Institutional Design, Public Participation, and Their Consequences for Watershed Governance

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Abstract

Given the focus on the management of local resources, it is challenging for studies of the commons to deal with complex issues in watershed governance on a larger scale. Recently, attention has been given to the importance of multilevel environmental governance. However, there is still no clarity on the kinds of institutional arrangements and public participation desirable for sustainable watershed governance.

In this study, based on the previously developed institutional analysis theory on the commons and environmental governance, we construct a framework for analyzing the relationship between institutional design and public participation in river basin planning and these factors' impacts on this type of planning.

This study examines the management of Japan's Watershed Committees, which were established by the amendment of the River Law in 1997. In Japan, rivers governance had traditionally been highly state-centered, especially after World War II. Because of such technocratic governance, residents along rivers experienced alienation. This caused serious conflicts between residents and bureaucrats over river development projects such as dam construction, and local communities and the environment were both adversely affected. To cope with this situation, a new public participation procedure was introduced in the River Law of 1997. Based on this amendment, several Watershed Committees were established during the planning process for each river.

Here, we analyze the Watershed Committees quantitatively, based on the institutional analysis theory mentioned above. First, we construct a dataset describing the institutional design of the Watershed Committees, types of public participation, and established river plans for 109 Class-A rivers. This dataset is then used for multiple-regression analysis to explore the relationship between institutional design, public participation, and planning consequences. This analysis thus helps identify some of the implications of institutional design and public participation for the purposes of developing more sustainable watershed governance.

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Keywords: Public participation, watershed governance, institutional design, regression analysis

Introduction

It has been increasingly acknowledged that participation and collaboration are important in environmental decision making (Beierle and Cayford 2002, Wondolleck and Yaffee 2000). In particular, the linkages and coordination between horizontal and vertical spatial scales are regarded as essential subjects of scrutiny when assessing environmental governance (Berkes 2002). Although the importance of public participation in environmental governance is generally recognized, means of optimally enshrining the participatory process into institutional design have yet to be elucidated. This article examines how different models of participation in institutional design affect environmental governance, particularly watershed management.

The paper is structured as follows. First, existing literature on the institutionalization of public participation is examined. Then the present institutional framework of river planning in Japan is briefly introduced as the specific case taken up in this study. Based on the first two sections, a hypothetical framework for analyzing the relationship between the institutional design for a participatory planning process and its results is presented. The analysis then examines the factors affecting the output of the planning process using Poisson regression analysis. Finally, the last section discusses the findings and draws some conclusions for improving participatory planning processes, providing suggestions for future research.

Literature review: Analytical approaches to the study of institutions for public participation

The seminal work on public participation is Arnstein's "A ladder of citizen participation" (1969). It has been the most frequently cited in the field of participation studies, offering normative guidelines for evaluating the level of public participation in a given scenario. However, Arnstein's normative framework does not prove helpful when empirically analyzing the relationship between a given participatory planning process and its outputs.

The Institutional Analysis and Development (IAD) framework was developed by Elinor Ostrom and her colleagues (Kiser and Ostrom 1982; Ostrom 1990) for analyzing complex interactions between institutions and human behaviors in field settings. This framework is composed of three contextual factors (physical world, community, and rules), an action arena, patterns of interactions, and outcomes. It has been used to examine natural

resource governance, including the role of participation in river basin management (Mokhtar et al. 2011), ecosystem-based management (Imperial 1999), participation in land use planning (Koontz 2005), and so on. These studies have indicated that the IAD framework allows researchers to successfully examine the effect of a number of complex factors during a given planning process on its outputs and outcomes. However, given the fact that public participation in environmental planning is often organized by governmental agencies, we need to include the role of government in the IAD framework to fully analyze the participatory process. Koontz et al. (2004, 2006) further developed the IAD framework to include the effect of government for the analysis of collaborative environmental management. Unfortunately, governmental actors do not always support or proactively invite participation or collaboration. Thus, we need to include not only the effect but also the action strategy of governmental actors when analyzing participation using the IAD framework.

