A COMPARATIVE STUDY OF COALITION NETWORK WITHIN AND BETWEEN THE UNITED STATES AND SOUTH KOREA: CASE STUDIES OF DAM CONSTRUCTION AND REMOVAL

Workshop: Portability of "Western" Policy Theories

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Abstract

While many Advocacy Coalition Framework (ACF) applications in a recent pluralistic settings found the ACF useful in illuminating the policy process in diverse contexts, their results also raise two questions which need answering. First, from the ACF applications to recent pluralistic settings can we conclude that policy process in recent pluralistic countries is mainly centralized and weakly localized? Second, are there better practices for building the global growth of knowledge of policy process in different institutional settings through the lens of ACF? This paper compares politics and policy decisions within and between a recent pluralistic (South Korea) and pluralist (the United States) countries in the context of dam construction and removal. Applying the Advocacy Coalition Framework (ACF), I not only test traditional hypotheses of coalition, but also develop new hypotheses to compare structural characteristics of policy sub-systems. The hypotheses are tested by examining (1) whether coalitions were stable; (2) how coalitions changed their belief; and (3) whether policy actor's importance in coalition network varies by institutional role. Using coded data of news articles within selected states/provinces across the two countries, I find (1) coalition stability across sub-systems; (2) divergence in patterns of belief change between policy change and status quo cases; (3) partial

support for . The findings provide both theoretical and methodological insights into how and why politics and policy outcome are similar and different by institutional context.

Key Words: Comparative Public Policy, Advocacy Coalition Framework, Discourse Network Analysis

Introduction

The Advocacy Coalition Framework (ACF) has been served as a research platform to simplify the complexity of policy processes. The ACF was devised to explain policy problems in the United States, where diverse types of policy actors conflict with respect to policy goal and means (Sabatier & Jenkins-Smith, 1988). For over 30 years, the framework has been applied to numerous policy sub-systems and revised to improve its portability to different political settings. In the early years, the ACF was mostly applied to environmental issues in the United State, but its domain of application spread throughout different policies and the world (Weible et al., 2009).

One reason for the extension of the ACF applications comes from its usefulness of the framework-theory distinction. A framework consists of a shared concepts and general statements telling relationship between concepts (Ostrom, 2005). Based on the framework, analysts seek to explain relationships between concepts and a substantial partition of policy phenomena in a narrower scope (Henry et al., 2014). Because analysts communicate results of research in the shared vocabularies the community of public policy can accumulate knowledge about policy process and detect contextual nuances therein (Jenkins-Smith et al., 2017).

Scholars have been shown active applications of the framework to South Korean policy

process. The framework has been applied to 86 Korean cases in peer-reviewed journals over the past 15 years.[1] This is partly because the ACF provides Korean scholars with a useful theoretical framework for understanding policy issues. While many Korean ACF applications found the ACF useful in illuminating the South Korean policy process, their results also raise more questions which need answering. First, from the ACF applications of national-level policies can we conclude that Korean policy process is mainly centralized and weakly localized? Most Korean ACF applications investigated national-level policy process, but more ACF applications to local-level policy sub-systems might refute this tentative conclusion.

Second, are there better practices for building the global growth of knowledge of policy process in different institutional settings through the lens of ACF? The ACF's applicability outside of Western countries is a main concern of the community of ACF researchers (Weible & Sabatier, 2017). However, most ACF applications to Korean cases do not provide documented findings of the established relationships between key concepts of ACF due to lack of clear methods of data collection and analysis (Kim, 2010; Jang et al., 2016). Some scholars conjecture about this trend by mentioning higher costs of methodology for policy process study than for other areas in policy study (Kim, 2010; Joo, 2011). Hypothesis testing for internal dynamics and outputs from it was rare in the Korean applications. Notwithstanding this challenge, the study of Korean policy process needs still more ACF applications with formal theoretical

[1] Jang et al. (2016) reviewed 67 Korean ACF applications 2002- through 2014. The number 86 comes from an update by including the number of applications in 2015 and 2016. The statistics comes from the search in the Research Infrastructure Support Services (RISS) with the keyword of advocacy coalition framework retrieved from http://www.riss.kr in November 2, 2016.

expectations, such as hypotheses and propositions.

In order to bridge the gap between ACF applications in its original and recent settings, this paper suggests a comparative approach to the ACF application. It aims to develop a systematic comparison of policy process across political systems in the ACF practice. The suggested approach follows insights of comprehensive views of ACF applications and diverse approach to case selection (Jenkins-Smith et al., 2017; Gerring & Cojocaru, 2016). I suggest three research strategies and show how to follow them for comparative work. First, test traditional hypotheses of the ACF to probe similarities between and within cases. A hypothesis is what theory expects on the most important relationships among concepts (Whetten, 1989). Testing hypothesis within cases is a solid way to explore the portability of the ACF.

Second, make an expectation of when the ACF is applied in a comparative setting. The expectation is stated as a hypothesis with the ACF terminologies. Because few studies empirically and systematically compared key elements and relationships between them in the ACF study, there were not many attempts to develop the hypotheses for the ACF in a comparative setting, except for Gupta (2013). Following the importance of the systematical comparison of complexity of the policy process in different political systems, this paper suggests and tests a set of new hypotheses for comparison of coalitions.

Third, choose a diverse-case method for the same research question. This approach selects cases in order to maximize the range of dependent and independent variables (Seawright & Gerring, 2008). This method assumes that true causal factors can be found among possible causes of a dependent variable (Gerring & Cojocaru, 2016). Setting policy change as a dependent

variable and institutional arrangement as an independent variable, this paper compare structural characteristics of advocacy coalitions in eight political-institutional settings systems within and between South Korea and the United States.

The rest of paper illustrates these ideas of the systematic comparison with empirical analysis. I start out by discussing what challenges researchers can face when they apply the framework to other institutional settings such as South Korean political systems. Next I suggest research strategies to overcome those challenges and develop new hypotheses from a comprehensive review of past ACF applications to South Korean and the United States political systems. Then I illustrate how those strategies can be used in empirical study. After providing details about the sample and methods in employed in this paper, I present the results of hypothesis tests and compare them with existing findings on advocacy coalition. The last section discusses implications for the ACF and comparative public policy for future research.

The concept of coalition in the ACF

The scope of the ACF is to explain contentious policy issues through hypothesized relationships between explanatory factors. The framework establishes several hypotheses relating key concepts involving coalitions, policy learning, and policy change.[2] The ACF has seven primary assumptions. The first one is that the policy subsystem is the main unit of analysis. Second, in common with Heclo's (1978) issue network, it assumes that any actor relevant to a subsystem intends to influence the outcomes of the policy process. Third, the behavior of a policy actor is based on Herbert Simon's bounded rationality, and coalesced group. Fourth, policy actors

[2] See Jenkins-Smith et al. (2017) to see a comprehensive view of the ACF.

interpret the policy process they are in through their three-tiered belief structure: (1) Deep core beliefs (social fundamental norms), (2) Policy core beliefs (normative and empirical to specific policy topic), and (3) Secondary beliefs (specific means to achieve outcomes defined thorough the policy core belief). Fifth, policy is the translation of the beliefs held by coalition(s) of policy actors. Sixth, scientific and technical information plays an important role in policy process. Seventh, policy process and change occur over a long period of time.

When a policy subsystem has contentious policy issue, two or more coalitions are assumed to compete with each other to influence policy decision by authority. Beliefs and resources are hypothesized as glue of each coalition. Coalition dynamics have an impact on institutional rules, policy outputs, and policy outcomes in sequential order. The coalition resources and interaction are conditioned by multi-dimensional and multi-level sets of variables. The contextual factors are classified into relatively stable parameters, external subsystem events, long-term coalition opportunity structures, and short term constraints and resources of sub-system actors. Although some concepts within these categories are conceptualized as external to sub-system, other concepts are expected to affect opportunities for coalitions to exploit. The relationships between relatively stable parameters, external subsystem events, and coalition dynamics are mediated through the long-term coalition opportunity structures (COS).

Following the theoretical emphasis, the ACF offers sets of traditional hypotheses for the theoretical logic about a coalition is hypothesized in several ways (Sabatier, 1987; Jenkins-Smith & St. Clair, 1993). One part of these hypotheses focuses on how policy actors coalesce into groups and coordinate with each other in what ways. To date, empirical applications of the ACF strongly support the statement that coalitions form based on shared beliefs (Jenkins-Smith et al.,

2017).

The other part of the hypotheses tests the expectation that coalitions differ in the way and intensity of expressing their beliefs (Sabatier & Weible, 2007). By testing the hypotheses, ACF researchers analyze whether coalitions keep their stability over time, to what extent coalitions share heterogeneity, how much interactions of inter-coalition and intra-coalition occur during an observation period, and whether shared policy beliefs function as the glue of coalitions. It is strongly supported in many contexts that the lineup of coalitions remains stable over time in the adversarial landscape. Also it is supported or not supported that the policy core belief is the glue of coalition membership and that the policy actor's policy core is more resistant to change in a hierarchical belief system (Jenkins-Smith et al., 2017).

Challenges of the ACF in a comparative public policy perspective

For over 30 years, the ACF has been applied to numerous policy sub-systems and revised to improve its portability to different political settings. In the early years, the ACF was mostly applied to environmental issues in the United State, but its domain of application spread throughout different policies and the world (Weible et al, 2009). In the view of comparative public policy (CPP), however, three big challenges need to be addressed before proceeding to apply the ACF to this comparative work.

First, whether comparing policy in heterogeneous contexts can be done within a unified base is a long-lasting contentious issue in both the CPP and the ACF. Numerous epistemological and methodological approaches have been undertaken in a fragmented way. The initial outburst of comparative studies showed incompatible meanings of public policy, low consensus on

explanatory factors for public policy, and general and vague propositions of the relationship between public policy and institutional factors (Freeman, 1955; Heidenheimer, 1985; Scharpf, 2000; Schmitt, 2012). The ACF also confronted the same conceptual problem, when it was applied the outside of the US. One critical critique was that the ACF applications to non-pluralistic political systems relied on conceptual straining of narrowly defined institutional arrangements that formed the basis of many of ACF's theoretical arguments, particularly about coalitions (Kübler, 2001). Concepts of the framework were evaluated as not specific enough to catch the important variation in contextual factors that might influence coalition dynamics. Whether the ACF can be useful in non-pluralistic settings, such as corporatist or authoritarian systems, was a contentious issue because the initial ACF applications implicitly assumed typical characteristics of American pluralism of interest groups, public agencies, political parties, decision-making venues, etc. (Parsons, 1995; Sabatier, 1998). Scholars who applied ACF to Asian countries, whose contexts are semi-pluralistic or authoritarian settings, emphasize more variation of external contexts of policy sub-systems, which are more stable in Western countries (Henry et al., 2014; Hsu, 2005; Kwon, 2007; Scott, 2012). In response to this critique, the institutional arrangements were segmented into relatively stable parameters and long-term coalition opportunity structures in recent ACF constructions (Sabatier & Weible, 2007). The next challenge is to move from the general supposition of the relationship between institutional arrangements and policy to empirical tests.

