A Study on the Analysis of the Success Factors of Collaborative Governance and a Plan for Activation: Focusing on the Case of Improving the Water Environment of Bohyeonsan Dam Through Residents' Participation

By

BAIK, Mina

CAPSTONE PROJECT

Submitted to

KDI School of Public Policy and Management

In Partial Fulfillment of the Requirements

For the Degree of

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Committee in charge:

Professor Kim, Dong-Young, Supervisor

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Professor Liu, Cheol

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Abstract

As civil society grows and civil consciousness matures, citizens' desire to participate in politics and their expectations for the government have risen rapidly across the world. Now, citizens are not just objects to governing or the policy beneficiaries, as they actively participate and collaborate in the entire stage of policy. The main form in which this is realized is "governance". Since the 2000s, research and application of collaborative governance have been actively conducted, and practical communication and active participation of stakeholders is considered important, and in particular, active interest and participation of citizens are the most important. This is because citizens' participation leads to practical communication between the government and the people, and increases the acceptance of the policy and reliability of the government, which determines the success of the policy. In addition, due to the scalability of mutual communication and trust-building, this collaborative governance enables the establishment of a friendly support base in the mid to long term, and in that respect, it is also linked to customer relationship management. As the government confirmed the unification of water management in 2018 in South Korea, K-water has expanded its business area from the existing management of water quantity to water quality and ecosystem. Accordingly, K-water has intended to attempt various measures in the Bohyeonsan Dam as a testbed of the enhancement of the water environment in the upper stream basin of the Dam and included measures involving residents of the upper stream basin. Bohyeonsan Dam governance is highly praised not only in K-water internal performance evaluation but also externally as it has shown that residents have been directly participating in the implementation of the water environment. This study analysed the success factors of collaborative governance through the case of Bohyeonsan Dam Governance, which is the first case where residents have participated in improving the water environment of the upper stream basin of the Dam in K-water. After constructing an analysis frame deductively from common success factors presented in previous studies on collaborative governance such as Ansell & Gash (2008), I would like to apply it to the Bohyeonsan Dam governance case, and also derive additional success factors. Based on the success factors derived from Bohyeonsan Dam governance, I would like to emphasize the residents' participation, and also presented measures to revitalize collaborative governance at the K-water site for sustainable win-win development with residents.

Keywords: collaborative governance, resident participation, interactive communication, trust building, customer relationship management (CRM), Bohyeonsan Dam

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1. Introduction

As civil society grows and civil consciousness matures, citizens' desire to participate in politics and their expectations for governments and institutions have risen to a significant level. Now, citizens are not just the objects of governing or the role of beneficiaries of policies but are playing a role as an active actor in which citizens actively participate and collaborate in the whole stages of policymaking, implementation, and feedback for themselves. A various form of governance is the way to realize their participation, and no exaggeration to say that modern society is a society of governance. There are various opinions on the definition of governance, but it is generally understood that various stakeholders are consultative bodies to solve common problems. Since the 2000s, research and application of collaborative governance have been actively conducted, which had started with criticism of the one-sided top-down method and undemocratic problem-solving method in a traditional bureaucracy. In collaborative governance, it can be said that the actual communication and active participation of stakeholders are considered important, and in particular, the active participation of citizens is the most important. This is because citizens' participation leads to practical communication between the government and the people, and increases the acceptance of the policy and reliability of the government, which determines the success of the policy. Furthermore, this collaborative governance is also linked to customer relationship management in that it is possible to build a friendly support base in the mid to long term due to the scalability of mutual communication and trust-building. This study aims to analyse the success factors of collaborative governance through the case of improving the water environment of Bohyeonsan Dam managed by K-water with resident participation. To this end, an analysis frame will be constructed deductively from common success factors presented in previous studies on collaborative governance such as Ansell & Gash (2008) and applied to the Bohyeonsan Dam governance case. Furthermore, while emphasizing the participation of residents, I would like to present a plan to revitalize K-water collaborative governance for sustainable win-win development with residents.

2. The theoretical background of collaborative governance and participatory governance

2-1. The concept of governance

It is no exaggeration to say that modern times are an era of governance. Governance could be seen as a product of the problem of government inefficiency and the rapid development of civil capacity following the emergence of civil society under the traditional bureaucratic paradigm (Lee, 2017). Governance has been widely used as a term meaning something new and reformed regarding government or administration (Lee, 2017). According to Rhodes (1997), a representative advocate of governance theory, governance is viewed as a new process, new conditions of ordered rules, and new ways of social governance. Stoker (1998) presents five characteristics of governance as follows: 1) not only the government but also private actors and institutions participate in solving public problems, 2) the boundaries of responsibility become ambiguous to solve social and economic problems, 3) the relationship of power dependence among institutions regarding group action is important, 4) there is actors' independent network, 5) the ability to solve social problems without relying on the government. Meanwhile, Ostrom (1990) referred to governance as solving the problem of public goods by various collective actions. According to Ostrom (1990), governance does not mean to reign or govern, but to solve problems, and governance as a solution to social problems through voluntary collaboration was presented (Lee, 2017). As such, there are various interpretations of the meaning of governance, but the substance of governance can be said to be a way to solve social problems through collaboration by a number of stakeholders, and I think the most important concept is "collaboration".