Harada (2011) examined how bureaucrats in national government agencies in Japan respond to public comments. Several analytical hypotheses about bureaucrats' behaviors are presented in his paper. The first, the "broadly responsive bureaucrats hypothesis," holds that government agencies are responsive not only to specific interest groups that have daily contact with government officials, but also to various stakeholders such as NPOs/NGOs, academic experts, and citizens in general. Harada presents a second: the "logic of appropriateness hypothesis." March and Olsen (2006) discussed that members of a given organization act so that their behavior matches the group's informal rules, routines, and norms. This logic is often discussed in opposition to the "logic of consequence." In the analysis of public comment procedure, it is hypothesized that, if government officials in charge of public comment are technocrats, they will not be so responsive due to the stable norms and identities shaping their behavior. Finally, Harada presented empirical evidence for the "prenotice hypothesis." West (2009) indicated that when opinions are collected through an unstructured prenotice procedure, held prior to the official public comment procedure, the number of comments voiced during the official procedure decreases.

The target of this study: The Japanese Watershed Committees' River Improvement Plan and planning process

The governance structure for rivers in Japan has been mostly defined by the River Law (Ohno, Tanaka, and Sakagami 2010), according to which either the national or the prefectural governments function as river administrators. In 1997, public participation procedures were newly introduced into the planning process underlying Japan's River Improvement Plan, which is the official plan, including specific project plans and spanning

20 to 30 years. According to Article 16-2 of the River Law of 1997: “River administrators shall take necessary measures, such as public hearings, etc., to reflect the voices of people concerned.” Due to this newly introduced provision on participatory planning, Watershed Committees have been established by river administrators to discuss draft River Improvement Plans (RIPs) jointly with academic experts and local experts. Japan’s Watershed Committees are expected to be effective mechanisms for ensuring that official plans reflect the voices of local stakeholders. On the other hand, there has been some criticism that these new participatory procedures are merely symbolic gestures.

Using the IAD framework, this study conceptualizes Watershed Committees as action arenas located at the collective choice level. Major actors in watershed committees are academic experts, Fishery Cooperative Associations, Land Improvement Districts, environmental NGOs/NPOs, and local government mayors (Ohno 2012). Preferences for each actor are supposed to be as follows. If Fishery Cooperative Associations (FCA) operate a fishery in the affected river, they will demand environmental conservation measures against river development projects. Land Improvement Districts (LID) will demand both quantity and quality of water for irrigation use. Environmental NGOs/NPOs are generally aware of environmental conservation measures and will demand them. Municipal mayors will support development projects; meanwhile they will demand environmental conservation measures for reducing and mitigating attendant adverse effects.

As described above, the influence of river administrators over the planning process seems to be stronger than that of any other actors in the Watershed Committees. Satoh (2009) argued that river administrators exert strong power as “veto players” during the participatory planning process governing an RIP. Bureaucrats in the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) are generally said to first try new projects at the local bureau level then to translate some of the successful local projects into national-level policy (Shiroyama, Hosono, and Suzuki 1999). This principle holds true for the planning process associated with RIPs. The detailed procedures of the RIP planning process are not defined in law, but rather have been devised and modified in some watersheds. Some Watershed Committees were also established prior to the Basic Plan for River Improvement defined at the national level (Ohno 2012).

With regard to the “logic of appropriateness hypothesis,” the norms and guiding behavioral principle of Japanese watershed planners seem to have changed since their experience with the Yodo River Watershed Committee. Just after the amendment of the River Law in 1997, MLIT appeared to actively court public participation. However, since the Yodo River Watershed Committee recommended that river administrators should not construct

dams wherever possible in 2003, the attitudes of MLIT have drastically shifted against public participation (Miyamoto 2012).

Based on the previous literature and the present institutional features of the RIP planning process, the analytical framework and hypothetical relationships proposed in this study are pictured in Figure 1. The awareness of stakeholders is affected by contextual variables such as land use. The structure of an individual action arena, including the membership composition of Watershed Committees, will affect the degree of demand for a given RIP. Whether the voices of stakeholders are actually incorporated into the final plan will be determined by the river administrators' strategy.