Second, comparative study with the ACF should incorporate the two independent streams: the long history of comparative policy study and over 30 years of the ACF. This implies an uncomfortable nestling of comparative work with ACF with the CPP. The long-lasting debate,

raging over whether the CPP is a study field or just a methodology (Almond, 1966; Lijphart, 1971), was not productive enough to develop an approach to comparing components of policy process across political system. The CPP will become a field and advanced in methodology only if a comparison of components is guided by established theories, organized by explicit theoretical premises and specialized interest (Feldman, 1978). Hence, applying an established theory of policy process to comparison can be a promising strategy toward the prosperity of the CPP. Using the ACF for comparative study can be a research strategy to remedy this. The ACF can provide a shared vocabulary and research platform where scholars work together in explaining not a complete but a prominent portion of the policy process. By employing common terminologies in an established theory, cross-cases equivalence could be secured. By developing new comparative hypotheses within an established theory, researchers can broaden the theoretical outlook and achieve methodological rigor.

Third and relatedly, to make the ACF a better platform for accumulating knowledge of policy process, we need to develop several hypotheses of ACF in the comparative setting that account for different contexts. Because few studies empirically and systematically compared key elements and relationships between them in the ACF study, there were not many attempts to develop the hypotheses for the ACF in a comparative setting, except for Gupta (2013). Following the importance of the systematical comparison of complexity of the policy process in different policy sub-systems, this paper suggests a set of new hypotheses for comparison of coalitions, expert-based information, and patterns of policy change.

Notwithstanding the challenges of applicability of the framework, the ACF continues to be applied in diverse settings, especially to explain the policy process of South Korea. This is

partly because the ACF provides Korean scholars with a useful theoretical framework for understanding policy issues.

The usefulness of the ACF in Korean context comes from the applications to the Korean policy process which vary by time and topic. The main findings of ACF applications to Korean cases are summarized into three main points (Jang et al., 2016). First, the sub-systems of South Korea have a centralized and national-level structure. Influential policy decisions occur in a small number of venues at the national scale. For most policy agendas, the central government is highly involved in each subsystem. Second, the Korean policy process is characterized by pluralism but is less pluralistic than in Western democracies. Contentious politics surrounding policy agendas occur; this is characterized as a lasting debate between more than two coalitions through the lens of the ACF. However, the proportions of coalition members are more unbalanced than those of Western countries. While bureaucracy, political party, and large business affiliates are principal members across sub-systems, the non-government organizations and civic participation have a smaller proportion in coalition membership. Third, policy change occurs mainly by changes in the governing coalition and external shocks. Regime change by election usually leads to major policy change. Changes in national population trends and socio-economic conditions are considered as a main source of external shocks. The meta-analysis of Jang et al. (2016) indicates that ACF has a robust usefulness as a framework explaining at least several critical aspects of Korean policy process.

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In order to bridge the gap between ACF applications in long-lasting and recent pluralistic settings, I propose a comparative approach to the ACF application. Comparative study of the ACF across different political systems can be a convincing way to answer those two questions. Comparing within and between cases in both countries will show differences and similarities in structural characteristics of policy sub-systems. The foci of the comparative study are (1) What traditional hypothesis of the ACF is more or less supported in comparable political systems and (2) How institutional and environmental parameter variations affect the behavior of coalitions in pursuit of policy change. Also, comparing elements and the relation among them will show why

the internal perturbation does or does not lead to policy change. Finally, the comparative work on the ACF is formally documented using concepts and hypothesis testing of the ACF.

Research strategies and hypotheses for comparative work

Traditional coalition hypotheses

For over 30 years, ACF scholars have elaborated the framework by adding and revising hypotheses and by accumulating empirical applications. In the latest version, a total of 13 traditional hypotheses exist in the description of the ACF in its three theoretical foci: the structure and stability of advocacy coalitions, occurrence of policy learning, and pathways to policy change (Jenkins-Smith et al., 2017). By analyzing eight sub-systems in South Korea and the United States, this paper tests the traditional hypotheses of coalitions and policy change.

The traditional hypotheses of coalitions explore how, when, and why actors coalesce into groups, maintain their coalitions, and are restricted in their behavior. Coalition is a main concept and metaphor that catches important behavioral patterns of actors. This concept is increasingly attractive for scholars, as the boundary of a policy subsystem is becoming difficult to describe with clarity. Unlike the explanations of traditional models of policy actors, more subsystem actors beyond typical actor categories at the center of political science, such as the legislature, government agency, and interest groups, are being found and described in the policy process literature, which makes policy process difficult to explain (Heclo, 1978; Hjern & Porter, 1981). The ACF's theoretical emphasis on coalition not only sheds light on how to analyze the growing complexities but also provides a platform that enables scholars to accumulate generalizable patterns of actors.

The boundary of coalitions is defined by the actors' beliefs on policy decisions in the subsystem (Jenkins-Smith et al, 2017).[3] In the ACF, public policy is interpreted as a reflection of the beliefs of individuals (Ingold, 2011). That is, every policy actor desires to transplant their beliefs. Due to their limited ability to influence policy process, individuals strengthen ties with people who have a similar belief system and develop common strategies towards opponents (Weible, 2005). In this paper, policy core belief is defined as a normative rule that prescribes basic orientation and value priorities for policy decisions on dam construction/removal. Thus, beliefs function as fuel to strengthen unity within a coalition and to mitigate conflict among allies over policy decision. This claim needs to be tested through the first two ACF hypotheses.

Hypothesis 1: On major controversies within a policy subsystem, when policy core beliefs are in dispute, the lineup of allies and opponents tends to be rather stable over periods of a decade or so.

Hypothesis 2: Actors will give up secondary aspects of their belief systems before acknowledging weakness in the policy core.

These traditional ACF hypotheses have been tested in a single case study setting. However, testing these in a comparative context is also useful in clarifying the difference in policy outputs (including coalition structures) based on characteristics of the institutional settings in the comparative cases. This is because we are not aware of what hypothesis is more (less) supported in which context. While these three hypotheses were actively tested in American policy sub-systems, they were rarely tested in Korean contexts. Since there hypothesis were

[3] See Jenkins-Smith et al. (2017) for the detail of belief system.

developed in order to highlight the most important relationships in the coalition scope, testing and comparing these hypotheses in the comparative cases is more rigorous and pragmatic than the meta-analyses of the ACF in Korean context.

In terms of the coalition change and structure, Korean sub-systems might show similar patterns with American policy sub-systems since the composition of policy actors is getting diverse beyond the legislative committee, the government agency, and the interest group in the Korean sub-systems. Policy community that consists of national government agencies of construction and transportation and public enterprises had dominated Korean water resource policies before the 21st century (Choi, 2007). After the democratization of 1987, however, recent dam construction process tends to be protracted due to conspicuously increased conflicts between stakeholders (Kim, 2015). In sum, I expect support of hypothesis 1 and 2 for both countries.

New hypotheses for comparison

Initial ACF applications to pluralistic systems made implicit assumptions about political attributes of a subsystem (Sabatier & Weible, 2007). These include dispersed authority by federal/state governments, the House, the Senate, etc., supermajorities able to change and implement public policy, and well-organized interest groups (Sabatier, 1998; Tarrow, 1994). However, when the ACF is applied in a non-pluralistic setting and these assumptions are violated, additional explanatory factors are necessary to explain the dynamics of the coalition and drivers of policy change. For example, many Western and Northern European countries show that authority for policy decision is concentrated in a small number of groups that share a

common interest or profession (Schmitter, 1974). For another example, transition countries in Central and Eastern Europe have a long history of restricted civic engagement in policy decisions (Mansfeldová et al., 2004). To address this concern, a dimensional approach to diverse features of polity was proposed as COS in the 2007 version of the ACF.

The COS consists of two interrelated dimensions. The first dimension is how open a political system is, meaning how many policy venues there are and how much access policy actors have. The second dimension is about how much consensus is required for a major policy decision. Sabatier & Weible (2007) suggested the typology of COS with the two dimensions (see Table 2).

According to the typology of COS, a pluralistic political system is expected to have more open policy venues than corporatist and authoritarian systems. In terms of openness, the United States, a typical pluralistic system, is expected to be at a high level of openness of a political system. On the other hand, Korea is expected to be somewhere between high and low openness, because the country has relatively long vestiges of authoritarian systems and a short recent history as a democratic system.

Table 1. Typology of Coalition Opportunity Structures

Openness of Political System	**Degree of Consensus Needed for Major Policy Change**		
	High	Medium	Low
High	Pluralist	Pluralist	
Medium	Recent Corporatist	Westminster	
Low	Traditional Corporatist		Authoritarian Executive

Source: Sabatier & Weible (2007)

The pluralist assumptions might not fit with countries that have a short history of pluralism either. South Korea has had 30 years of democracy, but it has a strong legacy of an authoritarian system, marked by centralized authority toward government, top-down governance, and less organized civic engagement (Choi & Baek, 2001; Pak, 1998). Since their application in 2002, most Korean ACF studies have found that actors who were affiliated with governmental agencies, such as bureaucrats, elected officials, and politicians from the ruling party, comprise a large portion of principal membership of coalitions (Jang et al., 2016). They were the traditional policy actors across sub-systems in South Korea, especially bureaucrats, who have taken the lead in the modernization and industrialization of Korean society in the last several decades. Although the monopoly by bureaucrats has become a bit weak in recent policy process, the traditional policy actors usually dominate politics surrounding policy topics (Yoon, 2016). Following the existing typology of COS and incorporating the findings of recent pluralistic settings, I expect that this theoretical logic would lead to the following hypothesis:

Hypothesis 3: The less openness the political system has, the more important government agencies are in the coalition network.

On the other hand, Korean non-profit organizations (NPO) are expected to be less important than American NPOs in coalition dynamics. This expectation can be drawn from the social origins theory that explains diversity on nonprofit sector (Salamon et al., 2000). Social choice of public, private, and third sector differs by legacies of political system that shape the range of options available to contemporaneity (Seibel, 1990).