On the other hand, even if it is based on the view government or local government must be included, public companies are contained in stakeholders. Because public companies are for the concrete implementation of government policies, public problems that the government has to solve can naturally connect to public companies that have been given roles in each field. Therefore, the Korea Water Resources Corporation (Article 1 of the Korea Water Resources Corporation Act), aimed at comprehensively developing and managing water resources for improving citizens' livelihoods and enhancing public welfare by ensuring a smooth supply of water, can be recognized as a stakeholder regarding the public problems such as water resources or water quality. In addition, Ostrom (1990) stated that voluntary collaboration can

solve social problems without government intervention. There will be no disagreement on recognizing public and private companies as one of the stakeholders of governance in that private companies also actively build and utilize governance as an extension of customer relations management.

2-2. The meaning of collaborative governance

Looking at the transformation process of governance, it meant a social integration process at the national level in the 1970s and 1980s, and in the 1990s, democratic characteristics of it such as participation and consensus, including civil society, were emphasized. Since then, in the 2000s, the meaning of governance as a problem-solving process through active participation and mutual collaboration among various subjects has emerged and attracted attention (Kim et al., 2000; Kim & Lee & Choi, 2018). Although the definition of collaborative governance varies, it generally has the following common characteristics: 1) the forum, where the interaction takes place, is done to be through public institutions or systems, 2) those who participate in this forum include non-governmental actors. According to this, collaborative governance can be seen as a process in which the government, the private sector, and citizens are interested in and interact with specific social issues, 3) participants do not simply seek advice from public institutions, but directly intervene in decision-making in the forum where interactions occur. The core of collaborative governance can be seen as 'two-way communication' and multilateral interaction, 4) debates are officially organized and collectively characterized by gathering, 5) purpose of the debate is an agreement decision. Collaborative governance refers to the process of striving to agree as much as possible even if an agreement is not reached, 6) collaboration focuses on public policy or public management. In other words, activities such as conflict resolution or dispute settlement related to private interests cannot be included in collaborative governance in this sense (Ansell & Gash, 2008; Lee, 2010). In that sense, Ansell and Gash (2008) define collaborative governance as follows: “a governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision-making process that is formal, consensus-oriented, and deliberative and that aims to make or implement public policy or manage public programs or assets.” However, agreeing with the criticism that this lacks the concept of horizontal management that values mutual cooperation or network with non-governmental participants (Cho & Kim, 2009), I define collaborative governance is a governing arrangement where one

or more public agencies form horizontal relationships through cooperation, negotiation, network, and directly engage non-state stakeholders in a collective decision-making process that is formal, consensus-oriented, and deliberative and that aims to make, implement and manage public policy or public programs.

On the other hand, when approaching governance in terms of problem-solving, interest and research on alternative dispute resolution have increased to solve conflict problems surrounding many policy issues in our society, and collaborative governance is understood in the same context. Furthermore, Kim (2008) said that if viewed more actively, it is not important to resolve the conflict, but efforts to raise the level of common understanding and convert conflicting relations into collaborative relationships are required. If various stakeholders in society trust and collaborate with each other, the society will become healthier and more oriented-developed, and coexistence governance is an ideal form of governance in that it can expect win-win development, not zero-sum. But the key is that institutional foundation and stable settlement are required.

2-3. The meaning of Participatory Governance

Citizens' participation in the policy process is recognized as an important tool to improve the quality of public policies and services, increase execution power, improve transparency, and restore public trust in public institutions. The OECD (2016) also states that new and innovative forms of citizen participation are emerging worldwide, many of which already includes factors such as co-creation and co-production, and realizing citizen participation effectively across the entire policy cycle needs solid institutional, legal, and policy foundations.

As Lee (2010) refers to collaborative governance as “social coordination through voluntary cooperation of autonomous individuals,” civic participation and collaborative governance are highly related. In addition, Kim (2008) evaluates that the attribute of participation of stakeholders is an important concept in understanding the structure of collaborative governance, and especially citizen participation must be necessary.

