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Inclusive development and multilevel transboundary water governance

The Kabul River

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Citation for published version (APA):

Hayat, S. (2020). *Inclusive development and multilevel transboundary water governance: The Kabul River.*

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ANNEX A: Thesis Log Frame

Main Research Question	
How can regional hydro-politics and institutions be transformed at multiple levels of governance through inclusive development objectives and incorporate the relationships with non-water sectors in addressing issues of water quality, quantity and climate change?	
GAPS IN SCIENTIFIC KNOWLEDGE	SUB-RESEARCH QUESTIONS
Gap 1 Transboundary water governance (TWG) literature rarely combines the role of institutions in dealing with hydro hegemony at multiple geographic levels	Sub-Research Question 1 1) How do power politics and institutions influence water governance in transboundary river basins at multiple geographic levels?
Gap 2 TWG literature scarcely links international relations (IR) scholarship with multilevel governance scholarship promoted by European Union scholars	Sub-Research Question 2 2) How can the concept of biodiversity and ESS be incorporated in a framework to analyse the effectiveness of institutions, and the role of power, in governing transboundary water resources?
Gap 3 TWG literature insufficiently highlights the role of water outside the basin (e.g. rainwater, snow, groundwater), the ecosystem services of water, and non-water related issues and actors in transboundary water research and policies.	Sub-Research Question 3 3) Which principles and instruments address the causes/drivers of freshwater problems in transboundary river basins at multiple geographic levels?
Gap 4 TWG literature scarcely focuses on including the inclusive development approach of international development studies which prioritizes inequality and focuses on socio-relational and ecological aspects.	Sub-Research Question 4 4) How does legal pluralism affect transboundary water cooperation?
Chapters	Research Question
1- Introduction	To highlight the real life and theoretical gaps, research questions, focus and limits as well as structure of the whole thesis.
2- Methodology and Analytical Framework	To situate the research in terms of current theoretical debates and elaborate the methodological approach.
3- Approaches to Transboundary Water Governance	How does power shape institutions and how do institutions limit the role of power in transboundary water governance at multiple geographic levels?
4- Ecosystem Services and Human	How can the various drivers of freshwater problems
Research Sub-Question	

	1) How do realist and institutionalist perspectives differ in international relations as well as in transboundary water governance? 2) How does power influence freshwater governance institutions at multiple geographic levels? 3) How does a combined approach of water governance and institutions help understand the influence of power at multiple geographic levels? 1) What causes problems to ESS of freshwater?

Well-being	affect the ecosystem services (ESS) of different kinds of freshwater and how does this, in turn, affect human well-being?	<p>2) How different types of freshwater have distinct ecosystem services?</p> <p>3) How protection and enhancement of ESS can lead to improved human well-being and achieving inclusive and sustainable development?</p>
5- Global Water Institutions & Its Relationship with Inclusive & Sustainable Development	How have global institutions for transboundary water management evolved and what are the implications of these institutions for governing transboundary river basins without a regulatory framework?	<p>1) How have the key global institutions for governing transboundary water resources evolved?</p> <p>2) Which governance instruments (principles and instruments) are included and which are excluded?</p> <p>3) How can the establishment of RBO's promote cooperation and reduce conflict in a transboundary river basin?</p> <p>4) How has power influenced the inclusion/exclusion of instruments (principles and instruments)?</p>
6- Analysis of International Relations in the Kabul River Basin	---	<p>1) How are various characteristics including ESS and drivers of freshwater problems taken into account at transboundary level in the KRB?</p> <p>2) How have freshwater governance frameworks evolved at transboundary level in the KRB?</p> <p>3) Which governance instruments address the drivers of freshwater problems at transboundary level in the KRB?</p> <p>4) How does legal pluralism occur at transboundary level in the KRB?</p> <p>5) How do power and institutions influence freshwater governance frameworks at transboundary level in the KRB?</p>
7- Analysis of Water Governance in Afghanistan	---	<p>1) How are various characteristics including ESS and drivers of freshwater problems taken into account at transboundary level in Afghanistan</p> <p>2) How have freshwater governance frameworks evolved at transboundary level in Afghanistan?</p> <p>3) Which governance instruments address the drivers of freshwater problems at transboundary level in Afghanistan?</p> <p>4) How does legal pluralism occur at transboundary level in Afghanistan?</p> <p>5) How do power and institutions influence freshwater governance frameworks at transboundary level in Afghanistan?</p>
8- Analysis of Multilevel Freshwater Governance in Pakistan	---	<p>1) How are various characteristics including ESS and drivers of freshwater problems taken into account at transboundary level in</p>