Anglo-Saxon countries (including the United States) characterized by dominant market

sector and residual public sector are expected to have bigger non-profit sector and smaller government social welfare expenditure (Esping-Andersen, 1990). Volunteer activity has a close association with the development of democracy in the United States (Tocqueville, 1994). Volunteer activity has helped immigrants settle, motivated the growth of NPOs, and filled a gap in public service in the United States. For this reason, NPOs accounted for 9.2% of all wages paid in 2010 and 5.3% of GDP in 2014 (The Nonprofit Almanac, 2012; US Bureau of Economic Analysis).

Rachel Carson's *Silent Spring* of 1962 brought environmental pollution issues into an important policy agenda in the United States. Since the 1970s, environmental NPOs have shown remarkable growth through global environmental issues of the 1980s, its quantitative growth, and a variety of specialization in sub-topics in the 1990s (Tarrow, 1994). Moreover, US environmental NPOs underwent a process of institutionalization in the 1970s, which expanded their channels of influence over policy process. Under the Administrative Procedure Act (APA) and the National Environmental Policy Act, they are assured of access to policy decisions, gaining related information, and advancing their opinions related to policy decisions. Court acknowledges environmental NPO to plaintiff when environmental benefits the APA acknowledge are usurped. Each environmental protection law has the Citizen Suit Provision. Under the Public Information Act and Government in the Sunshine Act an NPO can propose public policy, investigate for policy analysis, as well as file a suit against the government. The way that campaigns are run for translating NPO's beliefs to policy decisions varies from radical ones, such as demonstrations, stay-in strikes, picketing, to legal ones, such as lobbying, lawsuits, or intervention in the elections (Michell et al., 1992).

In contrast, Korea fit the statist model, with small portions of both state expenditure on social welfare and non-profit sector. Korean NPO's have been described as having less cohesive interactions between or within coalitions than those in government agencies (Kim, 2006). Compared to American NPOs, the opportunity for Korean NPO to participate in the policy process is limited. Before the democratization of 1987, the relation between the authoritarian government and NPOs was either antagonistic or a subordinate one (Jeong, 2006). After the democratization of 1987, civilian governments expanded public access to policy decisions. As concern for civility emerged as a big story, the political influence of NPOs also increased. The Public Information Act and the Administrative Procedure Act of 1998 legislate for NPOs to monitor judicial, legislative, and budgeting activities. Although the Korean government emphasized government-private partnership and collaborative governance to reflect diversity and capacity of civil society in policy decisions, those efforts ended in perfunctory civil participation and government-centered network (Jeon & Choi, 2014).

During the rapid growth of environmental NPOs, most resources were centered on a few organizations (Oh et al., 2005). This centralization made them bureaucratic juggernauts (Cho, 2005). Consequently, communication within and between organizations broke down. While environmental NPOs have a close relation with government and enterprise, they grow farther apart from civil society and the environmental field. The centralized but inefficient operation of NPOs is making environmental movements more challenging.

In sum, this variation of influential power among policy actors might be attributed to a centralized structure of South Korean governance and legacy from the modern history of authoritarian regime. To test these arguments, I set the fourth hypothesis as follows:

Hypothesis 4: The more openness the political system has, the less important NPOs are to the coalition network.

Data collection and Sampling

Defining policy decisions such as dam construction or removal as a policy change, this paper highlights patterns and structures of coalition in the water resource policies of South Korea and the United States. I used eight different cases of dam construction/removal sub-systems of South Korea and the United Sates to test ACF hypotheses. Table 2 provides an overview of their characteristics. The case selection follows a diverse case method, where the selection of cases maximizes the range of dependent and independent variables (Seawright & Gerring, 2008). This method assumes that true causal factors can be found among possible causes of a dependent variable (Gerring & Cojocaru, 2016).

An outcome of interest is variation in policy decision. Four out of the eight cases represents policy change, while the four status quo. Since the policy decision is defined as a discrete event (status quo/policy change) surrounding dam construction/removal, there must be at least two cases that exhibits different values on policy decision. The cases chosen do not reflect the distribution of the outcome variation in both countries, but they are minimally representative in terms of representing the full variation of the policy decision. Although the ACF defines a minor policy change, a partial change of status is not considered in this paper because it is not possible to establish a common concept of minor policy change in the contexts of dam construction/removal.

Another outcome of interest is coalition network. Inspired by the Discourse Network

Analysis (DNA), this paper conceptualize network from annotated statements of actors in newspaper as coalition network (Leifeld, 2013). In the notation of network, actors, their link by each policy content, and degree of belief congruence between actors are inferred from node, edge, and edge weight between nodes respectively. Moreover, comparing different timelines in longitudinal networks might show a change in the relationship between actors. Hence, based on the combination of network components, the graphical network allows us to infer individual and group attributes of actors, such as the importance of an actor, boundary and sizes of coalitions, and changes thereof.

The other factor diversified in value is a set of variables of macro-political system attributes. These variables are grouped as moderate and highly pluralistic political systems; details of the two political systems were discussed in the section of the new hypotheses. In sum, South Korea represents a country with recent history of democratization, strong state, and weak and monotonous civil activities, whereas the United States does a country with relatively much longer history of democratization, weaker state in comparison to civil society, and various non-governmental activities (Andrews & Edwards, 2004; Skocpol & Fiorina, 1999; Yoon, 2016). Selecting the two countries does not encompass the full range of values characterizing macro-political system because there are other countries that represent corporatist or authoritarian political systems. Notwithstanding these limitations, this case selection is expected to be a minimum basis for generalization of water policy process in pluralistic settings.

In conclusion, this paper selects eight cases of dam construction/removal in both countries. Four are from cases of policy decisions on dam construction in South Korea, and the others belong to cases of policy decisions on dam removal in the United States. The table 2

summarizes the case selection for the analysis.

Table 2. Case Study Characteristics

	Policy Change Status (Year of data collection, Number of newspapers coded)	
	Status quo	**Major change**
South Korea (Recent pluralistic)	(1) Garolim Bay tidal power station in Chungnam (2006-2016, 141) (2) Yeongyang dam in Kyungbuk (2008-2016, 41)	(3) Young-Ju dam in Kyungbuk (1999-2009, 91) (4) Hantan River dam in Gyeonggi (1999-2007, 415)
The United States (Highly pluralistic)	(5) Susitna hydraulic project in Alaska (2007-2016, 92) (6) Glen Canyon dam in Arizona (1999-2016, 166)	(7) Copco 1, Copco 2, John C. Boyle, and Iron Gate dam in Oregon and California (2001-2016, 300) (8) Elwha and Glines Canyon Dams in Washington (1992-2010, 76)

The first case study is about Elwha and Glines Canyon hydroelectric dams in Washington State. Elwha dam was built in 1913; Glines Canyon dam in 1927. Elwha dam failed to pass its safety inspection in 1978, following a FERC license application. Since then, the Lower Elwha Klallam Tribe and conservation groups had called for dam removal. The Elwha River Ecosystem and Fisheries Restoration Act passed into law, calling for full restoration of the Elwha River ecosystem. Environmental Impact Statements and Report (EIS/EIR) had recommended dam removal as the best option. The dam removal began in September, 2009.

The second case study is about hydroelectric dams in Klamath River. They are located in the California-Oregon border. Copco 1, 2, John C. Boyle, and Irongate dams were built in 1918, 1925, 1958, and 1962 respectively. After experiencing multifaceted issues, such as sharp decline in fish population in 1990s, irrigation crisis of 2001, salmon mass mortality of 2002, parties in

Klamath Basin began negotiation for the Klamath Basin Restoration Agreement (KBRA) and the Klamath Hydroelectric Settlement Agreement (KHSA) in 2005. In 2010, both agreements were signed into law. The EIS/EIR for dam removal was issued in 2012. In 2016, Department of the Interior (DOI), Department of Commerce (DOC), the dam operator (PacificCorp), and Oregon and California States signed agreement to remove four dams on the Klamath River by 2020 following a process administered by the Federal Energy Regulatory Commission.

The third case study is about Hantangang flood-control dam in Gyeonggi Province. The dam project was proposed in 1998 after a series of floods of 1996, 1998, and 1999. The dam was designed in 2000; EIS/EIR of the dam was released in 2003. However, President Roh Moo-Hyun ordered to reconsider the project due to the concerns of residents upstream. In 2004, the Presidental Commission on Sustainable Development (PCSD) brought a wide range of stakeholders and attempted to resolve social conflicts in the dam project. PCSD recommended that constructing two washlands and constructing a smaller-size flood control dam as the best option. However, the National Assembly Budget Settlement Committee requested the Board of Audit and Inspection (BAI) to inspect the project. In 2005, the Board of Audit and Inspection (BAI) did an audit of the project; the board pointed out that the calculation of the effect of flood control was incorrect and advised redoing analysis. In accordance with BAI's advice, PCSD transferred the project to the Office for Government Policy Coordination (OGC). OGC organized the Special Committee for Anti-flood measures for Imjin River (SCAI) to conclude the project. SCAI made a final decision to adjust the dam to higher height and to build two washlands. The dam was built in December 2016.

The fourth case is about Youngju multi-purpose dam in Kyungbuk Province. The dam

project was proposed in 1999. Feasibility study of the project was released in 2004, but the project was halted due to the concerns of residents and local politicians and mounting construction costs. In 2006, The Ministry of Strategy and Finance (MSF) redid feasibility study on the project. In 2009, the Ministry of Land, Transport and Maritime Affairs (MLTMA) incorporate the dam in the Four Rivers Project. The dam was designed; EIS/EIR of the dam was released. The dam was built in October 2016.

The fifth case is about Susitna-Watana hydroelectric dam in Alaska State. The dam project has been repeatedly proposed and shelved since 1960s. In 2008, State lawmakers and the Alaska Energy Authority (AEA) ran back over the hydroelectric project as oil prices skyrocketed. The project gathered momentum in 2010 as the Alaska State Legislature adopted a renewable energy goal for Alaska, calling for generating 50 percent of Alaska's electricity from renewable sources by 2025. During 2011, the Alaska State legislature appropriated about $66 million in funds to implement the project. However, the project faced funding cut due to failure of agreements to secure the dam site. The licensing by the Federal Energy Regulatory Commission (FERC) was delayed due to State's spending freeze. In June 2016, Alaska's governor vetoed the project; the project was shelved due to state's ongoing budget crisis and environmental concerns of residents.