[Figure 1 here]

Data and Methods

Data on the institutional design of each Watershed Committee is collected from their respective Web sites or official documents (Ohno 2012). To evaluate the results of the participatory process, we assess the number of revisions between the draft version of the RIP and final version of RIP as a relevant indicator. This is just a second-best means of evaluating the output of the participatory process; tangible environmental improvement is really the key goal of environmental policy and decision-making (Niles and Lubell 2012). However, we adopt this index because it constitutes a measurable standard across a number of watersheds. Using the officially documented comparison tables between first draft and final plan for each river, we document the number of revisions. We could find three patterns of revision: namely, substantial revision, mitigated revision, and environmental revision. Substantial revision refers to concrete changes to the project, except revisions of fact or other errata. Revision with regard to environmental conservation is categorized into two patterns. One is defined as mitigated revision, which is revision aimed at reducing or mitigating negative environmental impacts associated with river development projects (e.g., the introduction of a river environment improvement project to offset the negative effects of dam construction). The other is defined as environmental revision, which is substantial revision for river environmental conservation other than mitigated revision.

The targets of this analysis are 109 Class-A rivers in Japan. Since the number of Watershed Committees that have made comparison tables of RIP drafts is limited, the sample size is limited to 40 rivers.

Descriptive statistics are summarized in Table 1. We then examine which process factors affect the number of the three types of revisions for each plan using regression

analysis. Taking the fact that dependent variables are non-negative count data into account, Poisson regression analysis is used to identify and model significant variables explaining the outputs of the participatory process. Three kinds of regression models map onto the three different types of revision: Model 1 for the number of substantial revisions; Model 2 for the number of mitigated revisions; and Model 3 for the number of environmental revisions.

[Table 1 here]
[Table 2 here]

Results

The results of regression analysis are shown in Table 2. Explanatory variables for Committees' membership composition show opposing effects. Variables on the percentages of LID and mayors are positively significant in the substantial revision model, but only the percentage of mayors is significant in the mitigated revision model. Surprisingly, the FCA variable is negatively significant, contrary to the hypothesis that it should be positively significant. The reason for this negative effect needs to be further examined in a detailed analysis. Likewise, contrary to the hypothesis, the NPO variable did not have any significant effects. These results pertaining to membership indicate that, although the voices of actors with some kinds of rights over the river in question (i.e., water use rights) are reflected in the plan, voices of those who do not have such rights are not well included in the final RIP.

Next, we will examine the results pertaining to the explanatory variables for river administrators' strategies. The number of meetings variable is positively significant in each model, indicating that the more often stakeholder voices are heard, the more responsible river administrators are. Given the result that only the NPO variable is not significant in every model, this result also suggests perhaps that the quality of public comment improved as more meetings were held, possibly affecting river administrators' judgments about plan revisions. On the other hand, the variable concerning the "logic of appropriateness hypothesis" is not significant except for the 2006 dummy in Model 1. The "prenotice hypothesis" variable is negatively significant in each model.

Conclusion

In this paper, we have examined the relationship between institutional design and public participation and its consequences, with emphasis on the effects of the membership composition of action arenas and river administrators' strategies. The results of regression analysis suggest that the voices of actors who have both wide and shallow interests, like

environmental NPOs, are not well reflected in the planning process. The results also indicate that river administrators are responsive to public participation to a certain extent. However, there are certainly cases in which river administrators have been quite reluctant to fold public comment from the participatory process into final RIPs. Especially in cases of proposed dam construction, planners seem to be more unwilling to include the voices of participants into the final plan. Although we could not find such a tendency in the quantitative analysis, we still need to examine bureaucrats' behavioral principles with respect to public participation. The current study and these suggested analyses will offer useful insights into improving the institutional design of watershed governance.

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Figure 1. Analytical framework for this study

