

Crossing the river while feeling for stones

Challenges of river basin governance in Vietnam

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Abstract

Water scarcity is increasing across different geographical regions of Vietnam. Central drivers of scarcity include population growth and climate change which increase demand and sectoral competition. The legal system is keeping pace to address this trend, but gaps remain in terms of implementation and enforcement. This purpose of this study was to improve the understanding of those gaps via polycentric governance analysis at river-basin level in Vietnam, using a theoretical framework designed for determining functionality of polycentric governance systems. The results, based on semi-structured interviews and thematic analysis, suggest that the water governance system in Vietnam is polycentric to a high degree, but with limited functionality. They also imply that the benefits predicted by the polycentric governance model are based on assumptions that should be adjusted and evaluated against the context to which it is applied. The emphasis of relationships between decision-making centres in the polycentric system provides a new angle of insight to water tenure arrangements. The thesis argues that a deeper and more deliberate understanding of the nature of the governance system in Vietnam can improve capacities for institutional design choice according to different boundaries, priorities, and national characteristics.

Keywords: Vietnam, water governance, river basin organisations, adaptive governance, polycentric governance, bioregional governance, commons governance, water tenure

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List of acronyms

2S River Basin	Sesan-Srepok River Basin
CPV	Communist Party of Vietnam
DARD	Department of Agriculture and Rural Development
DMC	Decision-making Centre
DONRE	Department of Natural Resources and Environment
EVN	Vietnam Electricity
FAO	Food and Agriculture Organization of the United Nations
GWP	Global Water Partnership
MARD	Ministry of Agriculture and Rural Development
MOC	Ministry of Construction
MOF	Ministry of Finance
MOH	Ministry of Health
MOIT	Ministry of Industry and Trade
MONRE	Ministry of Natural Resources and Environment
MOPS	Ministry of Public Security
MOST	Ministry of Science and Technology
MPI	Ministry of Planning and Investment
MOT	Ministry of Transport
MRC	Mekong River Commission
MRD	Mekong River Delta
OTF	Operational Theoretical Framework
RBO	River Basin Organisation
RRBO	Red River Basin Organisation
RRD	Red River Delta
SIWI	Stockholm International Water Institute
SEA	Southeast Asia
UNDP	United Nations Development Programme
VFF	Vietnam Fatherland Front
VLC	Vietnam Labour Confederation
VNMC	Vietnam National Mekong Committee

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1. Introduction

1.1 Problems in unfamiliar places

Water scarcity is increasing in Southeast Asia (SEA), a seemingly water-abundant region with seasonally wet tropical countries endowed with plenty of water resources. The Food and Agriculture Organization of the United Nations (FAO) defines water scarcity “as a gap between available supply and expressed demand of freshwater in a specified domain, under prevailing institutional arrangements (including both resource ‘pricing’ and retail charging arrangements) and infrastructural conditions.” (FAO, 2012: 5). The FAO Asia-Pacific Water Scarcity Programme (WSP) breaks down the concept into four main categories: 1) too little water, 2) too much variability, 3) over-utilisation, and 4) poor water quality (FAO, 2019).

Population growth, particularly in urban areas, and climate change are the main drivers of scarcity in the region (FAO, 2019). Water re-allocation from agriculture (a sector accounting for around 72 percent of freshwater withdrawals globally, and 80 percent in Vietnam) is a commonly used method for satisfying the increased freshwater demand in growing urban areas (Garrick et al., 2019; UNESCO, 2023; IWRP & AMPERES, 2021). Climate change increases demand while limiting supply of freshwater, for example by increasing seasonal variability of rainfall and the frequency and severity of droughts (Tilleard et al. 2023; FAO, 2019).

Growing scarcity puts pressure on the relationships between all stakeholders – from water users to water management authorities to service providers – all situated within a governance system dependent on effective institutions for policymaking, empowerment, and oversight (Grigg, 2016). Designing institutions that can deal with these pressures, conflicts and challenges in an effective and sustainable way is one of the central challenges for governance of natural resources and ecosystems (Huitema & Meijerink, 2014). Literature on commons governance and tenure relationships have generally focused on community-level cases where systems are smaller and arguably less complicated (Carlisle & Gruby, 2019; Neef et al. 2004; 2006)). But interactions between humans and the environment takes place at various scales, justifying broader basin-level analyses (ibid).

1.2 The case of Vietnam

Vietnam reflects the challenges mentioned above while facing all four types of water scarcity across its different regions (IWRP & AMPERES, 2021). The country is one of the most

vulnerable in the world to climate change, largely due to its rich biodiversity and vast coastline stretching 3260 kilometres, hosting major cities and hotspots for economic productivity (World Bank, 2022). The Mekong River Delta (MRD) in the South and the Red River Delta (RRD) in the North are two important hotspots. The MRD is vulnerable to sea-level rise and upstream activity on the Mekong River increasing saltwater intrusion, while decreasing sedimentation and nutrients, fish migration patterns, and water flows (MRC, 2018). The RRD is under pressure from competing interests, where freshwater use accounts for about 50 percent of Vietnam's industrial demand while supplying urban centres, irrigation systems, producing electricity, and other purposes (IWRP & AMPERES, 2021). Another central function of water management in Vietnam is disaster risk management, mitigating seasonal floods and droughts (ibid).

In Vietnam, water scarcity is a growing threat where water availability was previously taken for granted, presenting complicated challenges for a water governance system used to abundance. Water governance at river basin-level via River Basin Organisations (RBOs) has been ineffective, despite being enshrined in law and organised in different forms under different ministries over decades (Le, 2022; Molle & Hoanh, 2009). RBOs are, put briefly, special-purpose water management authorities at sub-national level, organised for bioregional governance (Huitema & Meijerink, 2014). For water resources management, bioregional governance means managing water at basin or watershed level, as close as possible to the natural boundaries of surface water flow (aquifer systems can be non-coterminous with river basins) (Huitema et al. 2009; Molle & Vester, 2009).

1.3 Research problem

These social-economic-environmental pressures exacerbated by increasing water scarcity are naturally complex and interrelated, requiring effective governance at different levels for mitigation (Grigg, 2016). The challenges for effective water governance are reflected in Vietnam but with local characteristics and contextual challenges (Le, 2023). These challenges limit implementation capacity of new and complex systems approaches, such as Integrated Water Resources Management (IWRM) principles, including basin governance and water allocation which ultimately affects water security (ibid).

While there is a comprehensive legal system for governing water resources in Vietnam, information about actual water use is limited, coupled with a general lack of enforcement of laws, policies, strategies, and financing (Le, 2022). From a governance perspective, there is a

lack of comprehensive and rigorous analyses of water resource management, relationships and use in Vietnam. A World Bank report on water governance (2019) provides a substantial descriptive and relatively recent overview but remains academically disconnected. Some studies indicate that the Vietnamese governance system is polycentric but does not apply any extensive polycentric analysis nor do they evaluate the applicability of the concept in the Vietnamese setting (Du et al. 2016; Hoanh et al. 2014). This gap, combined with the drivers of water scarcity, underscores a clear need for an empirical analysis using relevant theoretical frameworks of commons governance, specifically polycentric governance, connoting “many centres of decision-making which are formally dependent on each other” (Ostrom et al., 1961: 831).

1.4 Relevance and purpose

The overarching purpose, or aim, of this thesis is to contribute to understanding water governance in Vietnam and the general role of governance systems for improving water resource management. The objective is to provide insights for water governance via a diagnostic of Vietnam’s water governance system using a polycentric governance analysis framework, linking it to river basin governance and water tenure. Water tenure is defined as “the relationship, whether legally or customarily defined, between people, as individuals or groups, with respect to water resources.” (Hodgson, 2016: 12).

Firstly, as pressure mounts on water resources globally, regionally, and in Vietnam, understanding the challenges of governance, institutional design, and relationships between water users and use sectors is central to improving resource management. Secondly, by applying a polycentric governance analysis model, the ambition is to explain challenges of setting up, running, and maintaining effective and functional RBOs in Vietnam. Thirdly, the inquiry may contribute to elevating the water tenure approach in Vietnam by looking at implications of polycentric governance on water tenure arrangements.

The primary relevance of building on water tenure research is the focus on relationships between water users and use sectors, managers, operators, and water resources, and how they are governed, which may highlight specific areas of improvement in water use and allocation (Hodgson, 2016). Some of these have been identified by Dr Le Van Chinh in the first water tenure analysis for Vietnam, included in the literature review below in section 1.6. Drawing on semi-structured interviews with Vietnamese government officials, academics, and water professionals, this thesis employs a qualitative case-study approach for understanding water

tenure in Vietnam at the river basin-scale. The polycentric governance model also focusses on relationships, mainly between decision-makers and the rules that they inform and operate by. The polycentric lens could provide new insights and approaches for understanding water tenure which is a novel and understudied concept (Hodgson, 2016).

1.5 Research questions

What accounts for the gap between legal frameworks (law, policy, plans) and their enforcement in terms of water resources management on the river-basin scale in Vietnam?

- What accounts for current decision-making and governance challenges of Vietnamese RBOs?
- What implications could the polycentric governance model have regarding water tenure in Vietnam?

1.6 Literature review

This paper is positioned within the nexus of literature on water resource governance and water tenure, looking at relationships between people and water as a resource (specifically in river basins), as opposed more abstract references to water as, for example, a human right (Hodgson, 2016). First, it is necessary to describe water governance broadly because water tenure and water governance are reciprocal, where one could see the governance of water tenure, but also water tenure as an indispensable part of water governance (ibid). The subchapter will then review literature on water tenure, and finish with river basin governance.

1.6.1 The broad base of water governance

Integrated Water Resources Management (IWRM) is a systems approach to water management for balancing cross-sectoral needs and pressures relating to water resources (Grigg, 2016). The Global Water Partnership (GWP) defines IWRM as “a process which promotes the coordinated development and management of water, land and related resources in order to maximise economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems and the environment” (GWP, 2011). But for IWRM to be effectively implemented, the most crucial prerequisite is effective water governance, which is made up of a country’s laws, culture and organisations – the combination of which is essential for controlled and systemic collective action (Grigg, 2016: 99).

Water governance is a broad and elusive concept. However, as alternatives for improving or optimising water supply are decreasing, and water demand is getting difficult to control, water governance has become one of the most important topics of sound water management (Lautze et al., 2011; Grigg, 2016).

	Water governance	Good water governance
SIWI (n. d.)	“Water governance refers to the political, social, economic, and administrative systems that influence the use and management of water. It is essentially about who gets what water, when and how, and who has the right to water, its related services and their benefits.”	“Ultimately, good water governance is the foundation and prerequisite for a more sustainable and equal world.”
Lautze et al. (2011: 7)	“ <i>Water Governance</i> consists of the processes and institutions by which decisions that affect water are made. Water governance does not include practical, technical and routine management functions such as modelling, forecasting, constructing infrastructure and staffing. Water governance does not include water resources outcomes”	“ <i>Good Water Governance Qualities</i> can be proposed as: openness and transparency; broad participation; rule of law (predictability); and ethics, including integrity (control of corruption).”

SIWIs definition of good water governance is goal-oriented, toward a “sustainable and equal world”, whereas Lautze et al. offers a more process-oriented approach to the concept mentioning a range of “qualities” relating to good water governance (SIWI, n. d., Lautze et al. 2011: 7). The difference between these two definitions highlights Castro’s discussion on the complexity of the concept of water governance and different interpretations that arise – some see water governance as an instrument for reaching certain goals, while others see it as a process which can help formulate clear goals (2007: 98).

If problems are identified which could be resolved through improved water governance, then it can work as a framework of tools for solving that set of problems. At the same time, as water governance improves and evolves to be applied in different circumstances and contexts, new goals may arise through that process. Water governance is a living concept, and the contradiction of definitions is not as much of a contradiction as it is a realistic view of a concept evolving over time.

1.6.2 Water tenure

Stephen Hodgson (2016) has conceptualised water tenure as a complementary set of legal arrangements to the more frequently discussed topic of land tenure, and necessary for

sustainable water use and management. Water tenure is always there, in one or other shape or form, regardless of legal system and arrangements. The fact that water flows add complexity to its tenure, since upstream use affects downstream use, connecting tenure holders in more complex relationships and larger geographies compared to land tenure (ibid).

The word ‘tenure’ means the *right* to hold or possess rather than the act of holding or possessing. Tenure implies the combination of holding or possessing and the recognition of this right through formal or customary law (Bruce, 1998). The more frequently used concept of ‘water rights’ is narrower than water tenure (Hodgson, 2016). The definition of water tenure is derived from the ‘Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security’ (VGGT), which are accepted and adapted in the context of Vietnam (FAO, 2022; MRLG, 2017).