The sixth case is about Glen Canyon dam in Arizona State. The dam is located in northern Arizona. It was built in 1966. The economic and ecological effect on the river has been a contentious issue for decades. In 1996, the Glen Canyon Adaptive Management Program started to restore habitats and wildlife populations. There were artificial floods in 1996, 2004, 2008, 2012, and 2014 in accordance with the program. Dam has a fixed future plan for next 20

years in December 2016.

The seventh case is about Yeongyang dam in Kyungbuk Province. In 2009, MLTMA proposed the dam to supply industrial water. MSF and Korea Development Institute (KDI) did pre-feasibility study and concluded that the project is feasible. However, MLTMA changed the dam construction process in 2013. According to the new process, MLTMA should gather public opinion through the Dam Preliminary-Review Council (DPRC) on project first then should do (pre) feasibility study. This rule was applied retrospectively to the dam project. DPRC made a decision to find an alternative without constructing the dam. MLTMA accepted the decision.

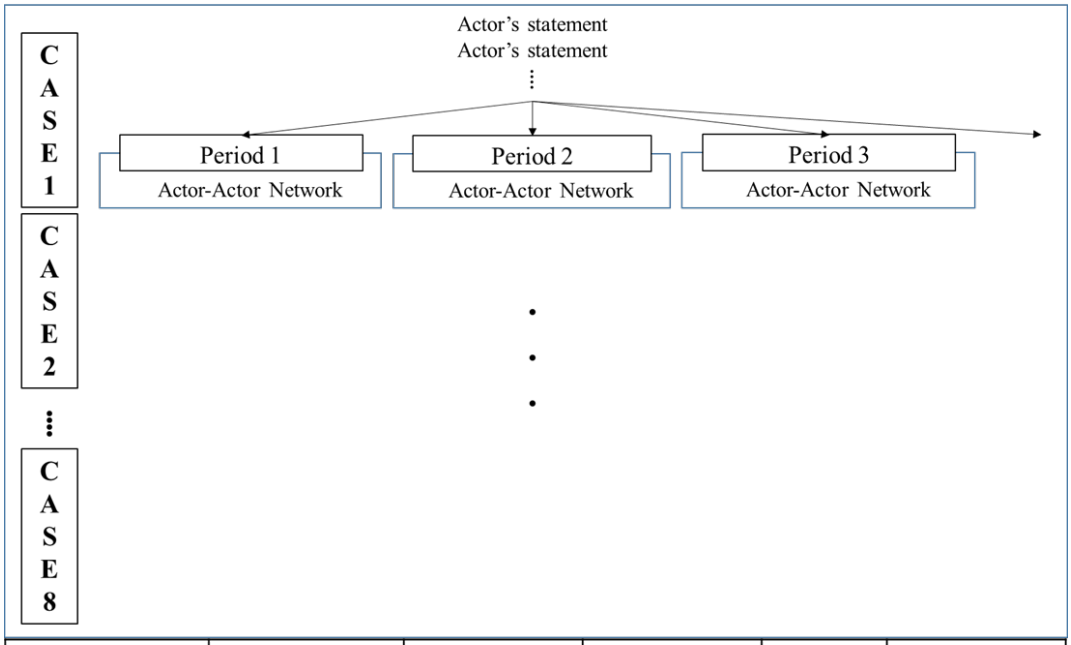
The eighth case is about Garolim Bay Tidal power station in Chungnam Province. The dam project has been proposed since 1980. In 2002, the Ministry of Commerce Industry and Energy (MCIE) adopted a policy goal for South Korea, calling for generating 5 percent of Korea's electricity from renewable source by 2011. In 2005, MCIE designated Korea Western Power (KWP) as an energy provider; KWP prepared feasibility study and EIS/EIR for the project. In 2007, however, Ministry of Environment (MOE) rejected the draft of EIS/EIR; the Ministry of Oceans and Fisheries (MOF) chose the dam site (Garolim Bay) as the most valuable coastal area and declared against the project. Since 2007, MOE had required the project operator to supplement the EIS/EIR three times and had rejected it three times. The project was canceled as MOF designated Garolim Bay as a marine protected area in 2016.

Methodology

General analysis procedure is mapped in figure 1. First, I individually analyzes cases by applying DNA. Through the DNA, actors' statements are arranged network data. An in-depth description

of the DNA is provided in the next section 2. The traditional ACF hypotheses (*H1* and *H2*) are tested within the cases, while the new hypotheses (*H3* and *H4*) are tested through a comparing network centralities between the cases.

Figure 1. The road map for analysis



Data	Methods	Case 1	Case 2	…	Case 8
Coded News Articles	Discourse Network Analysis	*H1, H2*	*H1, H2*	…	*H1, H2*
		H3, H4			

Coding Scheme

The methodology of this paper is based on a mixed method in order to check the results of hypothesis testing. Discourse network analysis (DNA) is employed to test the hypotheses of coalitions and policy actors. The DNA is an integrated method of content analysis and social network analysis (Leifeld & Haunss, 2010). The method will be used for conceptualizing and

measuring the coalition dynamics in the eight cases of policy subsystem. The extracted discourse network data was converted to network data.

To overcome the challenge of collecting data on policy process across different periods and contexts, this paper uses manifestly coded data from 1,322 newspaper articles within selected states/provinces across the two countries. All data were collected between July 2017 and January 2018 by coding articles manually. Each of the articles was coded by one of two coders (the author of this paper and a PhD student assistant) using the software, the Discourse Network Analyzer (Leifeld, 2018). A codebook was developed from the ACF. The codebook includes basic information of each article, such as article identification number, publisher, and word count. Substantively coded contents were indicators of actor's policy core beliefs related to stances on dam construction/removal expressed in the article (a pro versus anti stance); actor's secondary policy beliefs represented in the article. Based on the ACF (Jenkins-Smith et al., 2017; Sabatier & Weible, 2007), I conceptualize the policy core belief as two polarized poles of actor's feeling of certainty that dam construction/removal or status quo in the territory of a subsystem is good; the secondary policy belief is conceptualized as two polarized poles of actor's feelings of certainty that specific instrumental decisions to implement an actor's policy core belief is good. Frequently appeared secondary beliefs across cases were actors' concerns on dam's impact on regional economy, environment impact, capacity to supply electricity and water, and safety. However, the number of secondary beliefs varies by cases.

Several methods were employed in order to warrant inter-coder reliability (Leifeld, 2012). First, coding followed the consensus methods. Results were cross-checked by the second coder, and different views were discussed and revised. Second, a combo box function in the

software was used for categories and actors. The function lets the coder choose from the set of beliefs rather than retyping the beliefs every time, so that the coder avoids typing errors. Third, a search engine for words or sentences associated with each belief was used in the DNA analyzer to check whether statements had been accidently omitted. Fourth, a function reporting self-contradiction of actors was used in the software. A self-contradiction function reports a coding record where the actor uttered his belief on the concept in a positive or negative way. The function was used to distinguish coding errors from change of actors' attitude or their purposive mixed expressions.

Coalition's Stability

The coalition's stability was measured in two ways. First, if an actor within a coalition regularly made a statement (e.g. monthly or annually), the coalition is thought as stable. The second way is to compute an ideological polarization index (Leifeld, 2014). The index is defined as Eq. (1) with non-technical terms.

$$\text{Polarization} = \frac{\text{ID}_{\text{sep}}}{\text{ID}_{\text{sep}}+\text{ID}_{\text{con}}} \quad (1)$$

The ideological polarization index is simplified and implied by analogy.[4] ID_{sep} means the sum of differences in belief between ideologically separated actors at the time of observation while ID_{con} the sum of difference in belief between ideologically similar actors. The index scales between 0 and 1. Values close to 1 show a strong polarization while 0 value means that no or unilateral statement was made.

[4] See Leifeld (2014, pp. 11-12) for a technical definition.

Belief Change

The coded news articles were also used to test the hypothesis of belief change (*H2*). The belief change is measured as a number of change in an actor's stance on a belief. The orientation of the change can be a change from pro to cons stance or vice versa. To analyze whether these beliefs of the coalitions changed over time, I counted the number of belief change by coalition and belief type during selected time periods. Coalition membership was demarcated by sum of policy core belief. For example, if a policy actor expressed a belief on constructing the dam two times in a positive way and three times in a negative way, it was regarded as anti-dam coalition member.

Coalition Actor's Importance

For the eight cases, coalition actors' statements in news articles were converted into an adjacency network where actors are connected to each other via sharing the same belief. The network data also considers the temporal sequence to track transmission of beliefs by time. The sequence is based on the time which was set for each individual news article a statement occurred in. The `NetInf` algorithm was used to tie the coded data into the set of cascades (Gomez-Rodriguez et al., 2010). In sum, I created a total of eight coalition networks directed from sequence. Figure A3 present the coalition networks for the eight cases.

A centrality measure was used to describe actor's importance in a coalition network. A couple of centrality measurement can be used for analysis. The degree centrality is to count an actor's ties to other actors. Presumably an active coalition member in the media would have a high degree centrality value. This measurement is simple but does not describe who made

communicable statements. To capture qualities of coalition actor's ties the eigenvector centrality was used as an alternative. The eigenvector centrality accounts not only for local connections for each coalition actor, the also the degrees of the actors to which it connects overall.[5]

To test the hypotheses of coalition actor's importance in a coalition network (*H3* and *H4*), I model eigenvector centrality using regression models and include dummy variables of coalition opportunity structures and coalition actor's organizational affiliation as independent variables. I also control for eight regions and policy change status. All computations (regression statistics, standard errors, and significance) are performed by the statistical software R (R Development Core Team, 2018). *rDNA* package (Leifeld and Gruber, 2018) is used to compute time-series of annual statement and ideological polarization. I employ *NetworkInference* package (Linder & Desmarais, 2016) to convert the code news articles into coalition networks. I also compute eigenvector centrality values in the network data using *sna* package (Butts, 2016). Table A1 shows summary statistics for the eight coalition networks.

In order to reduce bias and mean squared error associated with regression, I employ the two forms of regression model: an Ordinary Least Squares (OLS) linear regression and Generalized Additive Models for Location Scale and Shape. *gamlss* package (Rigby & Stasinopoulos, 2005) was used for estimation. Model diagnostics for the two models are attached in figures A4 and A5.