	---	<p>Pakistan?</p> <ol style="list-style-type: none"> 2) How have freshwater governance frameworks evolved at transboundary level in Pakistan? 3) Which governance instruments address the drivers of freshwater problems at transboundary level in Pakistan? 4) How does legal pluralism occur at transboundary level in Pakistan? 5) How do power and institutions influence freshwater governance frameworks at transboundary level in Pakistan?
<p>9- Multi-Level Integrated Analysis Focusing on Issues for Re-design</p>	<p>How do power and institutions influence multilevel freshwater governance in the KRB and the achievement of inclusive and sustainable development?</p>	<ol style="list-style-type: none"> 1) How are various characteristics including biodiversity, ESS and drivers of freshwater problems taken into account at multiple levels of governance in the KRB? 2) How have freshwater governance frameworks evolved at multiple levels of governance in the KRB? 3) Which governance instruments address the drivers of freshwater problems at multiple levels of governance in the KRB? 4) How does legal pluralism occur at multiple levels of governance in the KRB? 5) How do power and institutions influence water sharing at multiple level of governance in the KRB? 6) How can the current designs of the KRB multilevel institutional architecture become consistent with the key global institutions to achieve inclusive and sustainable development?
<p>10-Conclusion of Thesis</p>	<p>How can regional hydro-politics and institutions be transformed at multiple levels of governance through inclusive development objectives and incorporate the relationships with non-water sectors in addressing issues of water quality, quantity and climate change?</p>	<ol style="list-style-type: none"> 1) How can the concept of biodiversity and ESS be incorporated in a framework to analyse the effectiveness of institutions, and the role of power, in governing transboundary water resources? 2) Which principles and instruments address the causes/drivers of freshwater problems in transboundary river basins at multiple geographic levels? 3) How does legal pluralism affect transboundary water cooperation? 4) How do power politics and institutions influence water governance in transboundary river basins at multiple geographic levels?

ANNEX B: Keywords searched in scientific databases

Freshwater Resources	Transboundary Water Resources
Freshwater Governance	Transboundary Water Governance
Freshwater Resources Depletion	Transboundary Water Depletion
Freshwater Resources Contamination	Transboundary Water Contamination
Freshwater Resources Pollution	Transboundary Water Pollution
Freshwater Resources Quality	Transboundary Water Quality
Freshwater Resources Quantity	Transboundary Water Quantity
Freshwater Ecosystem Services	Transboundary Ecosystem Services
Blue Surface Water Resources	Issues in Transboundary River Basins
Blue Groundwater Resources	Challenges in Transboundary River Basins
White Water Resources	Transboundary Rivers in South Asia
Frozen water Resources/Frozen-water Resources	Transboundary Water Governance in South Asia
Greywater Resources/Grey-Water Resources	Water Governance in Transboundary River Basins
Blackwater Resources/Black-Water Resources	Water Governance in Transboundary Rivers
Atmospheric Moisture	Governance in Transboundary River Basins
Climate Change and Freshwater Resources	Climate Change and Transboundary Water Resources
Ecosystems Services and Freshwater Resources	Ecosystems Services and Transboundary Water Resources
Energy Production and Freshwater Resources	Energy Production and Transboundary Water Resources
Agriculture and Freshwater Resources	Agriculture and Transboundary Water Resources
Food and Freshwater Resources	Food and Transboundary Water Resources
Governance of Freshwater Resources	Governance of Transboundary Water Resources
Conflict over Freshwater Resources	Conflict over Transboundary water resource
Freshwater Conflict	Transboundary Water Conflict
Freshwater Politics	Transboundary Water Politics

ANNEX C: List of people interviewed

PROFESSIONAL BACKGROUND	Organization	COUNTRY
Activist	Kissan Board	Pakistan
Activist	PNRDP	Pakistan
Agriculturalist	Duran	Afghanistan
Agriculture Officer	Agricultural Research Institute	Pakistan
Anthropologist	Jalalabad State University	Afghanistan
Bureaucrat- Water Wing	Ministry of Water & Power	Pakistan
Businessman (Fruits and Vegetables)	Self-Employed	Afghanistan
Businessman (Mineral Water and Recycling)	Self-Employed	Afghanistan
Climate change Expert	NEPA	Afghanistan
Deputy Commissioner	IWC	Pakistan
Development Practitioner / Activist	NRSP	Pakistan
DRR Expert	Meher Foundation	Pakistan
Environmental Lawyer	Self-Employed	Afghanistan
Environmental Management/ Geosciences	Kabul University	Afghanistan
Farmer	WUA	Afghanistan
Farmer / Activist	WUA	Pakistan
Farmer / Development Practitioner	Kissan Board	Pakistan
Farmer / Water Expert	WUA	Pakistan
Farmer/ Activist	FO	Pakistan
Fishermen/Farmers/Activists/Boat Drivers	Local CSO	Afghanistan/Pakistan
Fishermen/Farmers/Activists/Boat Drivers	Local CSO	Afghanistan/Pakistan
Former Chief Engineer	WAPDA	Pakistan
Freelance Environmentalist	Self-employed	Afghanistan
Freelance Journalist & Water Policy Expert	DAWN/NEWS/Reuters	Pakistan
Hydrogeologist	AREU	Afghanistan
Hydrogeologist	Kabul University	Afghanistan
Hydrogeologist	AREU	Afghanistan
Hydrogeologist	AREU	Afghanistan
Hydrogeologist	Duran	Afghanistan
Hydrologist	WAPDA	Pakistan
Hydrologist/Lecturer	Kabul University	Afghanistan
Irrigation and Hydrology	FATA-Secretariat	Pakistan
Journalist / Water Expert	The Kabul Times	Afghanistan
Journalist and Water Policy Expert	The DAWN News	Pakistan
Journalist and Water Policy Expert	Kawish Media Group	Pakistan
Journalist/ Practitioner	Kabul Weekly	Afghanistan
Journalist/ Practitioner	Kabul Weekly	Afghanistan
Lawyer (Basic Human Rights)	Self-Employed	Afghanistan
Lawyer (environment & other legal matters)	Self-employed	Afghanistan
Manager Special Programmes	RSPN	Pakistan
Manager Special Water Project for GB	RSPN	Pakistan
Monitoring Officer	OFWAM	Pakistan
Public Health Officer	Public Health Department	Pakistan
Researcher- Irrigation and Water Institutions	IWMI	Afghanistan
Researcher- Irrigation and Water Institutions	IWMI	Afghanistan
Researcher/Hydrologist	Freelancer	Afghanistan