Park (2002) presents effects of expanding citizen participation as follows: 1) it can complement the limitations of representative democracy, thereby enhancing policy accountability and responsiveness, 2) when citizen participation expands, policy issues and policy demands can be accurately judged, thereby enhancing policy democracy and rationality, 3) various opinions on policies presented through citizen participation can overcome the limitations of expert-oriented policy efficiency bias, 4) social equity can be improved by

reflecting the opinions of various groups or citizens, not specific groups, 5) it can promote trust in government activities and citizens' understanding.

Kim (2018) emphasizes the positive effects of participatory public conflict management measures in that they can contribute to conflict prevention, mutual understanding, and promotion of legitimacy and responsiveness to government policies by activating communication between the government and citizens. In addition, he emphasizes that inequality among participants must be resolved in order to have participant-based public conflict management measures based on collaborative governance effectively operated (Ansell & Gash, 2008; Lee 2010; Kim 2018).

This study also focuses on citizen participation, especially residents of areas where public problems have occurred. If citizens are private areas contrary to public power such as the government and are a broader concept that includes direct and indirect interests, residents in this study are limited to direct stakeholders residing in the upstream basin of Bohyeonsan Dam. This is because they are given direct roles in implementing comprehensive measures to improve the water environment while living in the upstream basin of Bohyeonsan Dam, and their participation is understood as a key element of comprehensive measures.

3. Review of Prior Studies on collaborative governance

3-1. Prior Studies on the factors of success in collaborative governance

Collaborative governance is one of the post-bureaucratic theories raised as an alternative to the criticism in the awareness of the problem of the government bureaucracy's unilateral and undemocratic problem-solving methods and lack of efforts to develop cooperative models in academic research. Compared with other models approaching governance as competition or conflict, the excellence of the collaborative governance model was emphasized by several scholars (Busenberg, 1999; Gray, 1989; Angel & Gash, 2008). In Korea, a number of studies are being conducted to apply the collaborative governance model to empirical cases as follows.

Bae and Kang (2018) proposed collaborative governance as a mechanism for resolving environmental conflicts, focusing on the Taehwa River case, suggesting the government's role, leadership, formal network construction, and formation of communication and trust of various stakeholders as success factors of collaborative governance. The success factors are subdivided into causal conditions (mayor’s leadership), master plan construction, strategy (network construction, effective conflict management), central phenomena (interaction between the

public and the private sector), interventional conditions (devotion, passion, and trust formation of stakeholders' projects), contextual conditions (formation of consensus on environmental improvement due to the role of the media) and results (improvement of projects).

Cho and Kim (2009) applied the models of Ansell and Gash (2008), focusing on the case of the big deal of environmental basic facilities in Gwangmyeong-si and Guro-gu, and reviewed resource imbalance, incentives for participation, and precedents of cooperation and conflict as starting conditions of collaborative governance. In the collaboration process, the order was analysed and revised in the order of understanding sharing, face-to-face conversation, trust building, and intermediate results. In addition, leadership was revised and applied from the initial conditions to establish a collaborative governance construction model suitable for South Korea.

Joo (2013) analysed the success factors of collaborative governance between local governments through cases where seven districts in Seoul and six cities in Gyeonggi-do form Anyangcheon Water Quality Improvement Countermeasures Council to improve Anyangcheon Stream water quality and create a hydrophilic environment. Collaborative governance between local governments is said to lead to a problem-solving mechanism in which stakeholders and community members related to problems in the community collaboratively solve problems through continuous interactions. For the successful operation of this governance, clear establishments of roles and responsibilities for each local government, of agreed operating rules and preliminary procedures, of cost-sharing principles, mutual trust relationships through accurate information provision and sharing, and of an operational transparency were analysed. In addition, the collaborative governance between local governments was very effective in improving the efficiency of regional projects and the satisfaction of local residents, so it was proposed to actively utilize collaborative governance.

Meanwhile, Kim (2015) explored the factors of success and failure in collaborative governance through 16 empirical cases of collaboration. Leadership, consultative councils, democratic processes, trust, interest-seeking, and power relations were derived as major variables, and the success factors of collaboration do not exist separately but rather works interrelated. He tried to derive South Korean-style collaborative governance success factors through domestic cases.

On the other hand, Kim (2008) analysed the factors of collaborative governance failure in the case of promoting the construction of the Buan radioactive waste disposal facility. The failure factor was that the government did not promote or provide incentives for stakeholders' participation, no formal governance was established for stakeholders to communicate, and trust

was not formed due to lack of leadership, antagonism, and intensification of conflict. In future policies, efforts to build collaborative governance through fostering collaborative leadership and strengthening education and training were emphasized.