Findings: Coalition Stability

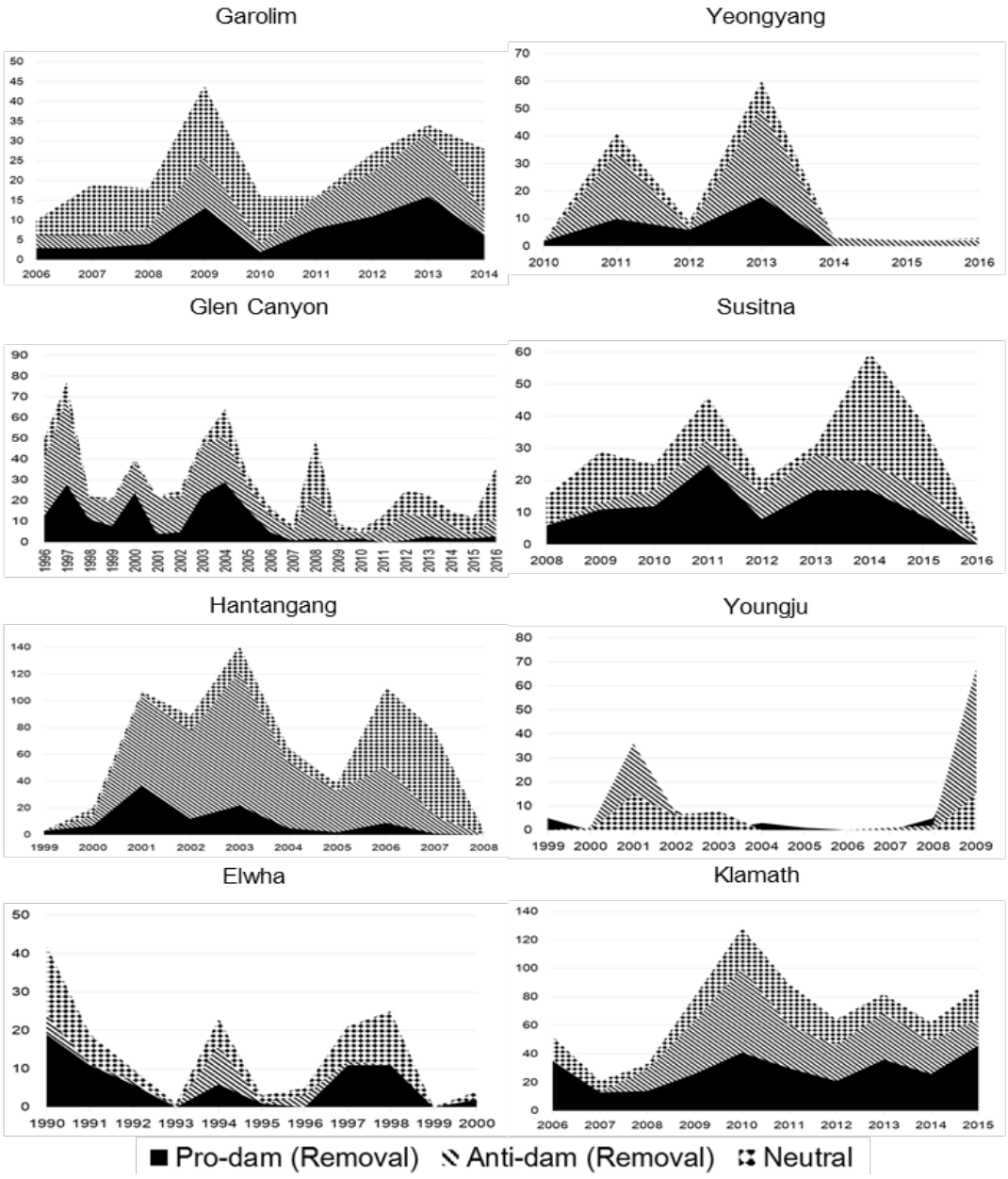
[5] See Bonacich (1987, pp. 1172-1176) for graph-theoretical definition.

Statement by Time

Figure 2 shows how many statements coalitions made over time in the newspaper. Results in figure 2 suggest that a coalition tends to show a steady belief expression across cases except for Youngju and Elwha. Youngju shows that coalition actors rarely made a statement when the dam construction project suspended due to the negative result in financial feasibility. Coalition actors in Elwha seldom generated a statement when the lawsuit was in session 1992-1993. Overall, the fluctuations in the statement are roughly constant in size over time.

There are three possibilities we could to explain these fluctuations. First, they might mean artifacts of newspaper coverage. The news media searches out the main stories of the dams; it goes from pillar to post on the dam construction/removal. Second, the topic itself might fluctuate. Issue attention cycles or framing may guide the accumulation of statements (Leifeld, 2017). For example, people made more statements about Glen Canyon dam's capacity to store and to supply water when they suffer from droughts. Third, coalition is structured or reinforced around beliefs in response to opposite coalition's forming activities. For example, Glen Canyon Institute was founded to advocate decommissioning the Glen Canyon dam in 1996; but Friends of Lake Powell was built to influence policy decisions at an opposite side after a few months. These complex mechanisms aside, the results show that a coalition consistently shows beliefs for about a decade.

Figure 2. Annual Statements by Coalition



Figures A1 and A2 show how many statements individual actors made over time. The first eight charts demonstrate time-series of coalition actors in status quo cases while the next eight charts do for policy change cases. The results in both figures suggest that key coalition actors made a large portion of statements across eight cases.

Table 2 displays another way that the statements of each sub-system are unequally distributed. It demonstrates actual numbers of statement that the top 20% of actors generated. The results say more than a half of statements of each coalition were repeatedly made by less than a half of its actors across eight cases.

Table 2. Attribution to coalition statements

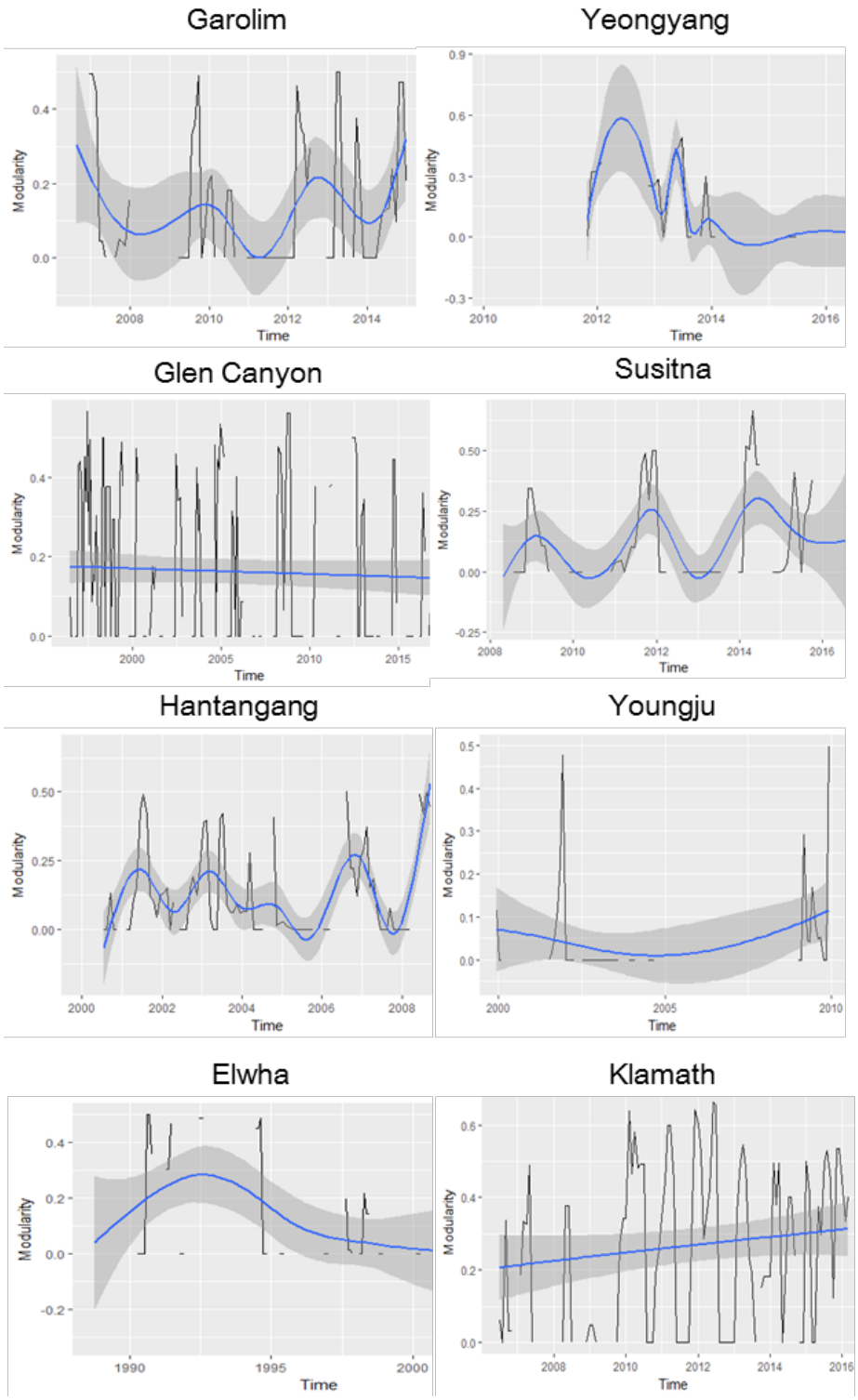
	Status Quo							
	Garolim		Yeongyang		Glen Canyon		Susitna	
Coalition	Pro	Anti	Pro	Anti	Pro	Anti	Pro	Anti
%	87.4	66.11	66.03	73.43	78.21	67.36	68.57	68.62
	Policy Change							
	Hantangang		Youngju		Elwha		Klamath	
Coalition	Pro	Anti	Pro	Anti	Pro	Anti	Pro	Anti
%	92.15	66.98	54.54	61.43	48.45	67.64	57.03	66.37

%: Percentage of total coalition statements 20% of coalition members made

Polarization of Coalition Networks

Figure 3 shows the temporal consequence of coalition network polarization. Y-axis denotes modularity (scales between 0 and 1) while X-axis denotes time. Polarizations in every case show fluctuating patterns varying in amplitudes and periods. Polarizations in Glen Canyon, Hantangang, and Klamath had the most stable value around 0.2 during the whole time period. Polarizations in Garolim and Susitna oscillate intermittently; each wave did not continue more than three years. The cases of Youngju and Elwha are relatively far sparser (longer periods) than polarizations in other cases. Polarization in Yeongyang had the shortest period but more frequent than those of Youngju and Elwha. Overall, figures 2, 3, A1, A2 and table 2 support the first hypothesis that coalitions tend to be rather stable over a period of years.