Researcher-Hydrology/Water Management	IWMI	Afghanistan
Research-Governance & Water Institutions	IWMI	Pakistan
Research-Governance & Water Institutions	IWMI	Afghanistan
Senator / Water Expert / Activist	Senate of Pakistan	Pakistan
Senator / Water Expert / Activist	Senate of Pakistan	Pakistan
Spate Irrigation Expert	SPO/MetaMeta	Pakistan
Structure Engineer	OFWM	Pakistan
Urban Development Department	Kabul Municipality	Afghanistan
WASH Expert	AFD	Pakistan
WASH Expert	Plan International	Pakistan
WASH Expert	NCA	Pakistan
Water and Agriculture Sciences Expert	CABI	Pakistan
Water and DRR Expert	UNDP	Pakistan
Water Expert	The World Bank	Pakistan
Water Expert	SWP	Pakistan
Water Expert	USAID	Pakistan
Water Expert/Professor	Agriculture University Peshawar	Pakistan
Water Management	AREU	Afghanistan
Water Management and Irrigation Expert	Agriculture University Peshawar	Pakistan
Water Policy	AREU	Afghanistan
Water Policy and Renewable Energy Expert	PPAF	Pakistan
Water Policy Expert	Duran	Afghanistan
Water Policy Researcher	IUCN	Pakistan
Water Policy Researcher	Water Aid	Pakistan
Water Policy Researcher and Practitioner	SPO	Pakistan
Water Quality Expert/Lecturer	Kabul Polytechnic Institute	Afghanistan

ANNEX D: List of constitutions, water laws & policies in Afghanistan

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ANNEX E: List of constitutions, water laws and policies in Pakistan

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ANNEX F: List of transboundary laws, proposal and discussions in the KRB

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- ❖ Meeting of Afghanistan, India and Pakistan’s key stakeholders, experts and engineers at a regional climate change conference in Dubai. 2015. Available from: <http://www.lead.org.pk/attachments/presentations/PAK-AFGHAN-stakeholder-consultation-meeting/Day1/Session%201%20B/Water%20Conflict%20Management%20and%20Cooperation%20between%20Afghanistan%20and%20Pakistan%20-%20Fahima%20&%20Shakib.pdf>.
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ANNEX G: Evolution of transboundary-level formal/informal water governance frameworks in the KRB

ANNEX G: Evolution of transboundary-level formal/informal water governance frameworks in the KRB

Period	Law/Policy/MoU/Official Press Briefing	Year of Adoption	Main Principles			
			Political	Environmental	Social	Economic
The Era Before 1947	The Frontier Agreement between British-administered Afghanistan and Russia	1873	<ul style="list-style-type: none"> • Sovereignty 			
	Agreement between British Empire & Afghan government	1921	<ul style="list-style-type: none"> • Sovereignty 	<ul style="list-style-type: none"> • Protection and Preservation of Ecosystems 	<ul style="list-style-type: none"> • Human Right to Water 	
	Agreement between Afghan government & state government in Chitral on Navigation in Kunar River	1933-34		<ul style="list-style-type: none"> • Protection and Preservation of Ecosystems 		
	Pakistan Federal Flood Commission proposal for 'Kabul River Treaty' with Afghanistan	2003	<ul style="list-style-type: none"> • Exchange of Information 			
The Era After 1947	Discussions between Pakistan's WAPDA and Afghanistan's Khost Province for a joint hydro-electric project	2006	<ul style="list-style-type: none"> • Obligation to Cooperate 			
	World Bank's proposal to secure a transboundary riparian agreement	2006	<ul style="list-style-type: none"> • Exchange of Information • Obligation to Cooperate 			
	Kuner cascades of Dam Project-(2 on Pakistan side and 3 in Afghanistan)	2008	<ul style="list-style-type: none"> • Exchange of Information 			
	Islamabad Declaration for regional collaboration in various sectors including water	2009	<ul style="list-style-type: none"> • Exchange of Information • Obligation to Cooperate 			
	Kabul River Basin Management Commission (KRBMC)	2011	<ul style="list-style-type: none"> • Exchange of Information • Obligation to Cooperate 		<ul style="list-style-type: none"> • Capacity Building 	<ul style="list-style-type: none"> • Water as an Economic Good
	Discussion between Finance ministers of Afghanistan and Pakistan for joint hydro-power projects on Kabul River	2013	<ul style="list-style-type: none"> • Obligation to Cooperate 			

ANNEX G: Evolution of transboundary-level formal/informal water governance frameworks in the KRB