Summarizing the existing studies, success factors through the collaborative governance model of Ansell and Gash (2008) can be applicable to specific cases in South Korea without difficulty. In addition, efforts have been made to establish a collaborative governance model in South Korea while supplementing this. In addition, when analysing regional and problematic situations, I agree that various factors affecting collaborative governance should be comprehensively considered (Joo, 2011). For the success of collaborative governance, the actual participation of stakeholders is activated, the local policy process is transparent, so everyone must have access to relevant information at a low cost, and accountability should be guaranteed for the actions of stakeholders (Joo, 2011).

3-2. Prior Studies on the governance of resident participation

Resident participation refers to the active participation of residents of the region as the main body in the process of discussing problems occurring in the local community together and seeking solutions. In the past, resident participation was not a participation but rather public relationships, and as a subject of public opinion polls or promotion of policies, residents were merely objects of research rather than active direct participation, and there was no two-way interaction (Park, 2001). However, it is now impossible to meet the mature participation needs of residents by unilateral information delivery or simple opinion collection, and the expansion of the scope of residents' participation and advancement of participation are needs of the times.

As shown in Figure 1 below, the International Association for Public Participation (IAP2) presented the concept and scope of the stage of resident participation separately, like the following: 1) Inform (website/newsletter, data provision/disclosure, training) 2) Consult (survey, public meeting, listening to opinions, focus groups, etc.) 3) Involve (discussion and vote, workshop) 4) Collaborate (agreement formation, resident advisory committee, participatory decision-making) 5) Empower (resident vote, resident jury, delegation of authority, etc.). The intensity of residents' participation increases in the order of above.

In this study, the stage of resident participation in collaborative governance means the stage of collaboration. This is because beyond the level of simple information delivery, listening to opinions, or discussion, residents directly form an agreement on ways to improve the water environment through the committee and make participatory decisions. Prior studies on resident

participation governance in the collaboration stage has also been actively conducted as follows.

Increasing Impact On The Decision

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICI-PATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

<Figure 1. IAP2 Spectrum of Public Participation>

Shin (2014) analysed the success factors based on the Ansell and Gash (2008) model through a series of processes shown in the case of the citizen participatory budgeting ordinance revision of the Incheon city. It was about in terms of the Starting Conditions of collaboration (Power-Resource-Knowledge Asymmetries, Incentives for and Constraints on Participation, Prehistory of Cooperation or Conflict), and the Collaboration Process (Face-to-Face Dialogue, Trust Building, Commitment to Process, and Shared Understanding). For the success of collaborative governance, stakeholders must be interested in and have basic capabilities, and sincere dialogue between them is needed. It can be seen that this emphasized fostering competency for practical participation of stakeholders for collaboration.

Bae and Kang (2018) analysed critical factors of successful collaborative governance for resolving environmental problems focusing upon the Taehwa River. Ulsan citizens' participation in the Taehwa River project was put in the category of public-private interaction was put as a central phenomenon for in that they blocked the inflow of daily sewage due to voluntary participation of citizens, civic groups, and local companies. In addition, the formation of a consensus on the restoration of the Taehwa River was analysed as a contextual condition along with the role of the media.

Yoo and Hong (2005) analysed the water quality improvement policy process created by voluntary collaboration efforts of local residents and collaboration between residents and the

government through the case of water quality improvement in Daepocheon, Gimhae-si. When Daepocheon Stream in Gimhae-si was degraded to the level 4-5 in water quality and the issue of designating a water source reserve was raised, residents voluntarily formed a Sangdong-myeon Water Quality Improvement Countermeasure Committee and tried to solve the problem by preparing self-governing regulations. It is said that this led to active support from the government, and this interaction between the government and residents strengthened mutual collaboration.

Bae and Lee (2015), and Lee (2017) studied the possibility of resident-participating basin management in the river basin monitoring activities in the Musimcheon. As a result of regularly monitoring residents for each river section, it was possible to identify the actual basin and status of blind spots in the management of pollutants.