Figure 3. Time Series of Coalition Networks Modularity Overlaid with Kernel Density Curve



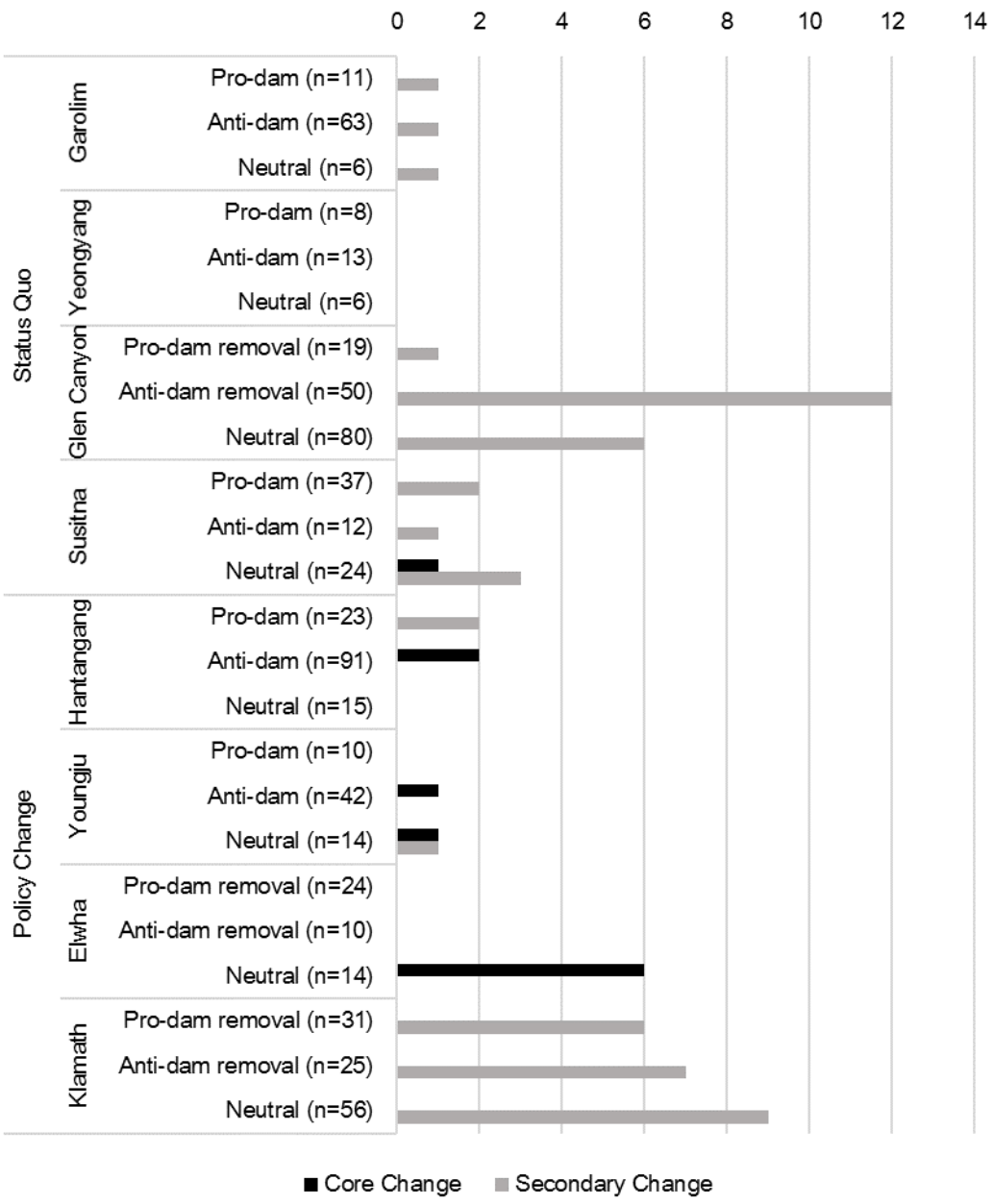
Note: These temporal sequences were computed with timewindow function for temporal smoothing. See Leifeld (2014) for the technical explanation.

Findings: Belief Change

My second expectation is that coalition actors across sub-systems tend to change their secondary beliefs before changing their policy core. Figure 4 shows the results from the analysis of coalition's belief change. The first twelve rows of the chart show the number of belief change for two opposing coalitions and neutral group regarding the policy core belief of whether to construct/removal the dams and the secondary aspects across the cases of status quo. The cases of status quo strongly support the hypothesis of belief change. A change in the policy core belief occurred in the case of Susitna-Watana dam. Bill Walker, the governor of Alaska, shifted his stance from pro to anti dam construction with the change in the secondary belief on budgeting for dam construction twice (anti → pro → anti).

The last twelve rows of figure 4 show the number of belief change for the cases of policy change. Three of the four cases do not bear out the hypothesis of belief change. Policy actors in those cases showed changes in the policy core belief without expressing any change in a secondary belief. The results of the hypothesis testing did not show a variation in coalition opportunity structure. Overall, figure 4 demonstrates a mixed support for the hypothesis about belief change (*H2*).

Figure 4. Count of Belief Change



Findings: Actors' Importance in Coalition Network

My third and fourth expectations are that government agencies and non-profit organizations in a less open political system are likely to be more important than those in more open system. Figure 5 shows eigenvector centrality distribution of the eight cases. The statement

distributions are seen as approximately Pareto distributions which have heavy tails.[6] When the unequal distribution of coalition actors' statement was combined, ties between coalition actors have characteristics of a scale-free network (Barabasi & Albert, 1999) on which a small number of actors have the relative popularity or influence that far exceeds the average.

Figure 5. Eigenvector centrality distributions of the eight cases

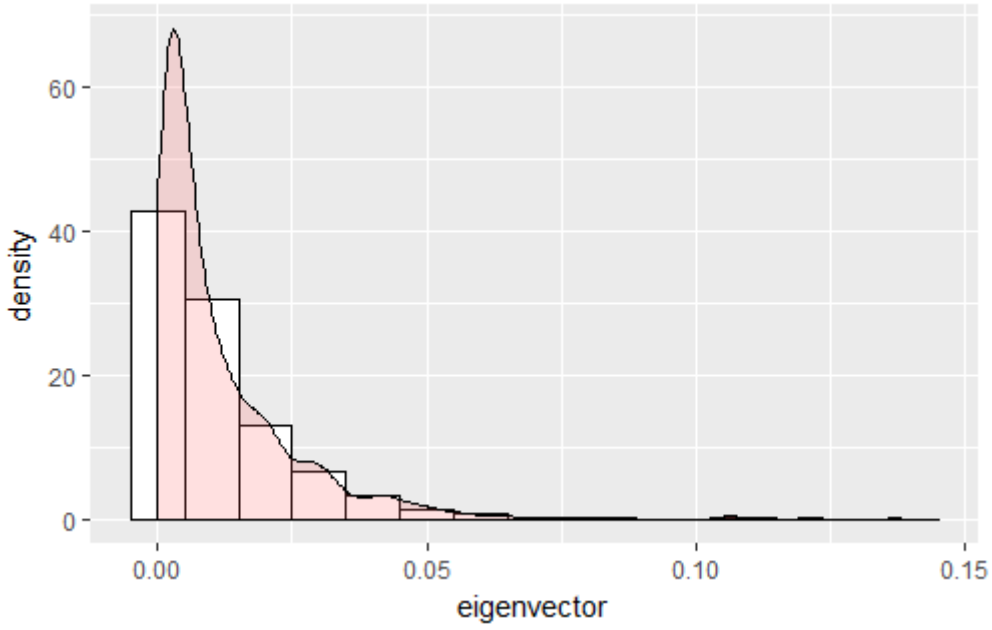


Table 3 shows the estimated parameters for multivariate regression models for policy actor's eigenvector centrality. Model 1 is built from the linear regression model while model 2 is built from the generalized additive model for Pareto II type distribution. The model 1 is given by

[6] Log-Likelihood-based statistics, such as Global Deviance, Akaike's Information Criterion (AIC), Bayesian Information Criterion (BIC), were considered to find best-fit distribution. See Rigby et al. (2017) for fitting the best distribution and basic properties of Pareto type 2 distribution.

$Y \sim \text{Normal}(\hat{\mu}, \hat{\sigma})$ where $\hat{\mu} =$ 0.032, $\hat{\sigma} =$ exp(-4.329) = 0.013 while model 2 is given by $Y \sim \text{Pareto}(\hat{\mu}, \hat{\sigma})$ where $\hat{\mu} =$ exp(-2.94) = 0.05, $\hat{\sigma} =$ exp(1.194)=3.3. Model 1 fits more poorly the data than model 2 does; Model 1 is inferior to model 2 in the values of Global deviance, Akaike's Information Criterion (AIC), and Bayesian Information Criterion (BIC). Moreover, residual diagnostics for model 1 (appendix) show that the model violates the assumptions of a linear regression model. Notwithstanding these fitting problems, estimated parameters in model 1 closely mirror the result of model 2 in terms of their significance and direction. Hence, model 1 will be sufficient to confirm my expectations here. However, I will examine the result from model 2 for discussion because the results are not similar for magnitude.

The models could not find a difference in influence between non-profit organizations in the two political systems. Korean central and American federal government agencies either did not show any difference in eigenvector centrality. On the other hand, Korean provincial governments are likely to have a higher eigenvector centrality than American state governments (49.9% = exp(0.958-0.553)-1); this was significant at $p < 0.05$. Local governments are likely to have a higher eigenvector centrality than other organizations (23.6% = exp(0.765-0.553)-1). This was significant at $p < 0.05$. These findings offer a mixed support for the hypothesis that *The less openness the political system has, the more important government agencies are in the coalition network*. However, the findings do not offer any support for the hypothesis that t*he more openness the political system has, the less important NPOs are to the coalition network.*

Table 3. Multivariate Regressions of Policy Actor's Eigenvector Centralities

	Model 1		Model 2	
	Coef.	S.E.	Coef.	S.E.
Policy Decision				
Policy Change	-0.023***	0.003	-0.772**	0.293
Case				
Garolim Bay Tidal Power Generation	0.025***	0.003	0.711	0.181
Glen Canyon Dam	-0.025***	0.003	-0.415*	0.16
Susitna Dam	-0.016***	0.004	0.685***	0.199
Hantangang Dam	-0.008***	0.002	-1.02***	0.176
Elwha Dams	0.013***	0.002	0.881***	0.223
Coalition Opportunity				
Recent_Pluralistic	0.003	0.003	-0.553*	0.236
Organizations				
Non-Profit	0.001	0.002	-0.041	0.25
Recent_Pluralistic × Non-Profit	0.004	0.004	0.003	0.256
For-Profit	-0.003	0.002	-0.358	0.26
Federal (Central) Government	0.006*	0.003	0.385	0.298
Recent_Pluralistic × Federal Government	0.004	0.004	0.294	0.343
State (Provincial) Government	0.001	0.003	-0.016	0.295
Recent_Pluralistic × State Government	0.015***	0.004	0.958*	0.403
Local Government	0.001	0.003	0.123	0.306
Recent_Pluralistic × Local Government	0.015***	0.004	0.725*	0.375
Political_Party	-0.001	0.002	-0.189	0.25
Constant	0.032***	0.004	-2.94***	0.421
Sigma			1.194***	0.172
N	661		661	
Adjusted R^2	0.2616			
Global Deviance	-3847.885		-4691.677	
AIC	-3809.885		-4653.677	
BIC	-3724.503		-4568.296	

Notes: The dummy variables which indicate an actor belongs to Yeongyang or Youngju are omitted in model 1 due to multi-collinearity problem. The base group is the case of Klamath. For organization variables, the base group is actors in other categories such as academia, tribe, etc. *, **, and *** indicate statistical significance at the 0.05, 0.01, 0.001 levels (two-tailed).