	<p>The Joint Chamber of Commerce (APICC) initiative for joint hydropower projects on the Kabul River</p> <p>Meeting between Afghanistan's Ministry of Foreign Affairs and MEW with the Pakistani counterparts and the World Bank Officials in Dubai for transboundary water management</p> <p>Meeting of Afghanistan, India and Pakistan's key stakeholders, experts and engineers at a regional climate change conference in Dubai</p> <p>Government of Afghanistan, China, and Pakistan Proposal for a joint 1500 megawatt hydropower project</p> <p>Statement of officials from MEW-Afghanistan, during GLOF Conference in Islamabad</p>	<p>2014</p> <p>2014</p> <p>2015</p> <p>2015</p> <p>2015</p>	<ul style="list-style-type: none"> • Exchange of Information • Obligation to Cooperate <ul style="list-style-type: none"> • Exchange of Information <ul style="list-style-type: none"> • Exchange of Information • Obligation to Cooperate <ul style="list-style-type: none"> • Obligation to Cooperate • Peaceful Resolution of Disputes <ul style="list-style-type: none"> • Exchange of Information • Obligation to Cooperate 			
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ANNEX H: Evolution of water governance frameworks in Afghanistan

ANNEX H: Evolution of water governance frameworks in Afghanistan

Period	Laws	Year of Adoption	Implementation Level	Main Principles Included in the Law			
				Political	Environmental	Social	Economic
The Pre-Colonial Era	Ancient Customs	9000-1900 BCE	Local	<ul style="list-style-type: none"> Notification of emergency Situations 	<ul style="list-style-type: none"> Monitoring Pollution prevention 	<ul style="list-style-type: none"> Public Participation 	
	Islamic Law	652 CE	Local	<ul style="list-style-type: none"> Notification of planned measures Obligation to cooperate Peaceful resolution of disputes 	<ul style="list-style-type: none"> Pollution prevention Water as a finite resource 	<ul style="list-style-type: none"> Human Right to Sanitation Human Right to Water Priority of Use Public Awareness and Education Rights of Women, Youth, and Indigenous Peoples 	
	Canal and Drainage Act	1873	Provincial	<ul style="list-style-type: none"> Exchange of information Notification of emergency Situations Notification of planned measures Peaceful resolution of disputes 	<ul style="list-style-type: none"> Basin as the unit of management Pollution prevention Precautionary principle Protected areas for water 	<ul style="list-style-type: none"> Prior Informed Consent 	<ul style="list-style-type: none"> Polluter Pays
The Modern Era							
1939- 1980	Law regulating the sale of land under dams and rivers	1939	National		<ul style="list-style-type: none"> Water as a Finite Resource 	<ul style="list-style-type: none"> Capacity Building Public Participation Rights of Women, Youth, and Indigenous People 	
	Commercial Law Code of Afghanistan	1955	National		<ul style="list-style-type: none"> Protection and Preservation of Ecosystems 	<ul style="list-style-type: none"> Priority of Use 	<ul style="list-style-type: none"> Water as an Economic Good

ANNEX H: Evolution of water governance frameworks in Afghanistan

	Law concerning ownership, tax matter, and the price of water for lands below dams	1955	National	<ul style="list-style-type: none"> • Notification of Planned Measures • Peaceful Resolution of Disputes 		<ul style="list-style-type: none"> • Priority of Use • Capacity Building • Rights of Women, Youth, and Indigenous People 	<ul style="list-style-type: none"> • Water as an Economic Good
	Law fixing the price and sale of water	1962	National	<ul style="list-style-type: none"> • Notification of Planned Measures • Peaceful Resolution of Disputes 	<ul style="list-style-type: none"> • Precautionary Principle 	<ul style="list-style-type: none"> • Capacity Building • Priority of Use • Rights of Women, Youth, and Indigenous People 	<ul style="list-style-type: none"> • Water as an Economic Good
	Law on Pasture and Grazing Land	1971	National	<ul style="list-style-type: none"> • Obligation to Cooperate • Peaceful Resolution of Disputes 	<ul style="list-style-type: none"> • Protected Recharge and Discharge Zones • Protection and Preservation of Ecosystems 	<ul style="list-style-type: none"> • Public Awareness and Education • Public Participation 	
1980-1990	Afghan Water Law	1981	National	<ul style="list-style-type: none"> • Obligation to Cooperate • Peaceful Resolution of Disputes 	<ul style="list-style-type: none"> • Monitoring • Water as a Finite Resource 	<ul style="list-style-type: none"> • Capacity Building • Equitable and Reasonable Use • Priority of Use 	<ul style="list-style-type: none"> • Water as an Economic Good
1990-2000	Afghan Water Law	1991	National	<ul style="list-style-type: none"> • Obligation to Cooperate • Peaceful Resolution of Disputes 	<ul style="list-style-type: none"> • Monitoring • Water as a Finite Resource 	<ul style="list-style-type: none"> • Equitable and Reasonable Use • Priority of Use • Public Participation 	<ul style="list-style-type: none"> • Water as an Economic Good