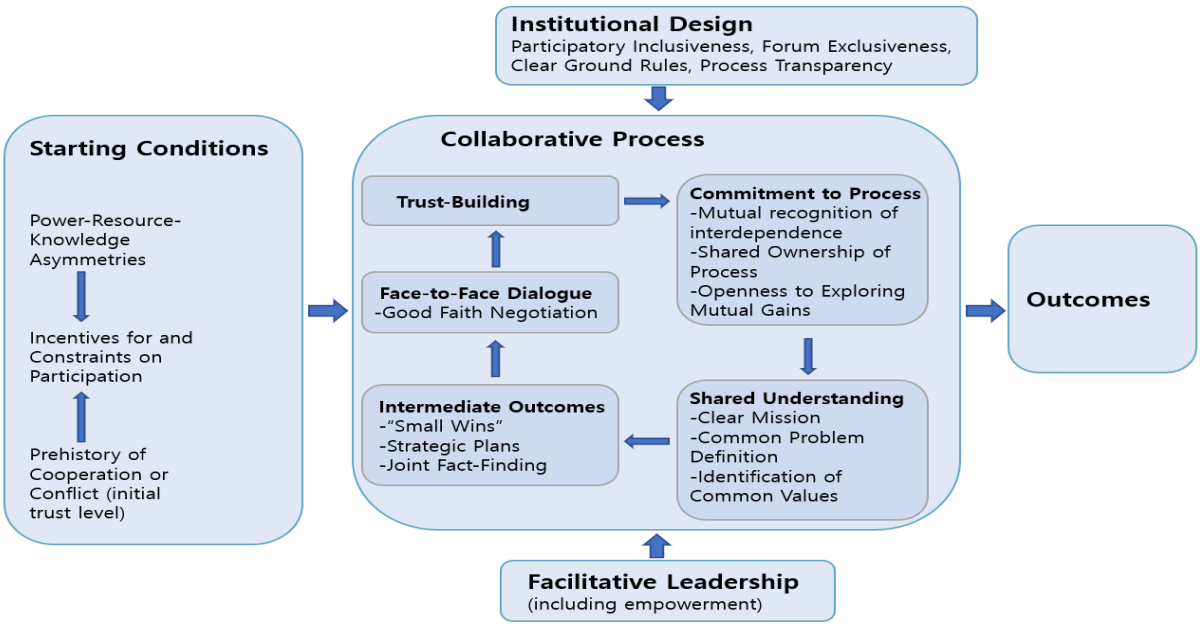
3-3. Differentiation from prior studies

There are many other studies on residents' participation as supplementary measures to complete the local governance autonomy system, such as the local government's ordinance enactment and revision process, resident participation audit system, and resident participation budget system. In the case of resident-participating in the Musimcheon river basin, certain residents were given the limited role in monitoring at fixed cycles and it differs from Bohyeonsan Dam resident participation governance in which all residents of the upstream basin played (Bae & Lee, 2015). In addition, the Anyangcheon Water Quality Improvement Countermeasures Council mentions partly the participation of residents, but it rather focuses more on collaboration between contiguous local governments as stakeholders (Joo, 2013). In the case of water quality in Daepocheon, Gimhae-si, the facilitative leadership of the government and institutions does not seem to have played its role properly in that residents took the initiative in the beginning and led the participation of the government and local governments.

This study is an empirical analysis about resident-participating collaboration governance of Bohyeonsan Dam. Collaborative governance in Bohyeonsan Dam has succeeded in that the mutual trust-based collaborative governance has been completed in water environment management. Also, it emphasizes the role of residents as key players in implementing measures to improve water environment in the Bohyeonsan Dam basin.

3-4. Ansell & Gash model introduction

Ansell & Gash (2008) reviewed 137 cases of collaborative governance across various policy sectors to identify important variables that affects successful collaboration. Important variables include the Starting Conditions of collaboration (Power-Resource-Knowledge Asymmetries, Incentives for and Constraints on Participation, Prehistory of Cooperation or Conflict), and the Collaborative Process (Face-to-Face Dialogue, Trust-Building, Commitment to Process, Shared Understanding, and Intermediate Outcomes as 'small victories'), and Facilitative Leadership, and Institutional Design and Outcomes. (Ansell & Gash, 2008). As shown below Figure 2, Ansell and Gash created a diagram explaining the successful collaboration process through trust building. It is meaningful that Ansell and Gash have derived the success factors of collaborative governance from several cases, which is a useful analysis tool for collaborative governance. Since then, scholars have developed collaborative governance by analysing and applying this model to individual cases, and Ansell and Gash have laid the stable foundation.