Water tenure is concerned with claims over specific water *resources* in the same way that land tenure is concerned with specific land plots. Water tenure relates to the use of water in the natural environment, such as the water in streams, rivers, lakes and groundwater sources, and each tenure arrangement is concerned with a *relationship* to water contained in a specific source, including relationships between people and their water use (Hodgson, 2016). The key term, as understood for the purposes of this paper, is ‘*relationship(s)*’ and the many complex shapes they can take in the context of water resources use. ‘Water resources’ is distinct from engaging with ‘water’ in a broader sense, since supply of clean water to households is a service rather than a right to share a specific water resource. However, the city, municipality, or other actor responsible for providing clean water to households often accesses that water from a large source, placing them as a stakeholder within the water tenure context (ibid).

Dr Le Van Chinh at Thuy Loi University wrote the first and only water tenure analysis to date in Vietnam. The study was carried out for the Nui Coc irrigation system (in the RRB) and aimed to identify the different types of water tenure arrangements used and how those overlay with legal frameworks (Le, 2023). By mapping the laws that regulate the use of water resources and comparing the water tenure arrangements which are explicit in Vietnamese national law to those that are operational in the Nui Coc irrigation system, the analysis finds that there is a strong legal foundation for water tenure in Vietnam, but enforcement and implementation is lacking (ibid). The suggested causes of this are that the regulations themselves are lacking in components which facilitate implementation or enforcement, and that the capacity of water management agencies is limited. The study highlights that assumed

water tenure is common among state operated irrigation systems, leading to gaps of management insight and overview. The data gathering was carried out in 2021 when Covid-19 impacted possibilities for fieldwork, limiting data collection opportunities and the inclusion of customary tenure arrangements in the analysis (ibid).

Andreas Neef et al. (2006) take a comparative look at different policies governing natural resources in Thailand and Vietnam, specifically their mountainous, forest-dense northern parts, and the implications of those policies in practice. The study looks at land policies, forestry policies, water policies, and major actors managing those resources. However, the study looks more specifically at water rights which is, as mentioned in the previous chapter, a narrower concept than water tenure. The results of the case indicate that customary land tenure arrangements are strong because there is a clear gap between the land register and the actual tenure situation (a gap between policy or planning, and practice). In a previous case, Neef et al. (2004) came to similar conclusions about the need for contextual understanding and flexibility in northern Thailand, while also highlighting political economy and market aspects of water resources.

Application of the water tenure concept in the literature, prior to Hodgson's (2016) definition, was mainly in terms of rights and customary tenure. Additionally, various understandings and uses of the water tenure concept points to the novelty of it, without a large body of literature establishing a well-informed definition and application over time. Building on Le's work (2023), this paper aims to elevate the level of analysis (not in terms of priority, but in terms of scope) to the river basin-scale through water governance analysis. By doing so, new contributions for understanding challenges of implementing water tenure in Vietnam may be provided while highlighting the importance of understanding water governance systems when looking at water tenure arrangements.

1.6.3 River basin organisations – context, functions, and designs

Huitema & Meijerink (2014) explores institutional design choices, tracing historical shifts of water governance and the emergence of RBOs. Building on Ostrom's (1990) ideal types, the authors establish a set of rules through which they analyse and evaluate the politics, design and impacts of RBOs. An important discussion is the politics of the introduction of the RBO as a new design for bioregional governance, which tends to come from actors motivated to change the current power dynamics according to their subjective preference. The improvements suggested by proponents of the bioregional governance approach through

RBOs are not considered neutral, but rather based on specific targets, objectives, and goals that make RBOs the most effective or efficient design. For example, throughout history, RBOs have been established for purposes of economic development, irrigation, hydropower, and ecology. Secondly, defining the boundaries of the basin implies choice, which is political, because drawing those boundaries decides who will do what and to which degree.

The history of RBOs underscores that they have been promoted to serve different aims Molle (2009). The model was originally associated with hydrological control and construction of grey infrastructure, like multipurpose dams, around the period between 1930 to 1970, later used to address water quality problems before becoming a pillar of IWRM in the context of watershed and ecosystem management methods. The strength of the RBO is its default alignment with natural flows and boundaries of the river basin, constituting an intuitive unit for water resources management. However, since political and administrative boundaries seldom correspond to basin boundaries, it has been used as a tool for discrediting political institutions for (perceived) poor performance. RBOs have been used as a symbol of power, accrediting development to the governing of the basin, and as models to justify repackaging of master plans for integrated basin management which differ little from those that existed previously. Finally, and directly linked Vietnam (see Molle & Hoanh, 2009, below), was the use of river basin approaches by ministries as a tool for claiming power and resources over others. Recent models have shifted into coordinating agencies, reconfigured, and adapted to accommodate decentralised systems and processes, and the diversity of actors and interests within them.

da Silveira & Richards (2013) examines specific implications of polycentric governance for river basin management on the Rhine River (European Union) and the Zhujiang (China), and implications for adaptive capacity. “Adaptive capacity is defined as the ability of a resource governance system to first alter processes and if required convert structural elements as response to experienced or expected changes in the societal or natural environment” (Pahl-Wostl, 2009: 355). da Silveira & Richards’ (2013) results suggests that the effect of polycentric governance systems on the adaptive capacity of social-ecological systems (SES) depends on power dynamics and functional linkages between decision-makers, competition, and collaboration over time. Conditions in China resemble Vietnam, particularly the overlapping decision-making competencies between two ministries with lacking information exchange, and high fiscal decentralisation of government spending to local levels while maintaining a centralised planning system (Du et al. 2016; World Bank, 2015; GoVN, 2024).

The seven largest Chinese cross-provincial river systems have River Basin Commissions. The 2002 Water Law in China promotes the dual management principle, meaning that “the action of one jurisdiction should not contradict the collective interest in the entire basin” (2013: 324). However, the commissions cannot enforce basin-level action because the provincial governments rank equally to central ministries, and they are not represented in the commissions. As a result, the commissions cannot solve cross-jurisdictional dilemmas or override provincial decisions, leaving the solution of those dilemmas to the concerned local governments.

Molle & Hoanh (2009) trace the history of RBO establishment in the Red River Basin. Failures of different projects aiming to implement IWRM principles and establish functioning RBOs are chiefly attributed to the divided state management function of water resources between the Ministry of Agriculture and Rural Development (MARD) and the Ministry of Natural Resources and Environment (MoNRE), established in 2002. These institutional issues are still relevant to a certain extent, as was highlighted by Le (2022; 2023). However, while some dynamics persist, the paper is dated, for example referencing the imminent demise of the 1998 Law on Water Resources (2009:11). The law, however, remains in effect, updated twice in 2012 and 2023, and considered the central law for water resources management (Le, 2022). While the authors identified strong over-enthusiasm regarding the expected success of these models following the projects, they correctly predicted that these attempts would incrementally influence policy development, because RBOs are still being prioritised 15 years later (NA, 2023).

2. Background and context

2.1 Water resources in Vietnam

Vietnam has generally good access to water resources, with over 3,450 rivers longer than 10 kilometres, a total annual inflow of 830–840 billion cubic metres, and an estimated annual rainfall of 2000 millimetres (IWRP & AMPERES, 2021; Tilleard et al., 2023; World Bank, 2019). Domestically generated runoff accounts for around 37 percent of the country's total surface water, while transboundary sources accounts for the remaining 63 percent (around 90 percent of the Mekong River and 39 percent of the Red River) (IWRP and AMPERES, 2021).

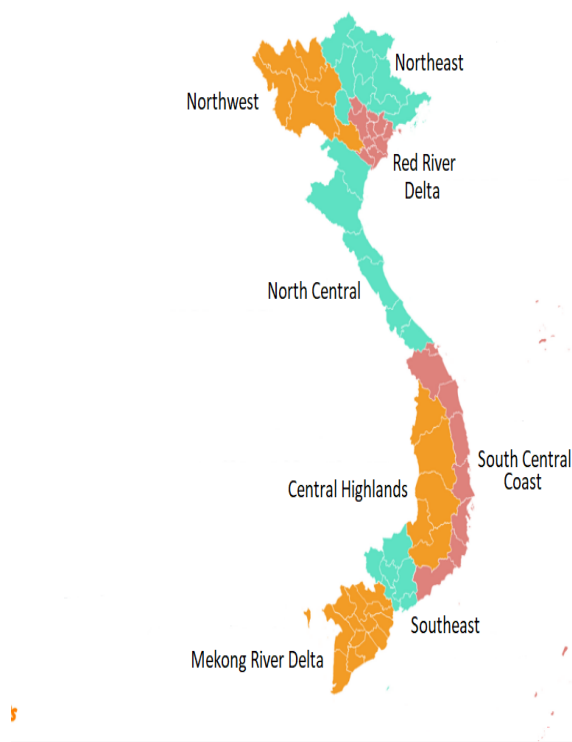


Figure 1: Regional Map of Vietnam adapted from OFOMaps (2022), (IWRP and AMPERES, 2021).

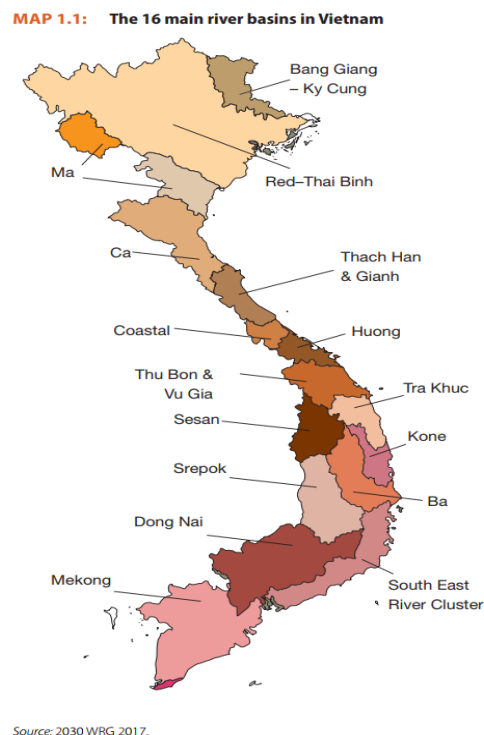


Figure 2: 16 major river basins in Vietnam (2030 Water Resources Group, 2017) (IWRP and AMPERES, 2021).

Surface and groundwater resources irrigate more than 4 million hectares (ha) of agricultural land (World Bank, 2019). A network of 7808 hydraulic structures stores and diverts water to thousands of irrigation schemes while generating power for Vietnam (IWRP & AMPERES, 2021; World Bank, 2019). 6750 of those are irrigation reservoirs, 466 are hydroelectric reservoirs, and 592 run-of river dams (ibid). Hydropower accounted for about 37 percent of electricity in 2018, with an installed generation capacity of about 17 gigawatts (GW), which the Government is planning to increase (World Bank, 2019).

	Too little water	Too variable water	Poor quality	Over-utilisation
Northeast			X	X
Northwest			X	X
Red River Delta			X	X
North Central		X	X	
South Central Coast	X		X	
Central Highlands	X		X	

Southeast			X	X
Mekong River Delta		X	X	X

Table 1. Regional water scarcity, Vietnam. Adapted from IWRP & AMPERES (2021).

Table 1 above illustrates where the different types of water scarcity are occurring according to the FAO-WSP categories. As Table 1 shows, poor water quality and over-utilisation are the two biggest problems on a national level, across climatic zones and ecological endowments.

2.2 Legal and institutional context

2.2.1 Relevant laws for water resources management

Article 53 of the Constitution of the Socialist Republic of Vietnam states that natural resources, including water resources, are “coming under ownership of the entire people represented and uniformly managed by the state” (NA, VN. Const., 2013). Related laws on the management and use of water resources in Vietnam are illustrated in Figure 3 (Le, 2023).



Figure 3. Laws relating to water resources management. *Source: Report on Water Tenure in Vietnam (Le, 2022).*

The two most central laws for water resources management in Vietnam are the Law on Water Resources (NA, 2023) and the Law on Hydraulic Works (NA, 2017)¹. A brief overview of these two will be provided below, with other relevant legislation in Annex 2.

The Law on Water Resources was updated in 2012 to implement IWRM principles and delegate responsibilities for key functions under the overall mandate of MoNRE (NA 2012; Le, 2022). The main provisions of the 2012 update were: 1) formalising requirements for assessments, strategy and planning for water resources development, 2) defining measures for protection and sustainability of water quality and quantity, 3) regulating water resources allocation and use, including protection of groundwater, and 4) providing financing for water resources management (World Bank, 2019). Implementation of the law (2012) is constrained due to challenges of data collection and sharing. Surveys and routine monitoring activities are limited due to strained budgets, causing fragmentation and planning difficulties (IWRP & AMPERES, 2021). As mentioned in the introduction, this law was updated again in 2023 to strengthen water security, protection of water resources, and mobilisation of investments through public-private partnerships (VLLF, 2023). The 2023 Law will take effect on July 1, 2024 (NA, 2023).