ANNEX H: Evolution of water governance frameworks in Afghanistan

	<p>Constitution of Afghanistan</p>	<p>1931; 1964; 1977; 1980; 1987; 1992; 1994; 2004</p>	<p>National</p>	<ul style="list-style-type: none"> • Obligation to cooperate 	<ul style="list-style-type: none"> • Monitoring • Pollution Prevention • Protection and Preservation of Ecosystems 	<ul style="list-style-type: none"> • Equitable and Reasonable Use • Human Right to Water • Priority of Use • Rights of Women, Youth, and Indigenous People 	<ul style="list-style-type: none"> • Water as an Economic Good
	<p>Afghanistan Environmental Law</p>	<p>2007</p>	<p>National</p>	<ul style="list-style-type: none"> • Exchange of Information • Obligate to Cooperate 	<ul style="list-style-type: none"> • EIA • Monitoring • Pollution Prevention • Precautionary Principle • Protected Recharge and Discharge Zones • Protection and Preservation of Ecosystems 	<ul style="list-style-type: none"> • Capacity Building • Equitable and Reasonable Use • Human Right to Sanitation • Human Right to Water • Intergenerational Equity • Priority of Use • Public Awareness and Education 	<ul style="list-style-type: none"> • Water as an Economic Good
<p>2000-Current</p>	<p>Afghanistan Water Sector Strategies</p>	<p>July 2007a Oct 2007b</p>	<p>National</p>	<ul style="list-style-type: none"> • Exchange of Information • Notification of Planned Measures • Obligation to Cooperate • Peaceful Resolution of Disputes 	<ul style="list-style-type: none"> • EIA • Monitoring • Pollution Prevention • Precautionary Principle • Protection and Preservation of Ecosystems 	<ul style="list-style-type: none"> • Capacity Building • Equitable and Reasonable Use • Human Right to Sanitation • Human Right to Water • Intergenerational Equity • Public Awareness and Education • Rights of Women, Youth, and Indigenous People 	<ul style="list-style-type: none"> • Water as an Economic Good

ANNEX H: Evolution of water governance frameworks in Afghanistan

	Afghanistan Water Law	2009	National	<ul style="list-style-type: none"> • Exchange of Information • Obligation to Cooperate • Peaceful Resolution of Disputes 	<ul style="list-style-type: none"> • EIA • Monitoring • Pollution Prevention • Protected Recharge and Discharge Zones • Protection and Preservation of Ecosystems 	<ul style="list-style-type: none"> • Capacity Building • Equitable and Reasonable Use • Human Right to Sanitation • Human Right to Water • Priority of Use • Public Access to Information • Public Awareness and Education • Rights of Women, Youth, and Indigenous People 	<ul style="list-style-type: none"> • Polluter Pays • Water as an Economic Good
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ANNEX I: Evolution of freshwater governance frameworks from national to local level in Pakistan

ANNEX I: Evolution of freshwater governance frameworks from national to local level in Pakistan

Period	Laws/Policies	Year of Adoption	Implementation Level	Main Principles Included in the Law			
				Political	Environmental	Social	Economic
The Pre-Colonial Era	Ancient Customs	9000-1900 BCE	Local	<ul style="list-style-type: none"> Notification of emergency Situations 	<ul style="list-style-type: none"> Monitoring Pollution prevention 	<ul style="list-style-type: none"> Equitable and Reasonable Use Human Right to Sanitation Human Right to Water Public Participation 	
	Islamic Law	652 CE	Local	<ul style="list-style-type: none"> Notification of planned measures Obligation to cooperate Peaceful resolution of disputes 	<ul style="list-style-type: none"> Pollution prevention Water as a finite resource 	<ul style="list-style-type: none"> Equitable and Reasonable Use Human Right to Sanitation Human Right to Water Priority of Use Public Awareness and Education Rights of Women, Youth, and Indigenous Peoples 	
The Colonial Era	Pakistan Penal Code	1860	Federal		<ul style="list-style-type: none"> Pollution prevention Protection and preservation of ecosystems 		<ul style="list-style-type: none"> Polluter Pays
	Canal and Drainage Act	1873	Provincial	<ul style="list-style-type: none"> Exchange of information Notification of emergency Situations Notification of planned measures Peaceful resolution of disputes 	<ul style="list-style-type: none"> Basin as the unit of management Pollution prevention Precautionary principle Protected areas for water 	<ul style="list-style-type: none"> Prior Informed Consent 	<ul style="list-style-type: none"> Polluter Pays

ANNEX I: Evolution of freshwater governance frameworks from national to local level in Pakistan

Forest Act	1927	Federal	<ul style="list-style-type: none"> Notification of emergency Situations 	<ul style="list-style-type: none"> Monitoring Pollution prevention Precautionary principle 	<ul style="list-style-type: none"> Polluter Pays
First Period of Modern Era 1947 to 1977					
West Pakistan WAPDA Act	1958	Federal	<ul style="list-style-type: none"> Peaceful resolution of disputes 	<ul style="list-style-type: none"> Pollution prevention Protected areas for water 	<ul style="list-style-type: none"> Polluter Pays
Constitution of the Islamic Republic of Pakistan	1973	Federal	<ul style="list-style-type: none"> Peaceful resolution of disputes 	<ul style="list-style-type: none"> Water as a finite resource 	<ul style="list-style-type: none"> Public Access to Information Equitable and Reasonable Use Human Right to Sanitation Human Right to Water Public Access to Information Public Awareness and Education Public Participation Rights of Women, Youth, and Indigenous Peoples
Second Period of Modern Era 1977 to 1997					
National Conservation Strategy (NCS)	1992	Federal	<ul style="list-style-type: none"> Exchange of information Notification of emergency Situations Obligation to cooperate Peaceful resolution of disputes 	<ul style="list-style-type: none"> EIA Monitoring Pollution prevention Protected areas for water Protection and preservation of ecosystems 	<ul style="list-style-type: none"> Polluter Pays