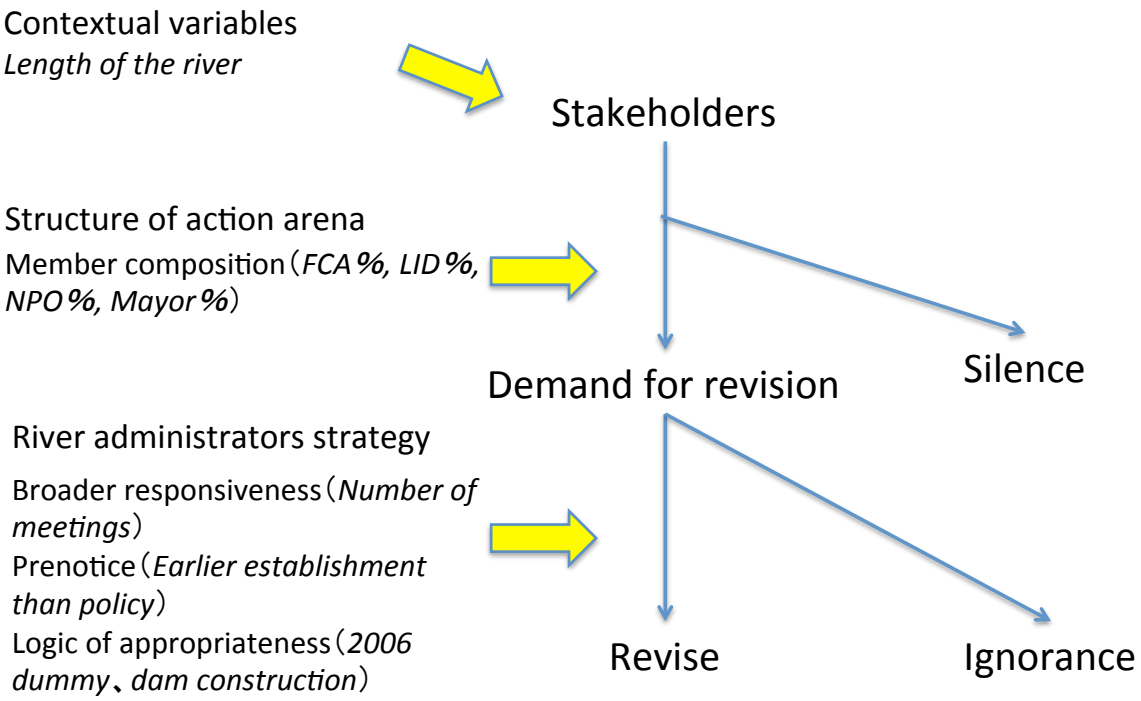

Table 1. Descriptive statistics for each variable

	Max.	Min.	Avg.	Sd.	Hypothetical Effects
Substantial revision	19.00	0.00	4.15	5.01	
Mitigated revision	6.00	0.00	0.88	1.49	
Environmental revision	6.00	0.00	0.85	1.53	
Length of river (kms)	2727.50	71.70	620.19	637.72	+
FCA%	0.15	0.00	0.03	0.04	+
LID%	0.15	0.00	0.03	0.04	+
NPO%	0.25	0.00	0.06	0.07	+
Mayor%	0.50	0.00	0.10	0.13	-
Number of meetings	20.00	2.00	6.10	3.69	+
Before 2006	1.00	0.00	0.58	0.50	+
Dam construction	1.00	0.00	0.33	0.47	-
Before the policy	1.00	0.00	0.18	0.38	-

Table 2. Results of regression analysis

	Substantial Revision			Mitigated Revision			Environmental Revision		
	Coef.	Std.		Coef.	Std.		Coef.	Std.	
(Intercept)	0.650	0.217	**	-1.360	0.567	*	-1.504	0.511	**
Length of river	0.000	0.000	*	-0.001	0.001		-0.001	0.000	
FCA%	-6.022	2.529	*	0.930	5.774		-17.260	8.633	*
LID%	5.679	2.018	**	2.795	5.429		6.443	4.715	
NPO%	0.422	1.258		1.526	3.409		2.358	2.749	
Mayor%	1.533	0.757	*	3.485	1.746	*	0.181	2.031	
Number of meetings	0.080	0.021	***	0.112	0.046	*	0.199	0.054	***
Before 2006	0.675	0.212	**	0.366	0.498		0.845	0.516	
Dam construction	-0.048	0.223		0.672	0.535		-0.314	0.539	
Before the policy	-1.756	0.368	***	-2.174	1.030	*	-1.798	0.777	*
Log likelihood	-121.037			-42.879			-43.383		
Pseudo R2	0.174			0.139			0.139		
Number of observations	40.000			40.000			40.000		

Note: ***p < 0.001, **p < 0.01, *p < 0.05