The Law on Hydraulic Works (also translated as *The Law on Irrigation*) issued 2017, complements the Law on Water Resources (NA 2017). The law specifies formulation of strategies, master planning, investment, construction and management of hydraulic works, irrigation and drainage services, and provisions for cost recovery and financing. The current subsidy system for irrigation and drainage services (from Government to Irrigation Management Companies (IMCs)) is changing into a pricing system, or Irrigation Service Pricing (ISP). The ISP will create a legal basis for collection of revenues from irrigation and drainage services for reinvestment. A goal of the ISP is to change perceptions of water in the irrigation and drainage system from a free service to an economic good (Le, 2022).

Pursuant to the approved laws in Vietnam, there are subordinated regulations in the form of decrees, circulars, and decisions, further detailing the responsibilities, mandates and other procedures on management, exploitation, and use (Le, 2022).

¹ This was concluded throughout the interviews.

2.2.2 Institutional arrangements for water resources management

At the central level, ten ministries involved in water governance, the two main ones being MARD and MoNRE (Le, 2022; IWRP & AMPERES, 2021).

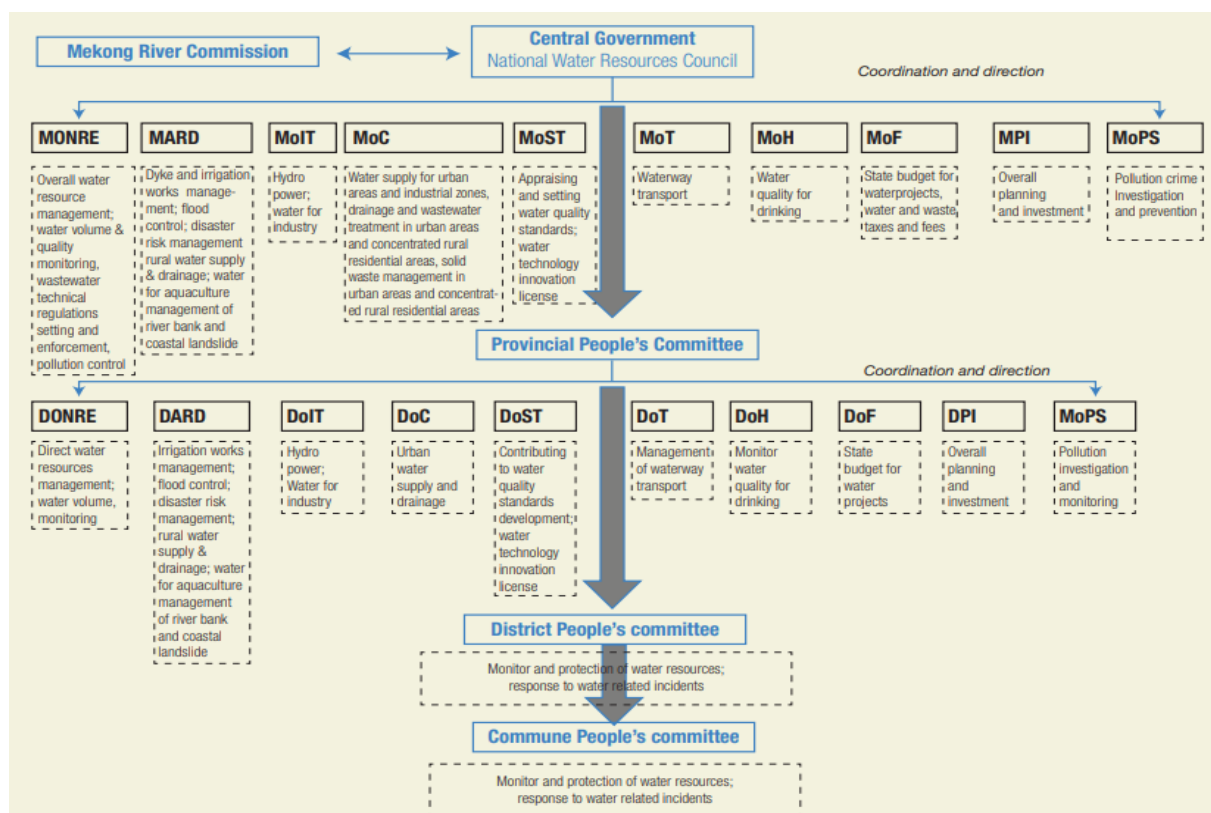


Figure 4: Institutional arrangements of Vietnam with corresponding mandates in water resources management. Source: 2030 WRG, 2017, as presented in the World Bank report (2019).

There are 63 provinces in Vietnam, five of which are centrally run municipalities (Hanoi, Ho Chi Minh City, Hai Phong, Da Nang, and Can Tho), but with similar autonomy and features as the other provinces (GoVN, 2024). At the provincial level, water resources are managed by the provincial People's Committee's (PPCs) while at the basin level, in terms of IWRM, water resources are supposed to be managed by RBOs according to the Law on Water Resources (Le, 2022). As the Figure 4 shows, there are provincial offices corresponding to the central ministries which carry out the respective mandates locally. At district and commune levels, District People's Committee (DPC), and the People's Committees of wards and communes perform their responsibilities over jurisdictions (ibid).

Provinces hold autonomy over the budget that they are allocated by the central government, and some autonomy to determine financial relationships between districts and communes under their jurisdiction but hold little autonomy over revenue policy (World Bank, 2015). A

National Water Resources Council (NWRC) exists to advise on complex matters, for example conflicts between provinces over water use (Tilleard et al. 2023). Provincial Steering Boards (PSBs) for Water Security are set up as temporary advisory bodies in certain provinces facing water security issues (Le, 2022).

In terms of operations, there are networks of Irrigation Management Companies (IMCs) responsible for irrigation and drainage services for agriculture across Vietnam. There are more than 900 irrigation systems which have been built with a capacity of over 200 hectares. Out of those, there are 122 medium and large irrigation systems with a capacity of over 2,000 ha that are managed and operated by IMCs. As of 2022, the country has around 97 IMCs, three of which are directly under MARD, and the remaining ones are under provincial control (Le, 2022). Provinces have separate operators for rural and urban water supply and sewage services. All operations institutions mentioned above are state-owned (ibid).

Different types of RBOs in Vietnam include: 1) River Basin Planning Management Boards (RBPMBs) organised under MARD, 2) River Basin Environment Protection Committees (RBEPCs) organised under MoNRE, and 3) River Basin Committees (RBCs) organised under MoNRE (Du et al. 2016).

Vietnam's political system contains elements of both unitary and federal governance systems. The central government in Vietnam holds significant power, particularly in matters of national defence, foreign affairs, and economic planning, but it has also decentralized certain administrative functions and devolved some decision-making authority to provincial and local governments (VLLF, 2017; GoVN, 2024; Du et al., 2016). Water allocation and infrastructure investments are examples where the provincial governments are autonomous and hold decision-making power (World Bank, 2019). Additionally, the mandate to manage water resources is divided between several different ministries and corresponding provincial, district, and commune departments (Le, 2022; Tilleard et al., 2023).

The water governance system in Vietnam can be interpreted as polycentric, as the law delegates power between several semi-autonomous decision-makers, different water use sectors and administrative levels of government. However, the presence of the polycentric system does not guarantee its functionality (Carlisle & Gruby, 2019).

3. Theory and analytical framework

3.1 Water as a Common-Pool Resource

This study is broadly based on Elinor Ostrom's work on commons governance theory (1990; 1994; 2010), specifically the polycentric governance model for governing common-pool resources (CPRs). CPRs are natural or human-made facilities (or stocks) that generate flows of usable resource units over time and have two core characteristics: "1) it is costly to develop institutions to exclude potential beneficiaries from them, and 2) the resource units extracted by one individual are not available to others" (Ostrom, 1994: 2).

Categorising water as a CPR is not new, but there are elements specific to water resources that warrant a brief discussion largely overlooked by the commons governance literature. By the definition of CPR, water use can be seen as non-exclusionary, for example small-scale sustenance use, or urban water supply services. But for water resources management at for example basin-scale, allocation priorities will affect water availability for other water use sectors, especially under increasing levels of scarcity (FAO, 2019). Additionally, pumping groundwater may also be exclusionary in scenarios where cones of depression overlap from two adjacent wells, causing well interference which reduces water availability for both (or causes no water at all for the shallower well) (Oregon State University, n. d.).

However, water use may be non-exclusionary if there are recoverable return flows. A simple example would be that a farmer irrigates their plot with more water than is consumed. The superfluous water then is either *non-recoverable*, as in polluted, sea flow, or other non-viable sink, or it is *recoverable*, providing more water volume for users downstream (Whiting et al. 2023). Therefore, in the use case of water resources, the second characteristic of the definition should be slightly modified from *extracted* to *consumed*, i.e. the resource units *consumed* by one individual are not available to others. For the purposes of this paper, water resources will be seen as an exclusionary resource because allocation to one use sector at basin-scale impacts water availability for others.

3.2 Polycentric governance theory

To govern CPRs, Ostrom (1990) suggests transcending dichotomies of state ownership versus private ownership, which were seen as the two viable pathways to sustainable natural resource management in Garrett Hardin's (1968) classic '*The Tragedy of the Commons*'. Ostrom promotes degrees of self-governance by local resource users and communities and outlines eight design principles that characterise CPRs (Ostrom, 1990; 1994).

Ostrom's eighth design principle, 'Nested Enterprises' is defined as "appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple layers of nested enterprises." (Ostrom, 1990: 101). The term 'nested' has at times been used synonymously with 'polycentric', but a nested governance system where decision-making power is not distributed between the involved actors cannot be seen as polycentric (Gruby & Basurto, 2014). Polycentric governance systems were first formulated by Vincent Ostrom et al., (1961) when observing that federal systems presented characteristics of polycentric decision-making system, as opposed to a monocentric system with one dominant centre of decision-making power. The central theoretical prediction is that a functional polycentric system improves capacity for learning and adapting to change (Huitema et al., 2009). Looking back to Castro's discussion on the definitions of water governance (subsection 1.6.1), Ostrom's definition of polycentric governance (1961) relates to a process of achieving certain goals.

Du et al. (2016) link decentralisation in Vietnam to polycentric governance, but do not explore the efficacy or limitations of water governance through the lens of polycentricity. Hoanh et al. (2014) investigates polycentric governance in irrigation policy development, indicating that a polycentric system exists, but the analysis is not conducted using a polycentric governance framework. Considering the polycentric features of the Vietnamese political system and recognition in previous research, it is relevant to use a rigorous polycentric lens to run a preliminary diagnostic attempting to explain the challenges of water governance in Vietnam, echoing the purpose of this paper.

3.3 The bioregional governance approach – an alternative

Managing water resources bioregionally, at basin-level boundaries, can avoid conflicting interests (Huitema et al., 2009). However, bioregional boundaries seldom correspond with political boundaries. To address that, a basin-corresponding political boundary can be created, either by endowing a new, unitary RBO with decision-making power, or by setting up a collaboration mechanism between existing administrative jurisdictions (Schlager & Blomquist, 2000). The bioregional and polycentric approaches are situated under the adaptive governance literature (ibid). Adaptive governance systems recognise "the need for flexibility in the governance structure to allow for ecosystem-based management and stewardship of dynamic landscapes and seascapes" (Boyd & Folke, 2011: 4). These approaches are not mutually exclusive or static, and they coincide, specifically when RBOs are set up as

collaboration mechanisms between existing institutions, which is also the most common type of river-basin management institution (Huitema et al., 2009).

3.4 Theoretical operationalisation of the polycentric governance model

The operationalised model of polycentric governance theory developed by Carlisle and Gruby (2019), focuses on characteristics for achieving the functions which scholars of polycentric governance predict (ibid). The model is derived from Vincent Ostrom's original formulation of the polycentric system (1961), turning that definition into two modified central attributes, with corresponding enabling conditions, and advantages.

