approximately)
Profession/Disciplinary background
Name of the organization where the interviewee currently works
Years that he/she works in the organization
Current position in the organization
1.2 Given your professional background as... (engineer/biologist/arquitect etc), what has been your relationship with water? Do you – in the position you currently fulfil – have any specific responsibility/function related to water?
1.3 What responsibilities/functions does your organization have in relation to water?
(multiple answers possible?)
a- Decision making/developing public policies
b- developing laws
c- developing quality standards
d- monitoring adherence to quality standards
e- Administration and provision
f- Infrastructure provision
g- Industrial Consumption
h- Consumption for mining
i- Consumption for agriculture/cattle breeding
j- Ecological activism
k- Social activism
l- Research
n - Other: (specify):

(2) Education

2.1 Which ideas/paradigms or approaches to water have been the most influential in your
work in the most recent years?

2.2 How did you develop these ideas/this approach?
a- Formal education
b- Experience/professional practice
c- Participation in networks (virtual or non-virtual)
d- Media
e- Other (specifcy):_____
2.3 Which organization/publications or authors have been most influential in this
respect?
2.4 Which concrete influence have these paradigms/approaches as well as these
organizations/publications and authors had in your daily work?

(3) Water governance

3.1 Do you think that over time there have been important changes in the water governance system in the São Francisco River Basin/ Brazil ? (Diagram - Stage of water)
3.2 What are the causes of these changes?
3.3 Which have been historically the most influential actors/organizations on water issues in the Basin/Brazil?
3.4 And which actors/institutions are this currently?
3.5 Why are they influential?
3.6 Do you think that in the last decade there have been significant changes in the decision making processes on water related issues in the river basin area?
3.7 If so, what are the causes?
3.8 Which actors have been historically the most influential actors/organizations on water issues in the basin? Which actors/organizations are currently the most influential?
3.9 With which other actors/organizations do you interact on themes related to water?
3.10 With which purpose?
3.11 How would you qualify this interaction?
3.12 Mainly formal/mainly informal – a mix of both?
3.13 Mainly leading to concensus – mainly conflictive – a mix of both?
3.14 Since when does this interaction take place?
3.15 With which frequency?

3.16 Do you share information with these actors/organizations? (e.g. Between sub-committee or national committee)
3.17 What are the potential challenges in the São Francisco River Basin? Challenge a- water quality; b – quantity; c - climate change; d- equitable utilization
3.18 What is the period in the river basin trajectory that the water is more or less stable?

(4) Instruments

4.1 How instruments and actors support effective water governance in the São Francisco River basin?
4.2 Which instruments and actors support shared control and which do not?
4.3Which instruments and actors of shared control prevent conflict and enhance cooperation?

(5) Climate change

5.1 To what extent do you think that climate change influences or will influence the water
related problems in the basin?
5.2 Which are or could be the groups in the basin most vulnerable to the effects of
climate change
5.3 Why?
5.4 Where are these groups located? (Use map of the river basin)

ANNEX H. TYPES OF LAND OWNERSHIP CONSIDERING LAND OCCUPATION TYPES IN RURAL BRAZIL

Types	Ownership	Description
Settlements (Assentamentos)	Public	Rural settlements created with state-assistance usually for land reform purposes
Indigenous Land	Public	Portion of territory inhabited by indigenous peoples and used for their productive activities and necessary for their welfare and their physical and cultural reproduction
Vacant Lands	Public	Public land not assigned to any specific use
Possession (Posse)	Public/Private	In public lands: can be individual or collective. Collective refers to traditional populations (culturally differentiated groups). Private lands include tenancy agreements such as lease and sharecropping but can also include informal occupation of private land.
Protected Areas	Public/Private	Geographically defined space, in public or private lands, which is designated to achieve specific conservation objectives, such as maintenance of ecosystem services and preservation of existing biological heritage. Different classes of protected areas impose different levels of use restrictions.
Property	Public/Private	Land owned by legal entities (public or private) or individuals.
Quilombolas	Private	Territories of ethnic groups with their historical trajectory, with a presumption of black ancestry linked to resistance to slavery.

Source: (Damasceno et al.,2017,p. 18)

ANNEX I. SFRB

PHYSICAL AND SOCIO-ECONOMIC CHARACTERISTICS OF THE SÃO FRANCISCO RIVER BASIN, BY PHYSIOGRAPHIC REGION

Characteristic	Total or Average	
Area, km²	638,5	
Area, %	100%	
Length of main stem, km	2,863Km	
States encompassed	MG, DF,GO, BA,PE,AL and SE	
Number of municipalities	452	
Population (million) and (%)	14.2 (100)	
Population in urban areas (million)	11,0	
Population density, population per km²	20.1	
Elevation, m	–	
Prevailing climate	–	
Availability of water, m³/per person/year	7,024	
Annual rainfall, mm/year, range and median value	1,036	
Principal hydroelectric dams (power output, MW)		
Irrigated area (2004), ha and (%)	342,712 (in 2004) 626,000(in 2015)	

The abbreviations of the federative units refer to Minas Gerais (MG), Goiás (GO), Bahia (BA), Pernambuco (PE), Alagoas (AL), Sergipe (SE) states and Federal District (DF).

Source: Adapted from (Brazil 2004; ANA 2015)

	Upper	Middle	Lower-middle	Lower
	100,1	402,5	110,5	25,4
	15.6%	63.1%	18.2%	3.1%
	1,003	1,152	568	140
	MG	MG, DF, GO, and BA	BA, PE, AL, and SE	PE, AL, and SE
	151	156	73	72
	7.1 (50.0)	3.5 (24.6)	2.2 (15.5)	1.4 (9.9)
	6,7	2,2	1,3	0,8
	62.9	8	16.8	68.7
	1,600 to 600	1,400 to 500	800 to 200	480 (sea level)
	Tropical humid and temperate	Tropical semi-arid and subhumid dry	Semi-arid and arid	Sub-humid
	6,003	15,167	899	1,172
	2,000 to 1,100 (1,372)	1,400 to 600 (1,052)	800 to 350 (693)	350 to 1,500 (957)
	Três Marias (396), Rio das Pedras (9.3), Cajuru (7.2), Queimados (10.5), Parauna (4.1)	*Sobradinho (1,050), Panderos (4.2), Correntina (9.0), Rio das Fêmeas (10.0)*	*Paulo Afonso I, II, III and IV (3,986), Moxotó (440), Itaparica (1,500), Xingó (3,000)*	
	44,091 (12.9)	170,760 (49.8)	93,180 (27.2)	34,681 (10.1)

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