The Post-Colonial or Modern Era

ANNEX I: Evolution of freshwater governance frameworks from national to local level in Pakistan

Indus River System Authority (IRSA) Ordinance	1992	Provincia I	<ul style="list-style-type: none"> Peaceful resolution of disputes 	<ul style="list-style-type: none"> Monitoring 	<ul style="list-style-type: none"> Equitable and Reasonable Use 	
North-West Frontier Province Irrigation & Drainage ACT (PIDA)	1997	Provincia I	<ul style="list-style-type: none"> Exchange of information 	<ul style="list-style-type: none"> Monitoring Pollution prevention 	<ul style="list-style-type: none"> Equitable and Reasonable Use 	<ul style="list-style-type: none"> Water as an Economic Good
Pakistan Environmental Protection Act (PEPA)	1997	Federal	<ul style="list-style-type: none"> Exchange of information 	<ul style="list-style-type: none"> EIA Monitoring Pollution prevention Protected areas for water 	<ul style="list-style-type: none"> Human Right to Sanitation Human Right to Water Public Access to Information Public Awareness and Education Public Participation 	<ul style="list-style-type: none"> Polluter Pays
Third Period of Modern Era 1997 to 2007						
National Environmental Action Plan (NEAP)	2001	Federal		<ul style="list-style-type: none"> EIA Monitoring Pollution prevention Protected areas for water 	<ul style="list-style-type: none"> Human Right to Sanitation Human Right to Water Public Access to Information Public Awareness and Education Public Participation 	<ul style="list-style-type: none"> Polluter Pays
Cantonments Ordinance	2002	Federal			<ul style="list-style-type: none"> Human Right to Sanitation Human Right to Water 	
National Energy Conservation Policy (NEC)	2005	Federal		<ul style="list-style-type: none"> Pollution Prevention 	<ul style="list-style-type: none"> Human Right to Sanitation Human Right to Water Public Awareness and Education 	

ANNEX I: Evolution of freshwater governance frameworks from national to local level in Pakistan

	National Environment Policy (NEP)	2005	Federal	<ul style="list-style-type: none"> • Exchange of Information • Notification of Emergency Situations • Obligation to Cooperate 	<ul style="list-style-type: none"> • EIA • Invasive Species Monitoring • Pollution Prevention • Protected Areas for water • Protected Recharge and Discharge Zones 	<ul style="list-style-type: none"> • Capacity Building • Equitable and Reasonable Use • Human Right to Sanitation • Human Right to Water • Intergenerational Equity • Poverty Eradication • Public Access to Information • Public Awareness and Education • Public Participation 	<ul style="list-style-type: none"> • Water as an Economic Good
	National Fisheries Policy (NFP)	2006	Federal	<ul style="list-style-type: none"> • Exchange of Information • Obligation to Cooperate 	<ul style="list-style-type: none"> • Monitoring 	<ul style="list-style-type: none"> • Capacity Building • Poverty Eradication • Public Awareness and Education 	
	National Water Policy (approved by cabinet in 2009)	2006	Federal	<ul style="list-style-type: none"> • Exchange of Information • Obligation to Cooperate • Peaceful Resolution of Disputes 	<ul style="list-style-type: none"> • Conjunctive Use • EIA • Monitoring • Pollution Prevention • Protected Areas for water • Protected Recharge and Discharge Zones • Protection and Preservation of Ecosystems • Subsidiarity • Water as a Finite Resource 	<ul style="list-style-type: none"> • Capacity Building • Equitable and Reasonable Use • Human Right to Sanitation • Human Right to Water • Intergenerational Equity • Poverty Eradication • Priority of Use • Public Awareness and Education • Public Participation 	<ul style="list-style-type: none"> • Polluter Pays • Water as an Economic Good

ANNEX I: Evolution of freshwater governance frameworks from national to local level in Pakistan

	National Sanitation Policy (NSP)	2006	Federal	<ul style="list-style-type: none"> • Exchange of Information • Obligation to Cooperate 	<ul style="list-style-type: none"> • Monitoring • Pollution Prevention 	<ul style="list-style-type: none"> • Capacity Building • Equitable and Reasonable Use • Human Right to Sanitation • Human Right to Water • Poverty Eradication • Public Awareness and Education • Public Participation • Rights of Women, Youth, and Indigenous Peoples 	
Fourth Period of Modern Era 2007 to Present							
	National Drinking Water Policy	2009	Federal	<ul style="list-style-type: none"> • Exchange of Information • Notification of Emergency Situations 	<ul style="list-style-type: none"> • EIA • Monitoring • Pollution Prevention 	<ul style="list-style-type: none"> • Capacity Building • Equitable and Reasonable Use • Human Right to Sanitation • Human Right to Water • Priority of Use • Public Awareness and Education • Public Participation • Rights of Women, Youth, and Indigenous Peoples 	

ANNEX I: Evolution of freshwater governance frameworks from national to local level in Pakistan