Attribute	Enabling condition	Advantage: Adaptive capacity	Advantage: Good institutional fit	Advantage: Risk mitigation/r edundancy
(A1) Multiple, overlapping decision-making centres with some degree of autonomy		X	X	X
	(EC1) Decision-making centres employ diverse institutions	X	X	X
	(EC2) Decision-making centres exist at different levels and across political jurisdictions		X	X
	(EC3) The jurisdiction or scope of authority of decision-making centres is coterminous with the boundaries of the problem being addressed		X	
(A2) Choosing to act in ways that take account of others through processes of cooperation, competition, conflict, and conflict resolution		X	X	
	(EC4) Generally applicable rules and norms structure actions and behaviours within the system	X		
	(EC5) Decision-making centres participate in cross-scale linkages or other mechanisms for deliberation and learning	X	X	
	(EC6) Mechanisms for accountability exist within the governance system	X		

(EC7) A variety of formal and informal mechanisms for conflict resolution exist within the system	X
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Table 2. Theoretical model of a functional polycentric governance system for the commons (Carlisle & Gruby, 2019). Numbering added for ease of reference.

The attributes of the model help determine the *degree of polycentricity* of the system, whereas the enabling conditions determine the *degree of functionality* of the same (Carlisle & Gruby, 2018). Achieving a functional polycentric system through the fulfilment of the enabling conditions results in three predicted advantages of a polycentric governance literature (ibid). While attributes and enabling conditions are designated as corresponding to specific advantages, it is acknowledged that all attributes and conditions correspond to all advantages in varying degrees, and the advantages might be mutually reinforcing (2019).

Elements of institutional diversity, collaboration, conflict, and competition feature prominently in the analysis due to their centrality for the polycentric system and the material gathered for this thesis. This will guide the analysis through the formulation of thematic codes, described in the next section. There is a strong focus in the model on relationships, corresponding to the foundation of the definition of water tenure, making this framework useful considering both polycentricity and water tenure.

Researchers or decision-makers devising rules for improving governance outcomes can realistically undertake only partial analyses of an incomplete set of rules and their influence on outcomes in specific environments (Ostrom, 2005). Thus, the term social-ecological systems (SES), mentioned frequently in the literature, will be avoided (Ostrom, 2007; Huitema et al. 2009; da Silveira & Richards, 2013). Decision-making centres (DMCs) are actors that form or enforce institutions for water resources management in the polycentric system (Carlisle & Gruby, 2018). However, DMCs are not limited to those enforcing rules-in-use, since institutional designs and rules relevant to basin governance in Vietnam are being formed and reformed at the time of writing and may be relevant in different basins to varying degrees.

4. Research design

This thesis employs a case-study design, specifically Vietnam as an exemplifying case of a country facing water governance challenges under increasing water scarcity (Bryman, 2016). The duration of the research and writing period was spent in Hanoi, in regular interactions

with water professionals from government agencies, research centres, and academia. The data used in this paper comes from elite interviews conducted in English.

4.1 Material and data collection

The data collection method used for this paper is qualitative, semi-structured interviews, aimed at providing flexibility and space for follow-up questions (see Annex 3 for interview guides). Seven 45–60-minute interviews were conducted in-person, or over video call. The approach allowed for an in-depth understanding of the research topic as seen from various experts and policymakers working with different water resource functions. Partial translation support was required in one interview for clarifications on certain concepts. The interview guides were reviewed by associates at the IWRP. All but one of the interviews were recorded and transcribed.

The interviewees of this study were all Vietnamese nationals, from general and technical departments under the Ministry of Agriculture and Rural Development (MARD), the Ministry of Natural Resources and Environment (MoNRE), RBOs, and academia. In all cases, the interviewees had long experiences working in water management in Vietnam, and across different ministries and sectors (public, private, and academia). They were senior enough to have operational and political experience in the sector, and technical enough to understand the complexities of implementing solutions. Interviewing and attending events across several different ministries provided an opportunity for data triangulation and identifying interesting divergences between ministries which helped identify friction points in the governance system.

4.2 Data analysis

Data was analysed using thematic analysis (TA), with themes used synonymously with the codes for categorising the material (Bryman, 2016). Formulation and organisation of the themes follow the same logic as Carlisle and Gruby's (2018) study on fisheries governance in Palau. Firstly, themes are deductively derived from, or aligned to the attributes and enabling conditions of the operationalised theoretical framework (OTF). Secondly, as the thematic coding took form, room was left for newly emerging inductive themes during analysis of the material, allowing context-specific elements, theoretical contributions, and alternative explanations to emerge (Carlisle & Gruby, 2018). The thematic coding of the material was done manually in an offline self-developed coding document.

4.3 Scope and delimitations

The study focused on priority river basins in Vietnam due to their scale and availability of information on relatively nascent RBOs. Despite being a downstream country in several major transboundary river basins, this thesis avoids transnational issues of water management, and discussions on transnational elements will only be mentioned when they have an impact on the context and themes of this study. However, we can still learn from transboundary issues domestically, specifically across sectoral and provincial boundaries (SIWI, 2023). These transboundary elements are highly relevant in Vietnam due to the division of the water mandate, and the relatively autonomous provinces which carry decision-making power regarding issues of water resources management (World Bank, 2019).

The DMCs analysed are not exhaustive for the river basin governance systems in Vietnam, but they were the most frequently mentioned DMCs in the interviews and the most relevant for answering the research questions within the limited scope of this thesis.

4.4 Discussion on the design

The qualitative, single-case study with the interview method is warranted because of the lack of in-depth studies that seek to suggest explanations for the implementation gaps of water resources management policy. This paper makes use of existing comprehensive descriptive literature (Du et al. 2016; World Bank, 2019; Tilleard et al. 2023; IWRP & AMPERES, 2021) as the background to explain the limitations and challenges identified.

4.4.1 Positionality

The focus on understanding the research problem through adaptive governance models came from their suitability for understanding decentralised governance of CPRs and reference in previous research on water governance in Vietnam (Du et al., 2016; Hoanh et al. 2014).

Despite having experience from working in the water governance space in Vietnam, there were no preconceived or desirable outcomes besides finding possible explanations to governance challenges by applying a rigorous theoretical model. The researcher's familiarity with the interviewees, topic, and technical nomenclature is considered to have reduced the risk of imposing the interviewers external frame of reference on the interviewees. However, in some cases new and unfamiliar concepts were introduced relating to water tenure, in which case each concept was explained.

4.4.2 Case selection and level of analysis

Most RBOs in Vietnam are in early stages of development, and the ones that have been around longer do not have the capacity or scale to serve as useful single cases of functioning RBOs. Therefore, the study pivoted toward a national focus on river basin governance, inductively selecting trans-provincial basins with enough activity to substantiate the research (see Figure 2 in section 2.1 for map references):

- Red River basin (Luu vực sông Hồng),
- Vu Gia – Thu Bon River basin (Luu vực sông Vu Gia – Thu Bồn)
- Sesan-Srepok River basin (Luu vực sông Sê San – Srêpôk) (2S)²,
- Mekong River basin (Luu vực sông Cửu Long).

The initial ambition of this thesis was to study a single river basin, local communities, and *actual* water users (as opposed to just sanctioned, or general water use sectors), to complement the limitations imposed on Dr Le Van Chinh by Covid-19 travel restrictions. This would have enabled the use of other types of theories that may be more sensitive to resource access, benefits, and self-organisation of local water users and communities. More resources, time, and series of interviews with the same interviewees might have made a single RBO case study more feasible.

4.4.3 Limitations

Incomplete representation of all water users along the river basins is a limitation of this paper. Extended field trips were not possible due to limited financial resources and time. As English proficiency tends to decrease outside of larger cities, this would have required translation support and additional travel expenses, due to the researcher's limited capacity in the Vietnamese language. This removed the possibility to interview local actors that are not in the orbit of the capital (if in the RRB) or in different regions (other river basins), such as rural water user associations (WUAs), irrigation management companies (IMCs), and small-scale water users such as households or farmers. Water tenure was retained in the thesis with partial focus nonetheless, due to its flexibility, even though understanding of actual water use and relationships outside of the delimited decision-making sphere would necessitate rural fieldwork.

² The 2S River basin is also referred to as the 3S (including the Sekong River). However, it will be referred to as 2S because that was how it was referred to by interviewees of this study.

It may be noted that civil society organisations (CSOs) have not been included. CSOs as they have been conceived in liberal democratic contexts and applied in Vietnam through the international development community are not salient, and the term ‘civil society’ is not formally recognised (Vu & Le, 2023). Therefore, the opportunity to draw on that type of information was constrained. Influential mass organisations, for example the Vietnam Labour Confederation (VLC), are generally organised under the Vietnam Fatherland Front (VFF) which is itself aligned to the Communist Party of Vietnam (CPV) (GoVN, 2024). Civil society is not actively involved in water resources management (IWRP & AMPERES, 2021).

4.5 Ethical considerations

The study adheres to Vetenskapsrådets (Swedish Research Council’s) *Good Research Practice* (2017). A paragraph of informed consent was provided to interviewees, following a description of the project and the intended use of the generated information, either over e-mail or via Zalo.³ All information was handled confidentially, stored safely, and respondents were anonymised. The links between interviewee reference numbers and quotes in the analysis are only known by the author and the respective interviewee. The research topic and information on data handling was repeated verbally at the start of each interview.

Domestic water governance in Vietnam is not considered to be a sensitive topic, but norms regarding information sharing on specific issues may cause some apprehension among interviewees. The interviewees were never pressured to answer the questions of the interview guides, and all the questions were, as previously mentioned, reviewed by IWRP.

5. Analysis

The subsections below correspond with the attributes (marked A1 or A2) and the enabling conditions (marked EC1-EC7) of the OTF outlined in the third section. Headings without specific reference to the OTF were formulated inductively after working through the interview transcripts, keeping the central elements of the theory in mind. Finally, the information will be reintegrated to full OTF. All information is drawn from the interviews. Inclusion of other types of information is included for triangulation purposes and referenced.

³ Ubiquitous communications application in Vietnam.

5.1 Decision-Making Centres and their autonomy (A1)

The autonomy of ministries and government authorities in relation to each other has been described in subsection 2.2 on legal and institutional frameworks, and in the third section. This subsection will discuss the other types of Decision-Making Centres (DMCs) that are relevant to river basin governance in Vietnam.

The Vietnam National Mekong Committee (VNMC), an inter-ministerial committee headed by MoNRE, established two sub-committees for river basin management in 2021 – one for the 2S and the other for Mekong River. The institutional arrangements were formulated in Decision 07/QĐ-UBMC (2021) and Decision 08/QĐ-UBMC (2021) by MoNRE. The Prime Minister's office designated RBO status to the VNMC in 2023, aligning it with the 2023 Law on Water Resources (LWR). Since the 2023 law is new, as well as the VNMC RBO-designation, there has not been enough time yet for MoNRE to develop the implementing regulations, for example a circular which could provide more details regarding the decision-making power of VNMC. Currently, the VNMC is part of the decision-making *process*, but there is no real requirement for other stakeholders, for example provincial governments, to adhere to their consultation or opinion. Additionally, the *overlap* of functions between VNMC and other types of regional committees is often rooted in the autonomy and self-governance of provinces. The degree to which VNMC will enjoy independence to make norms and rules for water management regulation on the 2S and Mekong River is dependent on the operationalisation of their RBO status 2023 LWR by MoNRE through implementing regulations, such as ministry circulars. As a ministry officer remarked:

“So now, the two current sub-basin RBOs mentioned in the [2S River and Mekong River], they don't have a real meaning of RBO as understood by [the] international community yet, because it lacks power with working with the provinces, and they do not have any legal obligations for their decision yet.” (Interviewee 4).

The Red River Basin Organisation (RRBO) has existed for over twenty years and is organised under MARD through Decision No. 39/2001/QĐ-BNN (2001), and had a quite tumultuous inception (Molle & Hoanh, 2009). Today, the procedures and tasks of the RRBO revolves around conducting consultations and meetings on water use and river basin management for provincial representatives. However, there are currently no requirements on the ministries or provinces to adhere to information that is shared or recommendations that are provided,

leaving the RRBO in a similar position as the VNMC – autonomous by law, but without decision-making power. The autonomy of these institutions is compared to other contexts by several interviewees:

“You have some countries, for example Indonesia, or countries in Africa where RBOs are very important. And they can [...] manage many things in the river basin. Even in the water planning or the construction, anything related to water use in the basin. But in Vietnam it is only the Government’s organisations that have the important roles in the decision-making.” (Interviewee 7).

Another challenge for the of RBOs as DMCs is that their relative autonomy is challenged by other DMC’s wanting to be independent from various committees and controls, especially those that only function as meeting platforms, such as the RBO hitherto. This reluctance is based, to a degree, on the rejection, or scepticism, of the RBO-model in the Vietnam context by decision-makers because it has not proven to be an effective institutional design yet.