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Appendix

Figure A1. Annual Statements by Policy Actor (Status Quo)

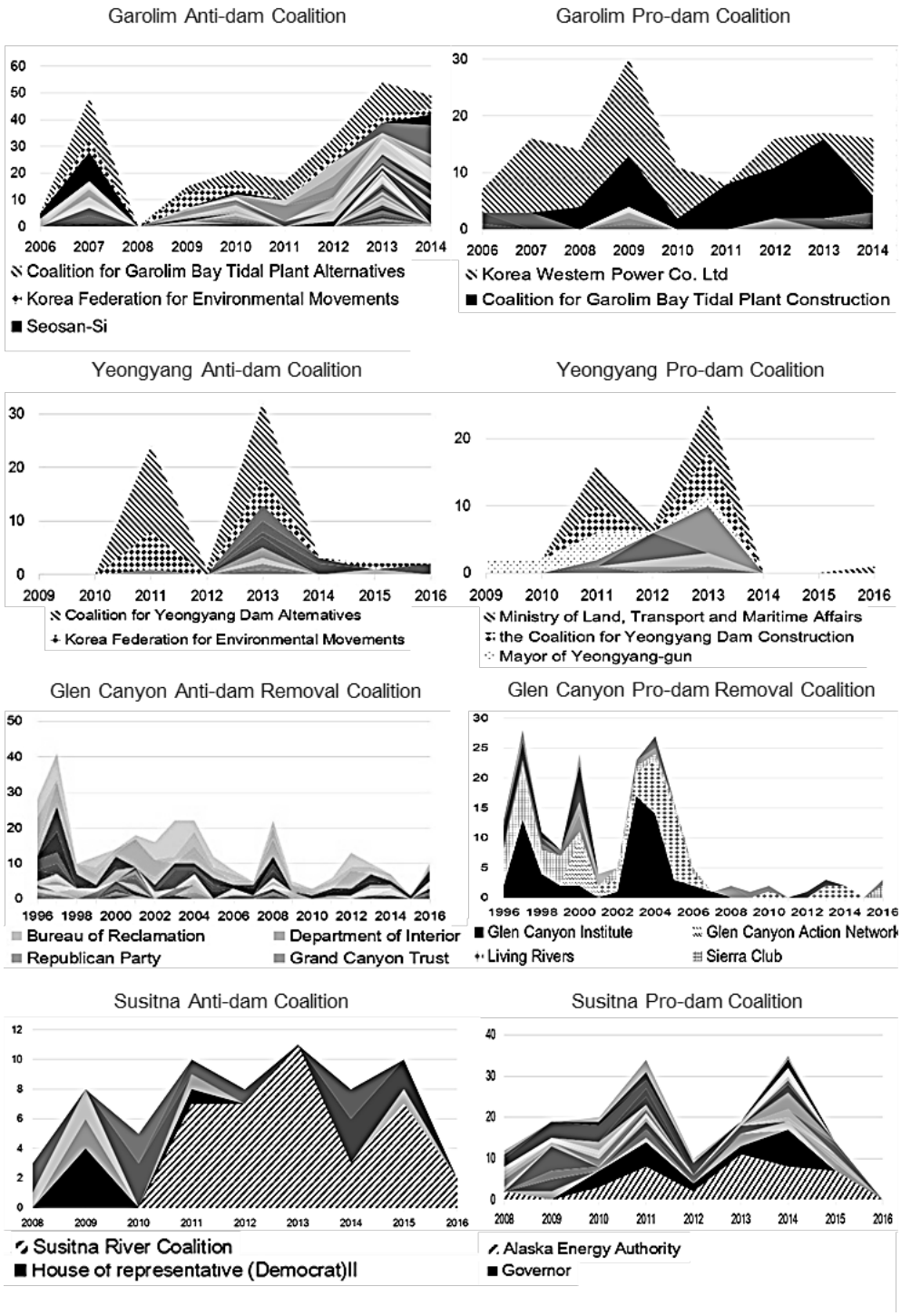


Figure A2. Annual Statements by Policy Actor (Policy Change)

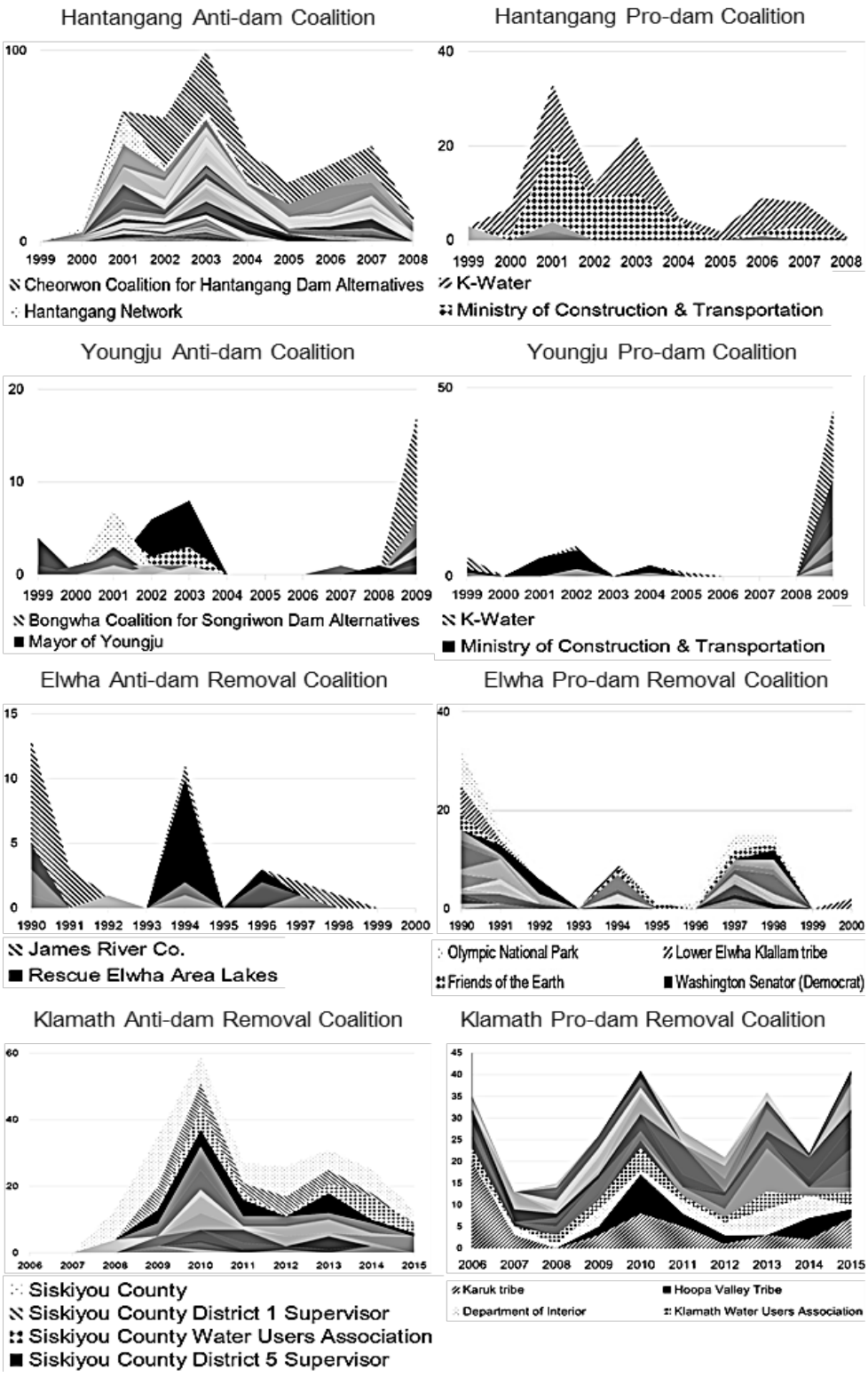


Table A1. Summary Statistics for Coalition Networks

	Status Quo				Policy Change			
	GA	YY	GL	SU	HA	YJ	EL	KL
Nodes	80	25	145	66	128	65	44	108
Edges	141	41	288	113	300	117	82	294
Density	0.022	0.068	0.014	0.026	0.018	0.028	0.043	0.025
Mean degree	1.763	1.64	1.986	1.712	2.344	1.8	1.864	2.722
Mean Clustering Coef.	0.064	0.124	0.035	0.089	0.067	0.077	0.087	0.094
Centralization								
Mean eigenvector	0.013	0.04	0.007	0.015	0.008	0.015	0.023	0.009
Median eigenvector	0.006	0.019	0.003	0.012	0.004	0.008	0.015	0.006

GA: Garolim Bay Tidal Power Generation; YY: Yeongyang Dam; GL: Glen Canyon Dam; SU: Susitna-Watana Dam; HA: Hantangang Dam; YJ: Yeongju Dam; EL: Dams in Elwha; KL: Dams in Klamath