<Figure 2. A Model of Collaborative Governance (Ansell & Gash, 2008)>

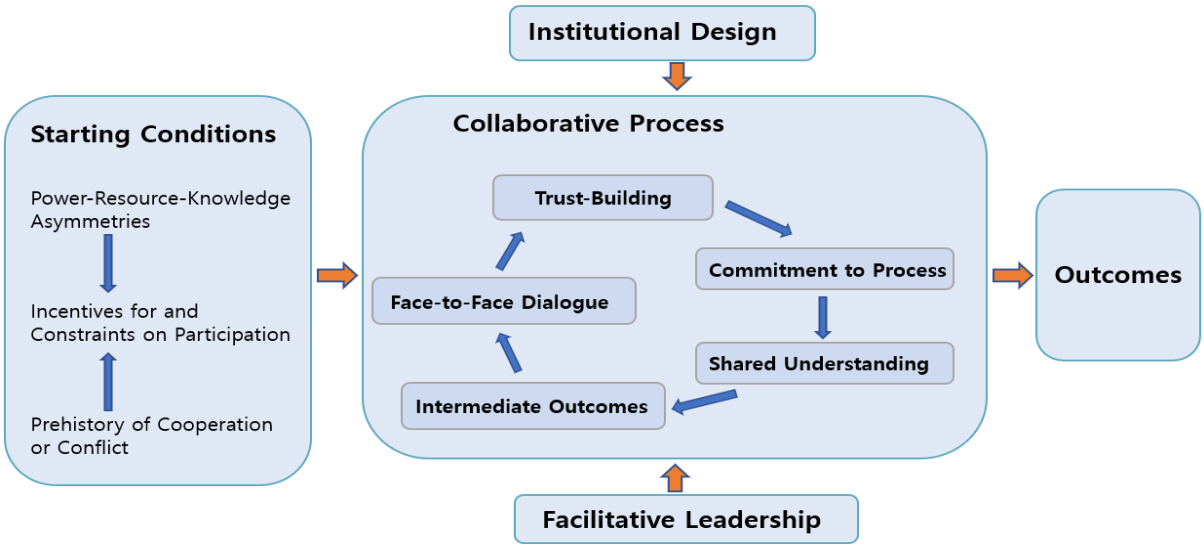
4. Study method and study design

4-1. Study method

In this study, the Ansell & Gash model (2008) will be applied to the case of Bohyeonsan Dam resident participation governance to dynamically analyse various aspects, timing, and step-by-step construction process related to the construction of collaborative governance (Cho

& Kim, 2009). In many prior studies, case analysis is conducted by applying the Ansell & Gash model as a representative example and the theoretical validity of this model has been verified (Bae & Kang, 2018; Cho & Kim, 2009). Also, there are no significant differences between the success factors presented in prior studies in that just partly complement or revise the success factors of this model (Seo and Min, 2005; Chae & Kim, 2009; Kim, 2011; Choi & Kim & Jung, 2015; Cho & Kim, 2009; Bae, 2010; Oh & Ko, 2012; Nam & Lim, 2014).

The collaborative governance theory of Ansell & Gash (2008) emphasizes the importance of collaborative process such as trust-building through face-to-face dialogue, achievement of intermediate outcomes as the parties commit themselves to the process, and institutional design and facilitative leadership. Therefore, in this study, in order to analyse the success factors of collaborative governance in the case of Bohyeonsan Dam resident participation governance for improving water environment, each element derived from the Ansell & Gash model will be deductively extracted in the following analysis framework and analysed.



<Figure 3. Analysis frame for application to this study>

4-2. Research Objects

Governance presupposes collaboration of a number of stakeholders. According to Chrislip and Larson (1994), in a collaborative context, stakeholders refer to those responsible for problems or issues, who have the knowledge or time necessary for good solution and strategy development, and who have the power or resources to interfere with solution and strategy execution (Bae 2010). As for the scope of stakeholders, there will be detailed differences by case depending on the purpose of governance and the issues of major discussions. But in general, it includes various classes directly or indirectly related to social issues such as

government, local government, institution, resident, NGO, academic experts, etc.

Regarding the Bohyeonsan Dam Water Environment Management Comprehensive Measures, two governances have been established and operated. One is the "Bohyeonsan Dam Water Environment Management Council," (launched in November 2018) which was established by the Nakdonggang River basin headquarters, the upper organization of the Bohyeonsan Dam office, and it is consist of government (Ministry of Environment), K-water, Yeongcheon-si, resident representatives, an NGO, academic experts and it hold semi-annual meetings. The other is the "Bohyeonho Win-Win Development Council," which is expanded and reorganized from the Bohyeonsan Dam Water Quality Countermeasure Committee, operated previously by the Bohyeonsan Dam office. Bohyeonho Win-Win Development Council consists of K-water, Yeongcheon-si, upstream and downstream resident representatives, academic experts, and an NGO. The Bohyeonho Win-Win Development Council has two subcommittees under its issues under its wing: the "Upstream of the Dam Subcommittee" (starting in September 2019) and the "Culture and Tourism Subcommittee" (starting in May 2020). The Bohyeonsan Dam Water Environment Management Council deals with comprehensive discussions and major agendas (organized by the Nakdonggang River basin headquarters), and the Bohyeonho Win-Win Development Council deals with the detailed implementation of the project (organized by the Bohyeonsan Dam office).

This study focuses on the Bohyeonho Win-Win Development Council, established by Bohyeonsan Dam office, especially the Upstream of the Dam Subcommittee to apply the collaborative governance model and analyse its success factors. In addition, I would like to propose a plan to expand and apply the success factors derived in this way to all governance of K-water sites. Because the Bohyeonsan Dam Comprehensive Measures include a number of roles that the residents of the upstream basin of the dam must play in their daily lives, so the residents of the upstream basin of the dam can be said to be the actual actors of the measures. As governance to solve the problem of the water environment through close collaboration between residents and K-water, I would like to emphasize collaborative success factors such as mutual trust building and resident participation.