5.1.1 Diversity of Institutions (EC1)

Diversity of institutions, understood as the “variety of written and unwritten rules, norms, and strategies in a particular domain” (Carlisle & Ruby, 2018: 228), gets quite complex on a river basin scale in Vietnam, due to the multiplicity of DMCs (ministries, provinces, departments, operators) that manage water resources through specific institutions and relationships.

Diversity in the water governance system mainly comes from the different ministries holding different but often overlapping mandates. Beside various laws, the interviews highlighted some key institutions and norms, described below.

Irrigation Service Pricing (ISP), is included in the 2017 Law on Hydraulic Works, representing a shift from the subsidies to irrigation water users through irrigation management companies (IMCs) . An interviewee who participated in the operationalisation of this regulation highlighted that ISP mechanisms may reasonably strengthen the relationships between irrigation water users, IMCs, and the provincial governments. Since the subsidies now flow from the Government directly to the IMCs, there are virtually no links or obligations between water user organisations (WUOs), or farmers, and the operators and regulators, contributing to low awareness and a sense of abundance of ‘free water’ for the end-user. ISP is expected to increase awareness and to more revenue from water management which can be reinvested to maintain and improve infrastructure and services. The pricing level does not differentiate between water-scarce and abundant areas (classifications which

also change seasonally), overlooking an important incentive for water saving and potential re-allocation (IWRP & AMPERES, 2021; Interview 4).

A key challenge which was highlighted by interviewees is that of timing and pace. The provinces are asked to change, but they may not be as quick as the central government, and perhaps even reluctant. This means that innovation and ability to test the functionality of new models is inhibited. Interviewees acknowledged that considerations need to be made regarding the effects on the ISP on low-income farmers.

Water use licensing is generally managed by MoNRE. Using water for irrigation is fully subsidized in Vietnam. However, if a specific request for water exploration is large enough, it must be registered. If it is so large that it potentially impacts irrigation systems, it requires a license for clearance by MoNRE or the PPCs according to the Law on Hydraulic Works (Article 58). The 6750 irrigation reservoirs are technically subject to the license requirement (including new structures being built). The process can be costly for the IMCs that manage the reservoirs, both in terms of money and time, and their budgets are already strained.

Inter-reservoir operation rules, or *operation rules* for a reservoir, are mentioned as a central foundation on which decisions on delivery and release schedules from hydropower reservoirs are made, with respect to the minimum flows set by MoNRE (Dang et al., 2022). The rules exist in 13 of the largest river basins in Vietnam, and within specific irrigation systems, setting different purposes and objectives for different sectors over time. Developing these rules is a consultative process involving several stakeholders from national and local levels, including operators. MoNRE is responsible for formalising these rules, but, for example, Vietnam Electricity (EVN) (state-owned power company under MoIT) can have high influence on formulation of certain rules on account of owning and operating hydropower reservoirs. Some interviewees indicated that a functioning RBO, supported by an effective decision-support system (DSS), could harmonise conflicts regarding operation rules and allow for more, and quicker, adaptation to changes in water availability or demand.

Seasonal adjustments to water allocation and decision-making will occur. For example, during dry season, MARD will require more water to be released from the dams operated by EVN (managed by MoIT), even though it may be impacting revenues from electricity supply. Conversely, during wet season, EVN may release less, due to flood control and because it is not needed as much for downstream purposes.

5.1.2 Levels and jurisdictions (EC2)

Decision-making occurs at central ministries, and Provincial People's Committee's (PPCs) at provincial level, but more rarely across jurisdictions for dealing with transboundary issues between provinces and sectors (NA, 2023). A notable example of inter-provincial agreements that emerged is the collaboration on the Vu Gia – Thu Bon River (VGTB) between the People's Committees of Quang Nam Province and Da Nang City. The agreement was struck bilaterally, without central influence, as Da Nang was experiencing severe scarcity and Quang Nam wanted to reallocate water. On paper, NWRC should resolve conflicts between provinces where they are unable to come to agreements but judging from the interviews and complications around its inception, their role is quite inconspicuous (Molle & Hoanh, 2009).

5.1.3 Alignment with boundaries (EC3)

The DMCs do not always have decision-making capability over the water resources in Vietnam because generation of water flow occurs outside the national boundary in several cases. In the Mekong River for example, we may recall that around 90 percent of the flow originates from outside the country and out of reach for Vietnamese DMCs.

5.1.4 Decision-making capacity of DMCs

This is the first inductively produced theme of the analysis and has been included due to the centrality of financial, human resource, and political capacity for effective decision-making in the context of water governance in Vietnam. As one interviewee put it, the legal frameworks are strong and plenty, but “the most important is the shortage of the ‘capacity for management’” (Interviewee 2). This refers to the actual capacity of those responsible according to law for carrying out their mandate and their responsibilities. The de-jure normative empowerment of RBOs may exist and is formally recognised within the system, but it does not mean that the RBO have de-facto power to carry out their mandate. To give an example, VNMC has been formally assigned the RBO role, but they do not receive enough budget allocation or human resources to carry it out yet, as remarked by an officer of a department:

“[...] they [MoNRE] assign for VNMC their mandate as the RBO, but they don't give any further resource to implement that one” (Interviewee 6).

As another interviewee commented:

“[...] if a province planned a project, for example that will use water, or that will affect the water resource, they will send some information to request [VNMCs] comments for example, and then we get the recommendations and the comments and then they will be the ones that decide whether that project will go ahead or not. And I think that this is also one of the barriers [...], because we as an RBO do not directly control what is happening in the river basin itself [...] so the final decision rests outside of the RBO scope.” (Interviewee 5).

For the RRBO, representation has been considered strong. 25 provinces in the basin have been represented by both the PPCs chair and the leaders of the provincial Departments of Agriculture and Rural Development (DARDs), including representatives from relevant ministries. Recently however, the provincial members of the RRBO are only represented by the DARD leaders, and MARD is the only ministry represented from the central level. This implies a limited reach in terms of influence. Secondly, and this does not only relate to the RRBO, the actual operations and implementation of the RBO function is limited because the responsibility of the RBO staff are currently added to their job descriptions, leaving little time for the officers to carry out RBO-related tasks.

“I think by law its already solved, by law. But in implementation it’s not ready. So, it requires a lot of resource in terms of human resource, capital resource and cooperations between different sectors. But you know, we have, with most of the things in terms of the law, most of the things is done already.” (Interviewee 6).

5.2 Cooperation between DMCs (A2)

Considering the division of the state management function for water resources management in Vietnam, cooperation is required for its governance and is enshrined in law. However, in practice, cooperation is limited, and issues persists on national, interprovincial, and provincial level. At basin-level, priorities within provincial jurisdictions normally takes precedence and provincial autonomy is emphasised. Additionally, limited collaboration between provincial government departments within provincial boundaries was also underscored, reflecting the limited ministerial cooperation regarding overlapping mandates at national level. As pointed to by a professional with management and academic experience:

“[...] even within one province, the discussion of the agreements between DARD, which is responsible for the irrigation and drainage system, and DONRE, sometimes they don’t have type of close relationship. [...] I have field investigation in [a

Northern province in the RRB], [...] they say that water resource planning have no close connection between irrigation and drainage planning.” (Interviewee 1).

This implies further fragmentation and cooperation challenges between interdependent DMCs, mirroring the reluctance for transparency and information sharing seen at national level. There are also differences in the boundaries referred to by different laws and plans that cause issues for harmonisation between river basin planning and provincial water resource planning, as highlighted by the same person:

“From the beginning there should be river basin planning. Then connected and based on other water use, like irrigation and drainage. But actually, I found that there is a very limited connection between the river basin planning and the provincial water resource planning. [...] In Vietnam we have 14 or 13 large river basins. But at the time [2020-2021], only 2 or 3 had the masterplan approved by the Prime Minister” (Interviewee 1).

Integration of plans at different scales is lacking, and there are few basin master plans to refer to. The 2017 Law on Planning requires sector or subsector planning to align under the socioeconomic master plan (implying water resources planning as well). But the water sector refers to the basin as geographic boundary, whereas other sectors refer to regions, specifically ecological or economic regions, and the limited overlap of the boundaries defined and used for these plans causes weak collaboration. Another issue related to planning is that different plans for water resource management at different levels are created by different agencies, and information sharing between ministries and agencies is limited. On that, an official commented:

“So, they decide by each sector, they have their own development strategy, own planning, and they try to do the planning, and whenever the planning is required to consult with different sectors they will do it, but mainly by sector.” (Interviewee 6).

The need for a functional cooperation platform is highlighted throughout the interviews. RBOs are seen as an alternative for resolving issues of limited inter-ministerial cooperation and deliberation. Secondly, the RBO could align priorities across a range of social, economic, and environmental targets, making water allocation more equal. MARD must consider the supply of water for agriculture, rural populations, and disaster risk management. MoNRE on the other hand, is concerned with minimum flow (leaving enough water in the river for

environmental purposes) and applying water standards. So, there might be differing views of the urgency of different water use purposes, which shared goals under an RBO *may* be able to conjoin.

Operation rules and seasonal adjustments mentioned under 5.1.1 simultaneously function as platforms for collaboration, since the process itself is participatory among DMCs, although the final decision rests with MoNRE.

5.2.1 Rule and norm-based behaviour within the system (EC4)

There is a strong adherence and reference to the laws regulating water resource use among all interviewees, highlighting an awareness of rules. However, that awareness is difficult to translate into practice in the Vietnamese context.

In terms of water allocation at basin-level, or within an irrigation system, procedures were identified as lacking. On the basin-level, there is room for improvement in terms of formulating formal procedures for determining volumes and levels of water allocation, as mentioned by law. At the reservoir-level, assuming a multi-purpose reservoir for irrigation, hydropower, flood control, and so on, the allocation should be approved by the DoNRE. This formal procedure has been lacking in cases known to the interviewees.

As pressures of water scarcity grow in Vietnam, more focus is directed towards reducing non-volumetric scarcity by improving water quality. Shifting focus towards water standards indicates a transition from a quantity-focus concerned with water use for development, toward sustainable management of the resource as competition and environmental concerns are growing. This implies new rules and norms in relation to water management which must be reflected appropriately in legal instruments, according to an interviewee.

The cooperation relating to seasonal adjustments between MARD and MoIT, allowing for varying degrees of power relinquishment, temporarily but regularly, is an example for norm-based behaviour within the system.

5.2.2 Cross-scale linkages and mechanisms for deliberation and learning (EC5)

The combining groups within ministries that are responsible for drafting new laws will regularly consult at different levels for feedback. Within the combining groups for drafting the law, representatives from ministries will be included for cross-ministerial deliberation and learning. Subject to agreement by members, the draft is sent to provinces which collect comments from district and commune level. However, “the end water users have very little

chance to contribute their comments or their idea, like the farmer or the household” (Interviewee 1). The responsible ministry would normally publish the draft law online for public consultation. But the technical and legal knowledge of, for example a rural small-scale water user, is not sufficient to critically examine a legal document. To resolve this, the National Assembly has suggested, according to an interviewee, that the provinces or districts should have local representatives conduct meetings to explain the changes and collect feedback.

A critical issue identified that challenges collaboration, deliberation and cross-scale linkages is the lack of cooperation regarding monitoring and data sharing. There are no harmonised, single decision-support system (DSS) combining, for example, reservoir systems, river systems, early warning, and flow modelling. As of now, different DSS exist for different purposes, over different scales and in different places, but do not come together into a single foundation of support for basin-scale decision-making. For example, one government official commented on how a DSS may focus on mitigating impacts of a particular type of disaster, with each ministry having a different system, rather than an RBO-wide system like in other countries (Interviewee 4).

According to the 2023 Law on Water Resources, the RBO is mandated to monitor water use and activities relating to protection, coordination, and distribution. But, as an interviewee underscores, there is no systematic, centralised data collection and management system. The provinces themselves have their monitoring stations within their own boundaries, and certain water users, for example industries or dam operators, have monitoring systems for quantity and quality for their own use. In addition, central level ministries and authorities also run monitoring stations, according to an official:

“And so far, it’s very difficult to get all of this together, to have like a platform for open sharing [...], especially for the Mekong Delta water quality, so we set about issue on saltwater intrusion, but the data is very limited because we don’t have access to all the monitoring data. So, we also try to work with the different actors to, you know, combine the data and, you know, get to them in one platform so that they can be used in systematic way. This is the effort that has been actually ongoing [...], but for RBO I think this is essential for decision making support, if you want good decision making you need to have all available information.” (Interviewee 5).

To get these systems to work predictably in an RBO-setting, the interviewee expanded:

“So, this kind of thing actually require a technical framework in terms of a system itself and manpower and funding to maintain [...]. That cost money, yeah. It is not going to be for free. So, we come back at the first issue without, you know, proper funding, how are we going to effectively [...] implement the RBO function.”