<p>Pakistan National Wetlands Policy</p>	<p>2009</p>	<p>Federal</p>	<ul style="list-style-type: none"> • Exchange of Information • Peaceful Resolution of Disputes 	<ul style="list-style-type: none"> • EIA • Invasive Species Monitoring • Pollution Prevention • Precautionary Principle • Protected Areas for water • Protected Recharge and Discharge Zones • Water as a Finite Resource 	<ul style="list-style-type: none"> • Capacity Building • Equitable and Reasonable Use • Human Right to Sanitation • Human Right to Water • Intergenerational Equity • Poverty Eradication • Public Access to Information • Public Awareness and Education • Public Participation 	<ul style="list-style-type: none"> • Polluter Pays • Water as an Economic Good
<p>National Climate Change Policy</p>	<p>2012</p>	<p>Federal</p>	<ul style="list-style-type: none"> • Exchange of Information • Obligation to Cooperate 	<ul style="list-style-type: none"> • EIA • Monitoring • Pollution Prevention • Precautionary Principle • Protected Areas for water • Protected Recharge and Discharge Zones • Protection and Preservation of Ecosystems • Water as a Finite Resource 	<ul style="list-style-type: none"> • Capacity Building • Poverty Eradication • Public Awareness and Education • Public Participation • Rights of Women, Youth, and Indigenous Peoples 	

ANNEX I: Evolution of freshwater governance frameworks from national to local level in Pakistan

Biodiversity Action Plan	2015	Federal	<ul style="list-style-type: none"> • Exchange of Information • Obligation to Cooperate 	<ul style="list-style-type: none"> • EIA • Invasive Species Monitoring • Pollution Prevention • Precautionary Principle • Protection and Preservation of Ecosystems 	<ul style="list-style-type: none"> • Capacity Building • Equitable and Reasonable Use • Poverty Eradication • Public Access to Information • Public Awareness and Education • Public Participation • Rights of Women, Youth, and Indigenous Peoples 	
National Forest Policy	2015	Federal	<ul style="list-style-type: none"> • Notification of Planned Measures 	<ul style="list-style-type: none"> • Pollution Prevention • Protected Areas for water • Protection and Preservation of Ecosystems 		
National Food Security Policy (Draft)	2017	Federal	<ul style="list-style-type: none"> • Peaceful Resolution of Disputes 	<ul style="list-style-type: none"> • Monitoring • Pollution Prevention • Protected Areas for water • Water as a Finite Resource 	<ul style="list-style-type: none"> • Human Right to Sanitation • Human Right to Water • Intergenerational Equity • Poverty Eradication • Public Awareness and Education 	

ANNEX J: Major principles & instruments in Pakistan’s multilevel water governance frameworks

	Local Customs	Sharia Law	The 1860 Pakistan Panel Code	The 1873 Canal and drainage act	The 1927 forest act	The 1958 West Pakistan WAPDA act	The 1973 Constitution of the Islamic Republic of Pakistan	The 1992 National Conservation Strategy	The 1991 Interprovincial Water Apportionment Accord	The 1997 North-west frontier province irrigation and drainage	The 1997 Pakistan Environmental protection act (PEPA)	The 2001 National Environmental Plan (NEAP)	The 2002 Cantonments ordinance	The 2005 National Energy Conservation Policy (NEC)	The 2005 National Environment Policy	The 2006 National Fisheries Policy (NFP)	The 2018 National Water Policy (approved in 2009)	The 2006 National Sanitation Policy (NSP)	The 2009 National Drinking Water Policy	The 2009 Pakistan National Wetlands policy	The 2012 National Climate Change Policy	The 2015 Biodiversity Action Plan	The 2015 National Forest Policy	The 2017 National Food and Security Policy(draft)	
Political Principles																									
Information exchange																									
Notification of Emergency Situations																									
Notification of Planned Measures																									
Obligation to Cooperate																									
Peaceful settlement of Disputes																									
Limited Territorial Sovereignty/ Do Not Harm																									
Environmental Principles																									
Basin as the Unit of Management																									
BATT																									
Conjunctive Use																									
EIA																									
Invasive Species																									
Monitoring																									
Prevention of Pollution																									

ANNEX J: Major principles & instruments in Pakistan’s multilevel water governance frameworks

Precautionary Principle																				
Protected Areas for Water																				
Protected Recharge and Discharge Zones																				
Protection and Preservation of Ecosystems																				
Polluters Pay																				
Water as a Finite Resource																				
Social Principles																				
Capacity Building																				
Equitable & Reasonable Use																				
Human Right to Water & Sanitation																				
Intergenerational Equity																				
Poverty Eradication																				
Prior Informed Consent																				
Priority of Use																				
Public Access to Information																				
Public Awareness & Education																				
Public Participation																				
Rights of Women, Youth, & Indigenous Peoples																				
Food Security																				
Human Well-being																				
Quality Education																				
Clean Energy																				