4-3. The subject period of the study

The subject period of this study is the Bohyeonsan Dam Water Environment Management Comprehensive Measures Implementation Period, from 2019 to 2021.

4-4. Study materials

This study is based on documents on the establishment and progress report of the K-water's Bohyeonsan Dam Comprehensive Measures (the Bohyeonsan Dam Water Environment Management Comprehensive Measures Implementation Plan of K-water (2019), et.), the Bohyeonho Win-Win Development Council (2019-2020), and the K-water Bohyeonsan Dam Environment White Paper (2019-2020, which contains Resident Interview, et.), articles, and broadcasting contents.

5. Case Analysis: the Bohyeonsan Dam collaborative governance

5-1. Background and Characteristics of Bohyeonsan Dam governance

5-1-1. Background

Until couple years ago, water management in Korea has been divided into water quantity management by the Ministry of Land, Infrastructure and Transport, and water quality management by the Ministry of Environment. As a result, problems had been raised about conflicts and overlapping projects in related fields, work inefficiency and budget waste, and needs for systematization of water management systems. Unifying water management was President Moon Jae-In's presidential pledge, but after a lot of controversies, the Framework Act on Water Management was enacted in June 2018. The conditions for integrated water management have been created by unifying water-related organizations centred on the Ministry of Environment. The Framework Act on Water Management was enacted in June 2018 with the aim of contributing to the improvement of the quality of life of the people by establishing a sustainable water circulation system. For the next year, it took effect on June 13, 2019 after enacting subordinate laws such as enforcement ordinances and enforcement rules (Lee & Han, 2019). As a result, the Ministry of Environment was able to manage water in an integrated way, from water quantity, water quality, and disaster prevention, and the organization in charge of water resources of the Ministry of Land, Infrastructure and Transport was transferred to the Ministry of Environment. K-water, a public corporation specialized in water management under the Ministry of Land, Infrastructure and Transport, has been changed to a public corporation under the Ministry of Environment (First Step in Integrated Water Management, 2019).

Therefore, K-water needed to promote pilot projects and spread performance in accordance with the purpose of unifying water management. By promoting basin management measures through stakeholder participation, it was intended to achieve results that the people could feel early. Meanwhile, Bohyeonsan Dam continued to raise issues about the feasibility of dam construction due to persistent occurrence of green algae since its first fill with water in 2015. Since its completion, the water storage rate has been only 10-20%, so it was necessary to come up with a fundamental solution to the crisis under the criticism such as "White elephant of 330 billion (Yeongnam Ilbo, 2016) and "Green Algae Dam" (Daegu MBC, 2018).

Bohyeonsan Dam is the smallest multi-purpose dam, and compared to other dams, the upstream basin of the dam is smaller, so various attempts related to water quality improvement are possible. Therefore, it was the most suitable dam for K-water as a test bed that could start a new business field called water quality and water ecosystem vigorously where fast results can be expected. In addition, in the upstream basin of the Bohyeonsan Dam, orchards are concentrated adjacent to rivers, and the loss of surface compost is repeated during rainfall, and the population and livestock density are high, and there are no sewage treatment facilities. Expectations and enthusiasm for creating successful cases of win-win development with the resident and achieving the results of water quality improvement through collaboration with upstream basin residents also played a part.

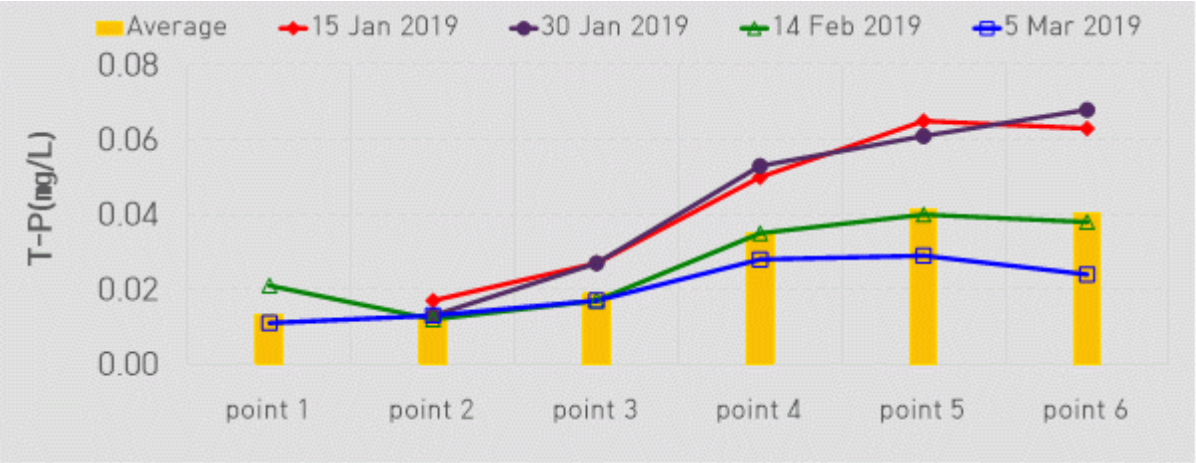
5-1-2. Overview of Bohyeonsan Dam and Characteristics of River Basin