(Interviewee 5).

5.3 Competition between DMCs (A2)

The competition element of the second attribute has been divided inductively between types of competition that emerged during data analysis.

5.3.1 Human and financial resource-based

There is a reluctance among decision-makers to release the mandate to make rules and decisions, because it would likely entail a budget reallocation if the RBO assumes certain responsibilities, particularly if RBOs are designated as unified entities. Furthermore, costs of establishing new authorities were mentioned, and those would be implied regardless of the RBO-type. However, in the interviews, options to make use of existing institutions and mechanisms of inter-provincial collaboration, like the VGTB case, emerged as well. This links to a goal of the central government to reduce the number of public agencies. But the financing issue remains, and even though the central leadership has approved the establishment of RBOs, there needs to be clarity as to how the institution will run, according to an involved official:

“And I think also one of the let’s say principles now is that we do not make new organisations, to take the responsibility, we will essentially give the responsibility of RBO to existing organisation. And without additional funding or you know manpower, that would be a huge challenge to effectively implement the RBO mandate. [...] in addition to the existing workload and I think that would be a very difficult thing if you want to do it efficiently.” (Interviewee 5).

5.3.2 Influence-based

In one of the interviews, national projects focusing on issues relating to water resources management were mentioned, one being on water security policies. This was assigned by the National Assembly to MARD at the time, while MoNRE considered it to be under their mandate, which caused disagreements regarding project implementation. This was escalated to higher levels of Government to issue decisions, which took about a year. It is now proceeding, but slowly.

For the RRBO, provinces do not see the benefit of the RBO in its current state, reinforcing the RRBOs limited capacity to influence decision-making (Interviewee 1). The meetings and consultations that the RRBO holds also suffer from this fact, reducing dialogue and deliberation because there is no direct benefit to the province. Sand mining in the RRB was highlighted as a concrete issue, yielding economic benefits to a province but having negative basin-wide implications. An RBO with influence could in that case have capacity to harmonise economic priorities with environmental and social needs at the basin level.

5.3.3 Allocation-based

While water availability in interprovincial basins varies, generally, there will be competition between different water use sectors based on lack of allocation plans and arrangements. When water needs are growing for certain sectors, like industry and tourism, and urban freshwater demand persists and increases, there will be new allocation-based conflicts, according to an official:

“For example, they have a reservoir here [pointing to the table] [...], but you don’t have an allocation system to different water use, that’s why you have to share the same water source, from the reservoir to the water use here. And its better if you have some control and something in the system, but now in Vietnam we don’t have that. [...] I think it’s better if the RBO have responsibilities to [do] that.” (Interviewee 7).

5.4 Conflict between DMCs (A2)

The conflict between DMCs in the RRB is considered low due to relative availability of water and seasonal adjustments to release schedules by reservoirs. However, conflict is greater in the 2S and the Mekong River. There is more volumetric scarcity in Central Vietnam, and hydropower is dominant, causing conflicts between urban centres and agriculture sectors. In the Mekong Delta, reduced flow and salinisation are key drivers of scarcity. Enhanced conflict over the water resources increases the risk of conflict between the DMCs.

5.4.1 In policy and law

The issues of collaboration in terms of planning overlap with the theme of conflicts, as the absence of one implies the presence of the other when sharing a resource. An interviewee highlighted that there is a disconnect between the frequency of which provincial planning and river basin planning are updated. Normally, provincial planning occurs more frequently, every three to five years, whereas river basin planning cannot be updated as frequently due to

limited resources. The provincial level planning relates specifically to provincial concerns in, for example, irrigation and drainage, which is separated from other, but interdependent, areas of water resources management.

In theory, the policies, laws, and regulations should be integrated and harmonised. But issues persist in terms of harmonising the conflicts between different DMCs managing different aspects of water use, according to an official:

“So, there are different, at the provincial level let’s say, different departments manage different aspects of the use. So, there has been effort to actually coordinate all these things, so through you know, master plans, through you know different kind of mechanisms like committees and so on, but in fact, in reality, its actually managed quite separately.” (Interviewee 5).

Integrated policy approaches to water resource management, specifically IWRM, although recognised in law and linked with RBOs, have had a difficult time getting traction. IWRM is still new to the legislators and leadership, and technical departments tasked to implement activities lack clear practical examples implementation, and sufficient funding. The basic view of water as a resource to extract for development is still pervasive, according to an official:

“The main purpose of water use, I think is for development. [...] But recently, I think I open my mind and I think it is for the whole thing, not just agriculture, but in Vietnam agriculture is the main part and the biggest consumer of water. [...] Up to now, I think, by theory it [policy landscape] should be integrated. But in reality, small part is integrated and they work as independent. But now, the Government they try to develop the policy, the system in order to manage the water in terms of integrated water management. But they are in very beginning step.” (Interviewee 6).

5.4.2 Intersectoral

Interministerial conflict based on divided mandates is sort of old news. However, in terms of the application of new institutions, such as the water use licensing for irrigation service providers (IMCs), new friction points emerge. As one interviewee commented: “the implementation, and the relationship between the stakeholder with regards to water resource, that is the problem.” (Interviewee 1). The argument from the IMC against registering and paying for a license could be that they already are a public company, providing public

benefits for farmers, without profits. But the responsible department for licensing under MoNRE would argue for licensing in terms of following the law, registering, and monitoring use, and providing basin-wide benefits.

Efforts to map and monitor use are essential to move toward more responsible use and management of water resources. Formalising and mapping water use by issuing licenses would help to mitigate issues of assumed water tenure by service providers in state operated irrigation systems. Conflicts between DMCs responsible for issuing and registering licenses, and the DMCs responsible for applying and abiding by them, slows down an already complicated process of formalisation, having potential impacts on the security of tenure by extension. The resulting lack of insight by DMCs managing water resources could be improved by water accounting systems on rivers, irrigation systems, or basins, which would also have benefits for water tenure arrangement formalisation toward sustainable use and management where conflict and competition exists.

Conflicts also arise during periods of seasonal adjustments. An interviewee recalled instances where, ahead of the spring cropping season, MARD and MoIT were supposed to come to an agreement on water allocation and release from the Hoa Binh reservoir (in the RRB) requiring approval by MoNRE. But due to heavy workloads and difficulties to organise meetings to agree and approve, decisions were delayed, impacting allocation timings, resulting in hurried responses by all DMCs. The delay was highlighted by an interviewee as a lack of procedural arrangements:

“But one of the things is that their reactions and response is not quick enough, because it may take weeks or even months for them to arrange this kind of meeting, because they have a lot of other duties. [...], so it’s not only about the attitude, but also the procedures. So, it could be many factors affect these kind of dialogues. But in my opinion, [...] they have to set up the procedure [...]” (Interviewee 1).

Another interviewee echoed the same issue, linking it to exacerbated water scarcity:

“We have some gap between flood season moving to the dry season, the timing is not good, and water is not coming right on time, missing one month and that make scarcity in Vietnam.” (Interviewee 4).

Due to historical factors relating a large mandate transfer from MARD to MoNRE upon its establishment in 2002, a lot of technical capacity remained within MARD, since technical

departments were not transferred along with the mandate, and they retained control of hydraulic infrastructure, rural water supply and disaster risk management. That has implications for conflict, because capable DMCs lost capacity for decision-making in their technical area, while other DMCs gained decision-making power, but did not initially match the previous mandate holder in terms of capacity. An interviewee highlighted that it is not complex by nature, but it has become complex by institutional design (Interviewee 3). Everyone wants to protect their mandate and their power to influence:

“But in Vietnam, [...], conflict, most conflict is not [among] water user – but in the management.” (Interviewee 7).

5.4.3 Sociocultural

Conflicts between DMCs also arise because of customs, culture, and preexisting institutions. An interviewee shared a story from when they were a young engineer in the water sector carrying out a development project. The team of engineers were eager to follow principles of Water User Organisations (WUOs) which were based on hydraulic boundaries, not traditional administrative ones. However, the project failed and did not sustain beyond completion. Upon evaluation, they recognised that they had overlooked the traditional customs and systems that had guided the behaviour of the users in relation to water resources for over a century. The lesson provided valuable insights to the interviewee in terms of application of new models:

“RBO could be good way, but it could be modified to follow the Vietnamese customs. But how? I think it is interesting topic and I will come back again when I have some time.” (Interviewee 1).

The RBO model is also mentioned in terms of its academic popularity, but that it does not guarantee effective implementation in the context of Vietnam. The models, so far, have in one interviewee’s point of view been copies of successful models in countries with different governance structures and institutions (Interviewee 3). Another interviewee said that the RBO-model is a way to fit with international norms and align the Vietnamese institutions to management boards of transboundary (transnational) river systems, but without extending actual decision-making capacity to the RBO (Interviewee 7).

The design of the RBO has, according to an interviewee, not been detailed enough or shaped to the political and institutional context of Vietnam:

“So, we have two way: One is to copy from somewhere, and we can change the structure, or the other way, we can modify the model to fit with what we have. So which way it easier? I think we cannot, you know, we cannot change. Or if we have to change it, it take half a century. So, the model should be modified in order to fit in our conditions.” (Interviewee 6).

5.5 Conflict resolution (A2)

MoNRE is currently developing a water outlook scenario for 2025, projecting conflict risks and gaps during dry and wet seasons in the coming year. This outlook considers the seasonal adjustments regarding priority sectors over the course of the year. While this technically not a mechanism for resolution, it could have a mitigating effect while providing a framework for conflict resolution.

Conflict resolution at basin level is formally supposed to take place with the NWRC, but was not mentioned by the interviewees, except for one, where the impact or activity from that council was questioned. The example of inter-provincial conflict resolution in the VGTB river is the central example of DMCs negotiating agreements bilaterally.

5.5.1 Accountability mechanisms (EC6)

There are few avenues of holding DMCs accountable in Vietnam, either by water users or between DMCs, unless measures are coming from higher levels of government. This was noted by Carlisle and Ruby (2019) in case studies of polycentric governance in systems where multiple DMCs hold the same or similar responsibilities. The interviews with different stakeholders for this study indicate a similar condition, where accountability is placed on different actors depending on who responds. This is unlikely to be true in all cases of conflict and accountability, and there may be internal mechanisms which were not mentioned in the interviews to this study.

Accountability systems require oversight and monitoring capacity. This is lacking but remains a priority for responsible ministries. Efforts to establish functioning and accurate water accounting systems in Vietnam on different levels is carried out simultaneously by MARD and MoNRE, in a somewhat fragmented fashion between different projects. However, when successful, such systems would improve capacity for (and be dependent on) information sharing, improving transparency of water use between DMCs.

5.5.2 Formal and informal mechanisms for conflict resolution (EC7)

Normally, when conflict occurs between provinces within a river basin, the provinces themselves are responsible for solving them. Similarly, when MoNRE is making river basin plans, listing the function of the river and use activities, provinces may disagree and require other use-cases based on their provincial plan. At present, the conflict resolution happens between the concerned parties' case-by-case, or ad-hoc taskforces are established between DMCs. An RBO could help in this process, according to an official:

“Because without an RBO, actually, the province itself they will have to manage to get information to you know make dialogue with [...] people upstream for example, they still have to do it because it affects them directly, but with RBO they will have a proper mechanism to do it.” (Interviewee 5).

5.6 Reintegrating results into the operationalised theoretical framework

Table 3 below reintegrates the themes into the full OTF, reflecting all the attributes of polycentricity and the enabling conditions for functionality. Table 4 in the next subsection evaluates to which degrees the advantages of the model are fulfilled. These tables are inspired by Carlisle & Gruby (2019; 2018), with minor changes to the order. The degrees to which the criteria can be fulfilled are **present**, **partial**, or **absent**.