Figure A3. Coalition Networks

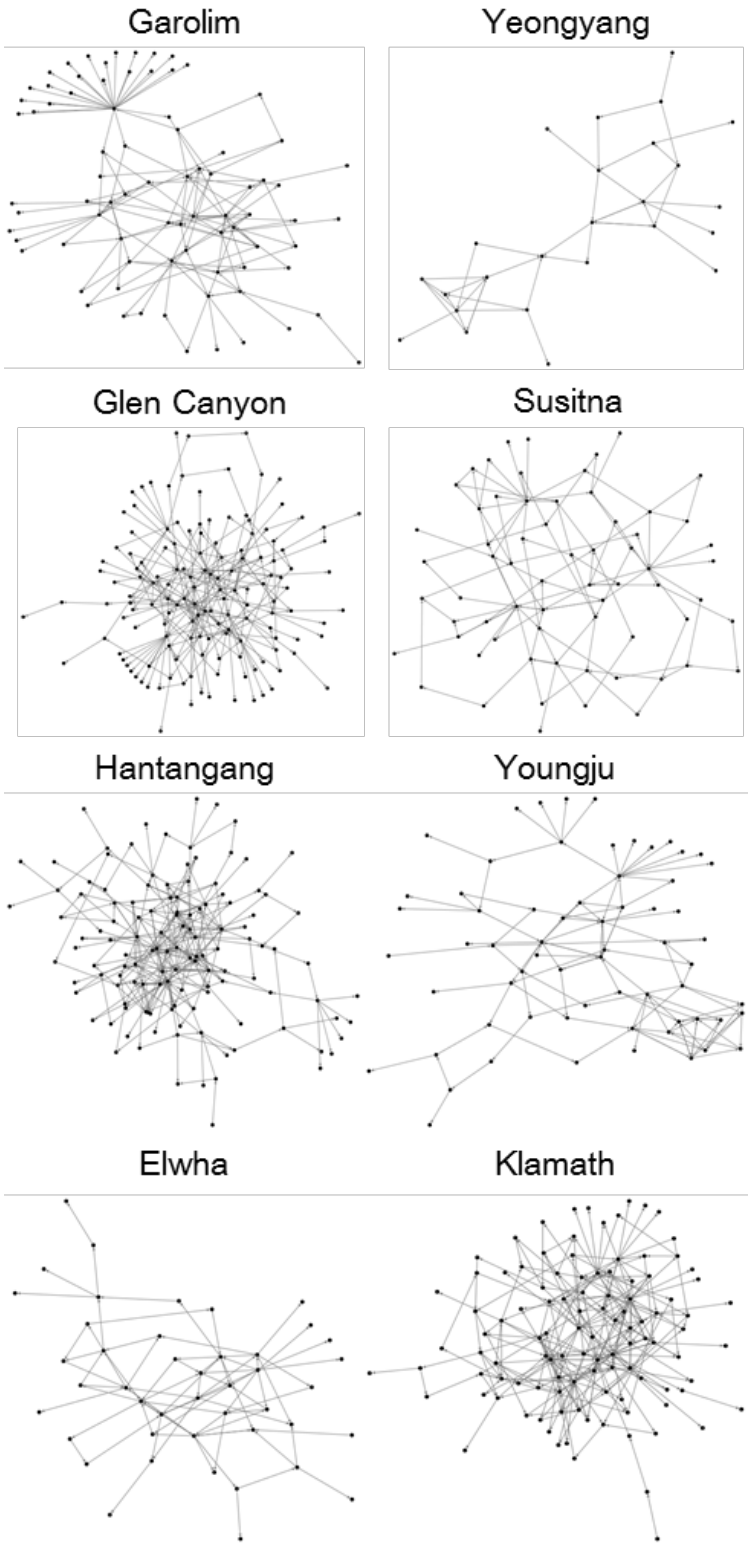
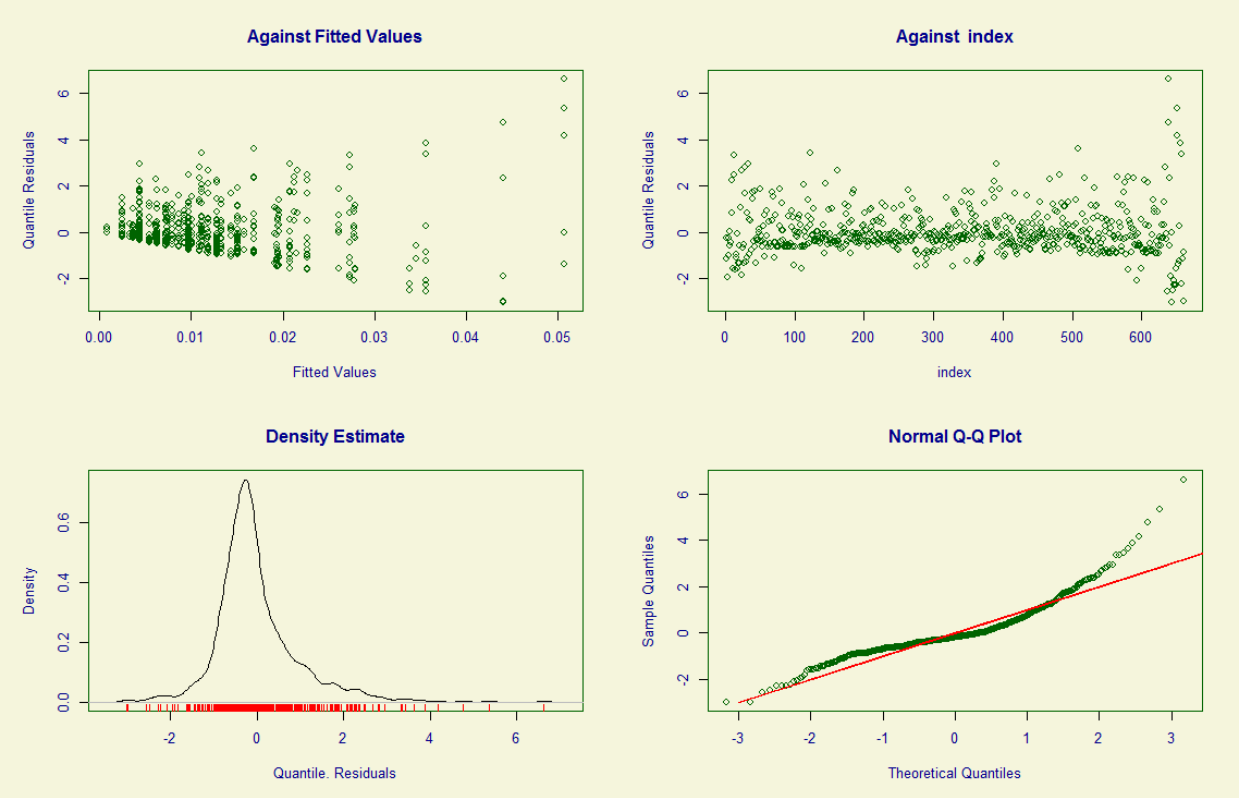
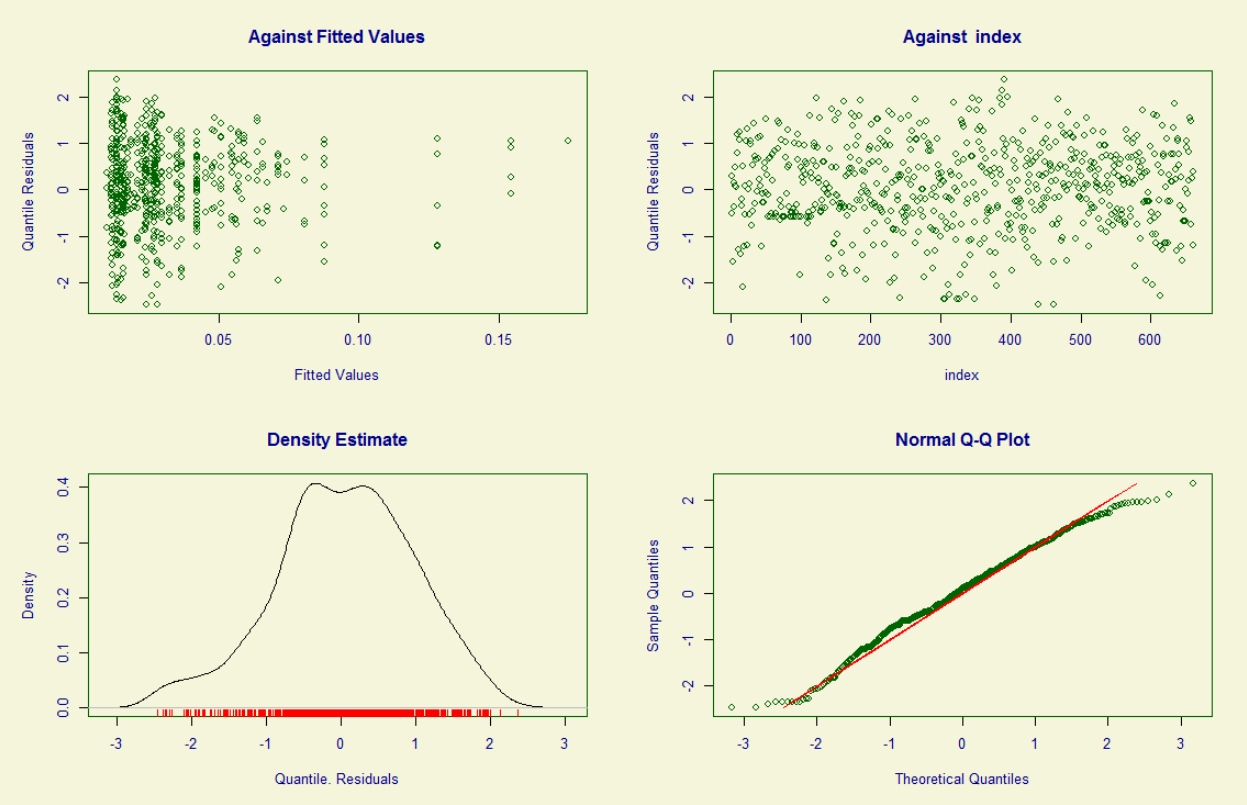


Figure A4. Residual Diagnostics for Model 1 (Linear Regression Model)



Summary of the Quantile Residuals	
Mean	-0.00000000051973
Variance	1.002
Coefficient of Skewness	1.585
Coefficient of Kurtosis	9.066
Filliben Correlation Coefficient	0.937

Figure A5. Residual Diagnostics for Model 2 (Generalized Additive Model for Pareto 2 type distribution)



Summary of the Quantile Residuals	
Mean	0.055
Variance	0.858
Coefficient of Skewness	-0.262
Coefficient of Kurtosis	2.88
Filliben Correlation Coefficient	0.995