ANNEX K: Multilevel ecosystem services in the KRB

ESS	Transboundary	Afghanistan	Pakistan
Supporting	<p>Soil formation (sediment retention and accumulation of organic matter)</p> <p>Habitat provision (provision of habitat for wildlife feeding, shelter and reproduction)</p> <p>Nutrient cycling (storage, recycling, processing and acquisition of nutrients)</p>	<p>Habitat availability & genetic diversity ensure the functioning of all other services. Freshwater biodiversity of Koh-e Baba sustaining the provision of all ESS in the area Home to a large number of breeding and migratory birds Supporting diverse plant species & wildlife such as wolves, fox, wild cats, rabbit, deer, bats and numerous birds Genetic diversity of wild relatives of wheat and other flora provide genes of resilience and resistance to disease</p> <p>Natural storage facility</p> <p>Sustaining the vital flow in rivers through snow accumulation during winter, snow melt and rainfalls during spring, and release of frozen water from glaciers in summer</p> <p>Largest potential for irrigated agriculture and hydropower;</p> <p>Maintaining watersheds for the future prosperity; Freshwater in the KRB can enhance cross-border cooperation with neighbour countries</p>	<p>Soil formation through sediment holding and accumulation of organic matter</p> <p>Nutrient storage</p> <p>Recycling, processing, and acquisition of nutrients</p> <p>Freshwater wetlands reduce the risk of pollution from agriculture runoff</p>
Provisioning	<p>Water collection from catchment areas through rainfall, snow melt & glacial melt; Water for irrigation, effluent & waste disposal, watering livestock, fishing, recreation, transportation, shelter, medicine, furniture, fuel washing and bathing; Water for livelihoods of many local people; Water for power supply system; Provisioning of groundwater through infiltration in muddy floodplains; Kabul River serves as an indicator of proper land use and land management</p>	<p>Natural storage facility</p> <p>Sustaining the vital flow in rivers through snow accumulation during winter, snow melt and rainfalls during spring, and release of frozen water from glaciers in summer</p> <p>Largest potential for irrigated agriculture and hydropower;</p> <p>Maintaining watersheds for the future prosperity; Freshwater in the KRB can enhance cross-border cooperation with neighbour countries</p>	<p>Production of food, fish, fruits, fibre, fuelwood and fodder; Freshwater storage and retention of water for domestic, industrial and agricultural use; Indus Flyway serve as migration route for ducks and wildfowl which provide local food sources for communities; Irrigates 17 million ha of farmland and provides employment to 40% population;</p> <p>The riverine forests and mangroves provide timber and fuelwood for local communities</p>
Regulating	<p>Hydrological regulation through flood water usage for irrigation in arid zones</p> <p>Groundwater recharge through infiltration of flood water into the ground</p> <p>Water quality improvement by removing nutrients and pollutants through soil layers</p> <p>Assimilation of organic waste by certain aquatic fauna such as fish and turtle</p> <p>Nutrients sequestration</p> <p>Forested floodplain prevent nonpoint source pollution from entering small streams</p> <p>Climate regulation through carbon sequestration in the floodplains and surrounding forests</p>	<p>Freshwater in Afghanistan naturally increases susceptibility to the processes of soil erosion</p> <p>Rainfed farming is especially detrimental to soil retention</p> <p>Preserve the natural vegetation and prevent soil erosion which enhance the productivity</p> <p>Pollination is indirect regulating service which provides an alternative source of income for local communities</p>	<p>Climate regulation by providing sinks for greenhouse gases; influencing local and regional temperature, precipitation and other climatic processes</p> <p>Water regulation (hydrological flows) and groundwater recharge/discharge</p> <p>Water purification by removing nutrients and other pollutants</p> <p>Natural hazard regulation, storm protection and pollination habitat for pollinators</p> <p>Kabul-Indus basin support three quarters of Pakistani population and irrigates 80% cropland</p> <p>Erosion regulation by slowing down the flow of water</p> <p>River beds and lakes provide support in flood control, provide an escape for floodwaters, holding them back and reducing the flood intensity</p>

<p>Cultural</p>	<p>Recreational uses such as fishing, hunting waterfowl sports, canoeing, kayaking, white water rafting, sport fishing, swimming Opportunity to worshipers to access water and clean themselves Mass bathing and opportunity for social gathering mostly in summers Riverside restaurants attract tourists and provide peace and quiet environment Inspiring the imagination of the local people through songs</p>	<p>The snow line on the peak of the Koh-e Allah spell out the word 'Allah' is of cultural significance Sacred natural hot springs attracted many tourists before the war Provides opportunities for hiking and backcountry skiing as well as ecotourism to local communities and tourists Many caves in the KRB on Afghanistan's side have ancient animal carvings that locals visit Shrines in the KRB commemorate significant events A mix of formal and traditional institutions in the KRB governs a patchy and uncertain land tenure system</p>	<p>Spiritual and religious freshwater attributes, with shrines of Pir, Saints, Suffis and other religious leaders in some coastal and wetland areas Shrines around Kalakhar Lake has archaeological and historical features that attract visitors Mythological stories attract pilgrims and visitors during festivals Lakes, beaches, rivers and streams carry recreational values which helped in establishing special tourism authorities, e.g., Tourism Corporation Development of Pakistan (TCDP), Tourism Corporation Khyber Pakhtunkhwa (TCKP), Tourism Development Corporation of Punjab (TDCP), Sindh Tourism Development Corporation (STDC) and The Department of Culture, Archives and Tourism in Balochistan Rivers, lakes and streams are being used for educational purposes, creating awareness amongst local schools and colleges about the importance of water</p>
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Source: Reproduced from Tables 6.1, 7.1 and 8.1