<u>Attributes (A)</u>	<u>Presence in the River Basin governance system</u>
A1: Multiple, overlapping DMCs with some degree of autonomy	Present: Formally, there are over seven DMCs participating in forming and enforcing rules, and some naturally increase in number depending on the basin (PPCs, DARDs, DoNREs, and so on). Most carry overlapping responsibilities and are semi-autonomous. A general concern for this attribute is the enforcement capacity of certain DMCs.
A2: Choosing to act in ways that take account of others through processes of cooperation, competition, conflict, and conflict resolution	Partial: The four processes are present to varying degrees, but cooperation is limited in key areas, such as information-sharing. Competition occurs without any beneficial self-organising principles but undermines effectiveness of the system. Conflict resolution exists, but ad-hoc and without proper procedure.
<u>Enabling conditions (EC)</u>	
EC1: DMCs employ diverse institutions	Partial: Employed institutions are diverse, for example ISP, licensing, operation rules, and seasonal adjustments. However, these institutions are partially enforced, or still under formulation.
EC2: DMCs exist at different levels and jurisdictions	Partial: State management operates at national, provincial, district and ward levels; operators exist at different levels and for different

	purposes; however, cross-provincial decision-making (e.g. basin-scale collaboration) occurs infrequently and case-by-case.
EC3: The jurisdiction of DMCs is coterminous with the boundaries of the problem being addressed	Absent: All basins addressed have flow generated outside of Vietnam (except for VGTB), and no one DMC has full management control over their resource, because upstream actions impact downstream users and there is no functioning RBO yet.
EC4: Generally applicable rules and norms structure actions and behaviours within the system	Partial: Frequent references to laws and regulations, but limited procedures in place for implementation, for example in terms of monitoring, oversight, and enforcement.
EC5: DMCs participate in cross-scale linkages or other mechanisms for deliberation and learning	Partial: Cross-scale linkages exist for certain purposes, like release-schedules from reservoirs ahead of dry seasons, but basin governance suffers from limited information sharing, coordination, and functioning cooperation platforms enabling river basin management of water resources.
EC6: Mechanisms for accountability exists within the system	Absent: The overlapping mandates and functions of DMCs results in deflecting responsibility, and monitoring and oversight in terms of water use is fragmented on basin scale.
EC7: A variety of formal and informal mechanisms for conflict resolution exists within the system	Partial: Informal, ad-hoc mechanisms of conflict resolution exists and appear where necessary in the basin, but there are no basin-wide conflict resolution mechanisms yet.

Table 3: Presence of attributes and enabling conditions in river basin governance in Vietnam. Numbers added for ease-of-reference.

5.6.1 Polycentricity of the governance system

Polycentricity is determined based on the degree of fulfilment of the two attributes. Results linked to the first attribute show that there are several overlapping DMCs with degrees of autonomy to influence decision-making processes, and they also inform and enforce rules with varying capacity depending on the boundary of the DMC within the river basin. There are challenges for implementation and enforcement of rules by the DMCs, but as was clarified in the third section of this paper, the DMCs do not have to illustrate their capacity only for rules-in-use.

The second attribute is considered partially fulfilled because while the DMCs take each other into account in processes of cooperation, competition, conflict, and conflict resolution, they are not entirely self-organising and depend on central direction in most cases (although from multiple central DMCs). Based on this, the river basin governance system in Vietnam is considered polycentric to a relatively high degree, but with limitations in terms of enforcement of responsibilities by certain DMCs and limited capacity for self-organisation.

5.6.2 Functionality of the polycentric governance system

Functionality of the polycentric governance system is determined based on the degrees of fulfilment of the enabling conditions for achieving the three advantages predicted by the model. Table 4 is included below describing the extent to which the advantages can be considered achieved.

Out of the seven conditions (Table 3 above), only five are partially fulfilled, while the remaining are absent. There are diverse institutions employed by the DMCs, decision-making at various levels, cross-scale linkages, rule and norm adherence, and some avenues for conflict resolution, but a recurring issue is limited formal procedures and linkages for these conditions to be conducive to the functionality of the polycentric governance system. This can result in, as was shown, negative competition with limited room for experimentation and innovation in problem-solving, or slow response times for decisions on water allocation.

Another salient inhibiting factor is limited information-sharing and non-transactional cooperation on shared issues in the river basins, causing fragmented monitoring and oversight of water use, availability, and quality. Where effective cooperation and linkages occur, it is without a sense of regularity or reason other than it is expected from DMCs, as was seen, for example, in the planning processes of different DMCs within the river basin.

<u>Advantages</u>	<u>Realisation in the river basin governance system</u>
Adaptive capacity	Partial: DMCs have limited access to, and willingness to participate in, effective deliberative forums to discuss and experiment with water resource management approaches and policy. Deliberative forums are seldom more than consultative and lack power to influence decision-making. Diverse institutions take time to become operational and face barriers in implementation. Policy development for water resources management is based on central planning, or international standards and best practices (such as IWRM), and seldom draws on local communities and end-users. However, ad-hoc cooperation mechanisms and agreements are set up to solve issues, indicating instances of adaptive capacity in practice, although it is not fully realised through procedures or empowered coordinating agencies.
Institutional fit	Partial: While DMCs do not hold decision-making power outside of national boundaries, DMC's capacity in river basins align with the boundaries of the resource at different levels (polycentric system). However, there is weak social fit as the capacity of most end water users to participate in decision-making and institutional design is limited.
Mitigation of risk through redundancy	Absent: There is currently no significant legal gap in terms of responsibility for water resources management. However, there is plenty of overlap which, in the case of river basin governance in Vietnam, contributes to increased non-beneficial competition over

	resources rather than risk mitigation. In other words, duplication of functions of DMC's offers no functional overlap.
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Table 4. Realisation of the theoretical advantages in the river basin governance system

6. Discussion

The capacity of DMCs for influencing decision-making and rules in the Vietnamese polycentric system is largely implied with legal empowerment, which does not automatically translate into functional polycentric river basin governance. The VNMC and RRBO lack financial and human resources to carry out their formally designated responsibilities. Like the case in the Zhujiang River basin in China (da Silveira & Richards, 2013), the RBOs in Vietnam cannot enforce action on basin-level because of the autonomy of the provincial governments. Moreover, in the case of RRBO, leaders of the PPCs are no longer represented, further limiting the exchange between provinces and RBOs. From a polycentric standpoint, the autonomy of the provinces is a prerequisite. But disharmony between provincial planning and basin planning, as well as intraprovincial planning between DARDs and DoNREs highlight limited functionality the province-basin relationship.

Seldom were cases mentioned where cooperation took place for basin-wide benefits. The VGTB-case, where leaders from Quang Nam and Da Nang cooperated to solve issues between their jurisdictions, were out of acute necessity. That, as well as seasonal adjustments of influence over allocation volumes, are compromises struck in a transactional way, a quid-pro-quo without integrated solutions. The limited de-facto integration of policy that is designed for integration creates a unique dimension of conflict between policy and practice, resulting in issues for intrinsically integrated institutions such as the RBO, because the very premise of their existence is rejected in practice and by the multiplicity and autonomy of the DMCs.

In terms of bioregional governance, the RBO-model is prone to “blueprint thinking” or proposing uniform solutions to varieties of problems organised under a single name based on successful examples (Ostrom, 2005: 274). It seems that to get RBOs functional in Vietnam, they need to be fitted to the Vietnamese governance system and its institutions. Besides having adequate resources, the RBO would benefit from adequate representation of DMCs at basin-scale, harmonious with the principles of the polycentric system, and providing real benefits for DMCs. RBOs are organised under both MARD and MoNRE, adding another dimension of polycentricity to them. This discussion highlights interesting theoretical

interlinkages between the polycentric and bioregional models relevant to adaptive governance literature.

A challenge is to ensure provincial benefits without encroaching too much on provincial autonomy that could risk enhancing conflict and competition. Conceivable benefits include a rules-based negotiation and conflict-resolution platform for provinces, technical oversight to limit basin-scale risks and environmental impacts of provincial development projects, and an information sharing and data management platform. However, changes will not happen without trade-offs. Secondly, fully allocating necessary resources and decision-making power to a unified RBO organised under one ministry will be difficult. A pragmatic and context-sensitive solution could be a river basin collaboration mechanism (the middle-way between polycentric and bioregional governance), having DMCs represented in the management board with revolving chairmanship by the central ministries, and technical centres responsible for executing tasks under the overall mandate, reporting to the board.

There is an implied smoothness to the polycentric system, if functional, that is not reflected in the Vietnamese context due to the limited fulfilment of the enabling conditions. The smoothness rests on an assumption that DMCs in a polycentric system have the same, or at least harmonised, overarching goals and absence of worthwhile incentives to deviate from those goals. The common goals exist in the Vietnamese constitution, to the central plans, strategies, and laws, but limited oversight, monitoring and enforcement give room for incentives incompatible with basin-wide needs. The incentives may be for provinces to prioritise local development projects with negative impacts downstream, like sandmining, or drawing more water than allowed, affecting flow and volume calculation.

The lag between adoption of new practices on central and local level indicates a system in change – on the one hand updating legal frameworks to improve water resources management, and on the other hand a reluctance by autonomous DMCs to assume the changes where development dependent on extraction and interference is given priority. Resources to improve enforcement capacity of rules is highlighted frequently in the study, and in previous studies, but how that will happen and who will agree to budget re-allocation remains unclear. However, if polycentricity of the system and its potential benefits are acknowledged, then deliberately designing institutions according to the polycentric model could promote: 1) more beneficial competition and overlap that encourages and rewards innovative policy solutions, 2) removal of barriers for information-sharing, costs, and incentives to withhold data from

other DMCs, 3) development of clear and transparent procedures for norm and rule-based behaviour among DMCs in the river basin.

Finally, there is the problem of trade-offs between environmental, economic, and social concerns, for example balancing minimum flow of rivers with reservoir storage for power or irrigation. Population growth, a central issue highlighted in the introduction, is rarely mentioned as a concern despite being a main driver for urban scarcity and overall water competition. Improving efficiency and effectiveness of water governance is a central concern, but reducing the overall demand is absent in the results save for the elaborations on ISP which could contribute to raising awareness of the real cost of water among water users and thereby finding ways reduce water use. Ultimately, good governance of the water sector should be conducive to aligning priorities across economic, environmental, and social targets.

6.1 On the OTF: Polycentrism or bioregionalism?

Relating to Castro's (2007) discussion on the two different types of water governance definitions, the polycentric model is more process oriented whereas the bioregional seems to have been more of a panacea, or an instrument to reach goals either political, economic, environmental, or social. Although Da Silveira & Richards (2013) referred to prescriptive use of polycentrism, the OTF used here provides a tool for which to identify key polycentric elements and processes and determine the degree of polycentric governance. However, the *degrees* of present, partial or absent are quite general, and in most cases one partial classification is not the same degree of partial as the other. But the classifications require subsequent analysis and discussion, mitigating the issue.

The benefits and risks associated with polycentric governance design are sometimes measured against their implications on democratic institutions, especially in terms accountability systems and participation of non-government DMCs (Carlisle & Gruby, 2019: 2018). The concept of democracy is used differently in Vietnam (GoVN, 2024) compared to electoral democracies, meaning that the relationships between attributes, enabling conditions, and advantages change, albeit still within a polycentric system. While there are no clear indications in the results that the concepts of the OTF are incompatible in the context of Vietnam, importance of certain DMCs to the polycentric system in its original definition, like non-government actors and CSOs, are less relevant. But the key polycentric elements of semi-autonomy, cooperation, competition, conflict, and conflict resolution are still very much present, and the differentiation between government ministries, departments, provinces,

IMCs, dam operators, and so on, is high. It would be a mistake to reject the polycentric model of analysis based on these differences.

6.2 On water tenure

The tenure enthusiast may be disappointed with the lack of connection to water tenure in the results, but it was not abandoned due to the importance of the topic for sustainable and just water resources management. The polycentric OTF and the water tenure approach converge in their emphasis on the relationships between people and water resources.

The tenure implications of the results (and the relationships inherent to the polycentric system) is that increased influence and monitoring capacity of RBOs according to their mandate under the 2023 Law can improve capacity for oversight to formalise assumed tenure. Increased RBO capacity could increase transparency by improved information sharing; increasing predictability of rule enforcement, based on the transparency; providing clarity, information access, and enhanced understanding by *all* actual water users in the basin.

Assuming polycentric conditions and relationships become more functional, they may contribute with positive reciprocal externalities for water tenure, for example: 1) reducing incentives and room for assumed tenure arrangements by improving predictability and transparency through formal procedures, basin-scale DSS, cooperation and conflict resolution; 2) supporting formalisation of assumed tenure arrangements for sustainable use and management leading to improved cross-scale linkages, conflict resolution mechanisms, and accountability of DMCs.

7. Conclusions and recommendations

This thesis set out to contribute to the understanding of the role of governance systems for improving water resource management and, by doing so, explaining the limitations of water governance in Vietnam as identified in previous research and reporting. Using a framework for polycentric governance analysis, the results show that the water governance system in Vietnam is polycentric to a high degree, but with specific local characteristics, and limited functionality. By conducting a polycentric analysis of water as a CPR within the boundary of river basins, the results highlight a convergence between the polycentric and bioregional models of commons governance, specifically where RBOs are designed as collaborative mechanisms of existing institutions.

The gap between normative law and its practical implementation in Vietnam can be explained by different factors, for example looking back at the division of the state management function of water resources between MARD and MoNRE, or by limited financial and human resources. The Vietnamese case underscores how polycentric governance without adequate functionality results in a lack of formal procedures for cooperation without incentives for self-organisation, non-beneficial competition, mandate overlaps which reduce accountability of DMCs, and a lack of conflict resolution mechanisms.

The study's findings suggest that limited functionality of the polycentric system overall can explain the limited functionality and low de-facto empowerment of RBOs in Vietnam. RBOs have been established as unified entities governed as a single DMC, but subject to central oversight, leadership, and budget allocation. Additionally, the RBO-model has been imported and applied as a solution without proper consideration of local characteristics and political system, resulting in similar issues observed in the Zhujiang Basin in China. The unified bioregional governance approach can be seen as incompatible with the fundamentally polycentric water governance system in Vietnam, resulting in institutional bottlenecks and dilemmas of how to reallocate responsibilities and budgets. One possible solution to this problem may be to deliberately design the RBO as a collaborative mechanism of DMCs. Costs of setting up such a system should also be measured against their benefits, and the estimated costs of the current system of river basin governance.

In terms of water tenure, the polycentric governance analysis offers a complementary snapshot to the water tenure analysis conducted by Dr Le Van Chinh (2022). The relationships between DMCs in the polycentric system, and the limited functionality, reflect the challenges of water tenure in Vietnam and carry certain implications. Firstly, a functional polycentric governance system can enhance transparency, predictability of rule enforcement, security of tenure, and an overall improved understanding among all water users through stronger and more cross-scale linkages and information sharing at basin scale. Secondly, by reducing incentives for DMCs and other users to assume tenure rights, new relationships can emerge between formerly assumed tenure holders and other users, contributing to a deliberation and learning process that may support formulation of clearer tenure rules.

An important element of the polycentric model's applicability in Vietnam is the lack of non-governmental decision-making which is central to other contexts. The model seems to be frequently used and referenced in electoral democratic political systems. This is a limitation

of the polycentric model's scope because autonomous DMCs just need to be autonomous relative to each other, as is shown in the case of Vietnam.

If RBOs are the way forward, sincere empowerment is necessary so that they can fulfil their mandate. There is not enough evidence to give definite and fully comprehensive solutions in this study, but they clearly need to align with governance structures in Vietnam, avoiding prescriptive application and allowing for organic, context-sensitive designs. RBOs are also dependent on DSS, reliable data, and monitoring capacity to fulfil their mandate under the 2023 Law on Water Resources, all of which are expensive to set up and maintain. While changes are underway in Vietnam, they will take time. It is important to consider the common overarching goals for basin governance, balancing environmental, social, and economic trade-offs, and being mindful of the institutional preconditions for designing governance systems. This necessitates a measured, continuously evaluating methodology anchored in prevailing governance systems – crossing the river while feeling for stones.

7.1 Recommendations for further research

With more time and resources, a more comprehensive study of Social-Ecological Systems (SES) may be appropriate to capture a wider range of variables and material for evaluating the systems of commons governance and relationships between, in this case, water users. This could be combined with more collaborative fieldwork approaches, such as Participatory Rural Appraisal (PRA), for comprehensive and dynamic collection of primary data and a stronger understanding of water tenure from the perspective of local water users.

Further contributions to the adaptive governance literature could be explored by comparing similar cases of polycentric river basin governance with similar characteristics, for example building off da Silveira & Richards' (2013) study to make a comparative case study design between similar cases to learn more about polycentric governance outside of the electoral democratic setting.

The study of technological application for governance systems may be an interesting avenue of research in the field of adaptive governance, particularly how they may be conducive to fulfilling enabling conditions and the advantages associated with functional polycentric systems.

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Annex 1. Development context

After the end of the Second Indochina War (also known as the American War, or the Vietnam War) and the subsequent reunification of North Vietnam and South Vietnam in 1975, the leadership of the Communist Party of Vietnam (CPV) attempted to expand central planning policies to the more productive and prosperous South. This contributed to a steep decline in agricultural output. By 1980, it was estimated that the per capita national output had fallen by 10 percent, with an inflation rate of 140 percent (Irvin, 1995). Vietnam continued to face economic problems and food insecurity during the first half of the 1980’s, which eventually led to the enactment of the *Đổi Mới* (translates to ‘renovation’) policy reforms in 1986. Through this policy, the Government of Vietnam effectively abandoned the socialist industrialisation model in favour of a market-oriented growth model led by the agriculture sector, which, among other things, strengthened farmer’s land use rights and management autonomy (Irvin, 1995).

In recent years, a combination of economic policies, access to an abundance of natural resources and a strong demographic dividend have contributed to the transformation of Vietnam from a low-income to a middle-income country in two decades (World Bank, 2019). Vietnam has had among the fastest and most equitable trajectories of economic growth in the world, with gross domestic product (GDP) averaging about 6.4 percent over this period. Rapid economic expansion has been accompanied by export growth, inflows of foreign and domestic investment, improved access to health and education services, and provision of piped water to its growing cities (ibid). Riding this momentum, the Government of Vietnam is aiming to become a high-income country by 2045 – an ambitious goal (World Bank, 2022). In the Socio-Economic Development Strategy (SEDS) for the period 2021-2030, the Government acknowledges that growth will rely on improved management of natural resources (water, forests, minerals) – the heavy extraction of which have driven the impressive growth rate in the past (ibid).

The ambitious development objectives of the Government will increase freshwater demand, which is likely to exacerbate current water scarcity trends if the previous decades serve as

indicators (FAO, 2019). Taking the agriculture sector as an example (responsible for most of the freshwater extraction, both surface and groundwater), the Government recognises that improved management of water resources is required from farm-level (irrigation systems, water use efficiency, wastewater treatment, agrochemical use, and so on) to basin-level (watershed and coastal protection forests, water allocation and diversion, energy, and so on) (IPSARD, 2022).

Annex 2. Constitution and laws

Matrix for providing an overview of laws relating to water resources management, water and land use rights.

Source: Le, V. C. (2022). Report on Water Tenure in Vietnam. *Food and Agriculture Organization of the United Nations*.

Law	Main content related to water resources	Water rights and/or land rights	Recently issued	Previously issued
Constitution		Water resources, among other resources, is the public asset, belongs to the entire people and is managed unitedly by the state (Article 53).		
Law on Water Resources	Foundation for water governance in Vietnam, including the use of surface water, rainwater, groundwater and sea water	The protection, exploitation, and use of water resources; and the prevention, control and remedy of harmful effects caused by water. (Article 3, A 31). Registration and licensing of water resource exploitation and use. (A 44) Water allocation for water users (A54) The minimum flow on rivers (A3, A53) and All activities related to water resources have to ensure no obstruction to the flow (30) Investment for water facilities have a right to use water (A4) but are asked for forest protections/compensation (A29) Regulations on rights of wastewater discharge and treatment (A37, 38) Right to conduct water through adjacent land plots which are managed and used by others in accordance with law (A43).	2012 (updated 2023)	1998

		Water quality (A: 3, 19, 26, 27, 37, 38, 48, 49, 54)		
Law on Land		Limited rights to use the adjacent land plots includes path, drainage and irrigation in cultivation (A 17) The use of surface of river, streams, canals have to not obstruct the natural flows and navigation – waterway (A163)	2013 (updated 2024)	2003
Law on Environment Protection	Water environmental protection	Protection of river water environments: management of protection corridor of water resources, relevant exploitation and use of water resources (A7); Protection of groundwater environment (A10) Responsibility of investors to water quality, wastewater discharge and treatment (A37)	2020	1993, revised in 2005 and 2014
Law on Hydraulic Works	Planning, investment, construction and management of water facilities for supply and drainage in agriculture and rural area, and related water management tasks as well as provisions for cost recovery and financing	Investment for water facilities have a right to use water (A15). Ensuring the water allocation between water in the irrigation systems and water for other purpose in the catchment (A15). Rights of irrigation schemes owner in providing contracts with organizations and individuals for managing irrigation systems; supervising the supply and use of irrigation products and services (A 22) Types of water supplier/organizations providing (Companies, WUAs and individuals) and method of management of irrigation systems (Planning, contracts/agreement, Bid) (A 23). Irrigation service provision by contract (A 29)	2017	
Law on Natural Disaster Prevention and Control	Planning and response to disaster risks (flood, drought,)	Solutions to prevent from flood, inundation, drought and salinity intrusion (A26)	2020	2013

Law on Dyke Management	Maintaining dykes and flood protection	Land use for dyke construction and upgrade (A21) Licences for groundwater abstract within dyke protection area (A25) Operation of upstream reservoirs for flood control (A33)	2020	2006
Law on Forestry	Management, protection, development and utilization of protective forests for protection and conservation of water resources, Services of forest environments	Protective forests for protection and conservation of water resources (A3), Development of protective forests (A 47) Services of forest environments for regulating, maintaining water resources for production and development (A61-63)	2017	1991 and revised 2004
Law on Electricity	Investment, construction and operation of hydro-power dams	Safety requirements in operation of reservoirs in service of hydro-electric power plants and in water storing (A 54) Prioritization of the adequate and timely supply of electricity to water pumping stations in service of irrigation, waterlogging and drought fighting in mountainous and remote areas (A60) Preferential payment of irrigation electricity charges by the government for waterlogging and drought (A63)	2018	2004, revised 2012
Law on Planning	Comprehensive and integrated planning for all governance activities including water governance and other related-water management.	Planning of water resources at river basin level (A3)	2017	
Law on Investment		Investors are able to access and use credit, funds, land other resources	2020	2014

		(including water resources) as prescribed by laws (A5).		
Law on Fisheries	Habitat for aquaculture and fishery	Regulations on protection of water habitat for aquaculture (A10), protection of aquatic species in wetland areas (A19), registration of aquaculture by cage (A38)	2017	2003

Annex 3. Interview guide

Semi-structured interview questions.

Numbers are central questions, and subordinated sentences (marked with letters) are for support to ask follow-up questions or clarify concepts.

1. How would you describe the way “water resources” is understood, described, and approached in Vietnamese law and policymaking?
 - a. Could be in pure legal terms, but also mindsets and commonly held philosophy of water use.
 - b. Are they generally seen as isolated, or are integrated understandings and approaches becoming more common, e.g. are laws and strategies harmonized with agriculture, forestry, biodiversity, and industries?
2. What are the most important laws, regulations, or other types of policies, to water allocation and prioritisation?
 - a. De facto, de jure, or in your opinion.
 - b. To understand governance, we need to look at the **intention** of policy and the accuracy by which it is implemented.
3. What mechanisms or avenues exists for making use of local knowledge?
 - a. Is there information sharing mechanisms between water users and policymakers? How does that work?
 - b. Are there ways for local government to adjust laws to suit local conditions?
 - c. Can local water users (individuals, WUO’s, companies, etc) participate in modifying operational rules?
 - d. Are there monitoring systems in place?
 - e. Accountability systems for rule-breaking?
 - f. Conflict resolution mechanisms?
 - g. Are there ways for local water users to organize themselves?
4. What was the main objective of the revision of the 2012 Law on Water Resources?
 - a. How did the consultation process work? Who were involved?
 - b. How are the needs and inputs from different water use sectors balanced?

5. In your view, did changes occur in the LWR update that impacts water resource use rights (directly or indirectly), oversight of actual water use, and RBO's?
6. Establishment of RBOs has faced challenges in Vietnam historically, despite being piloted several times in the past decades, and included in the 2012 Law on Water Resources.
 - a. Why are RBOs important institutions for water governance in Vietnam?
 - b. What are the central challenges to establishing functioning RBO's in Vietnam?
 - i. Do you see similar challenges manifesting in other countries, and what do these countries share?
 - c. Which preconditions for sub-national, intra-provincial, and basin-level governance stand out in the Vietnamese context?
 - d. In your opinion, based off your work, your position, and your experience, what function can an RBO have for improving implementation of water tenure arrangements/security of actual water users?
7. How are river basin planning and provincial planning conducted with respect to water resources?
 - a. Are they developed with synergy in mind?
 - b. What does this imply for sustainable water management, governance, and tenure?
 - c. How are river basin plans arranged?
8. How does current water tenure arrangements attempt to address conflicting interests of water users in Vietnam?
 - a. Tips for clarifying water tenure: oversight of use, understanding of use, water use rights, instances where use rights are assumed, and relationships between users and resource.
 - b. Local vs Central, Development vs Management, Community vs Individual water use rights, etc.
9. Are there any glaring gaps in the legal system with respect to water tenure, water use and particularly water allocation?
 - a. If yes, what are the critical gaps and why? How can they be addressed?
 - b. If no, then wherein lies potential for improvement in the realm of water tenure?
 - i. E.g. security, equity, sustainability, or efficiency?