Figure 4. the spot of Bohyeonsan Dam river basin

Figure 5. detail spot of Bohyeonsan Dam river basin

Bohyeonsan Dam was built to provide stable water supply in the Geumhogang River basin and reduce flood damage downstream of the river. The construction of the Bohyeonsan Dam proceeded from 2010 to 2016 (construction completion in 2014 and first filling water in May 2015). Bohyeonsan Dam can supply 14.9 million tons of water annually, control 3.5 million

tons of flooding annually, and generate 1.4GWh of hydroelectric power annually. The total reservoir of Bohyeonsan Dam is 22 million tons, its height is 58.5m and its length is 250m. Bohyeonsan Dam is the first arch-shaped concrete gravity dam and is the smallest among multi-purpose dams in South Korea. The river basin of Bohyeonsan Dam is 32.6㎢ large, with a steep slope and fast runoff speed, and residences, livestock houses, and farmland are concentrated in major inflow rivers. There are three main pollutant characteristics. First, there was no public sewage treatment facility upstream basin of the dam, so domestic sewage flowed into the dam and stream without any filtration. Second, numerous apple orchards are adjacent to dams and rivers. The compost in the orchards has excessively been sprinkled on the soil due to the aging of farmers and the lack of workers. When it rains, the compost sprayed excessively was repeatedly leaked into the river. Third, in comparison with major dams in the Nakdonggang River water system, the upstream basin of the Dam population, livestock, and farmland density are high, which is characterized by a high proportion of pollutants (The Result of Precision Pollution Source Survey in Bohyeonsan Dam basin, 2018). Figure 6 below is part of the water quality monitoring results of Gohyeoncheon Stream, the main stream of Bohyeonsan Dam, and it can be seen that the N(Nitrogen)-P(Phosphorus) concentration increases due to the inflow of sewage and compost in the village as it goes downstream, and the N-P concentration increases as it enters the farming season.



* As the measurement point 1 → 7 goes, it gets closer to the dam reservoir from the end of the upstream river basin of the dam.

< Figure 6. Results of water quality monitoring in Gohyeoncheon Stream, 2019 >

5-1-3. The main contents of the Bohyeonsan Dam Comprehensive Measures

By reflecting the results of a detailed survey of pollutants in the Bohyeonsan Dam basin, customized measures for each pollutant source were established to prevent the inflow of

pollutants into the river. First of all, soil pollutant caused by compost spills account for the largest proportion. In order to reduce compost outflow, the deep placement fertilization which means the fertilizer injection in which makes in deep holes near roots, as an eco-friendly farming corporation is applied, and soil consulting and training by experts are conducted. Next, measures for household pollutant, contain the establishment of public sewage treatment facilities, cleaning their individual septic tanks before the rainy season, sort out recycling waste and food waste, no littering into the ditch and rivers. Measures for livestock pollutant contain the supply of rain screens for the compost, which is to prevent the compost piled on the road from inflowing into river, and the construction of common compost storage. Additionally, there are more measures such as the reinforcement of water quality monitoring, making the ship for removal of green algae, in order to create a healthy water ecosystem, the contents include the remodelling of the village's old reservoirs, restoration of ditch, improvement of existing wetlands, and creation of new wetlands, etc. Hereinafter, measures related to resident participation will be examined in detail.

The deep placement fertilization is an eco-friendly farming method that makes five to six holes near the roots of fruit trees and injects a small amount of compost into the holes. Compost is put near the roots of fruit trees, so nutrients are well delivered, and the amount of compost is reduced. Compared to the surface layer application of fertilization, which sprays a large amount of compost on the ground surface, it has the effect of reducing pollutants flowing into rivers by reducing compost flowing out during rainfall. As a result of the Ministry of Environment's pilot project (2016-2018), the deep placement fertilization reduced more than 50% of the amount of compost use and decreased the TOC concentration by 19%, the T-N concentration by 28%, and the T-P concentration by 61%. In the pilot orchard, where the deep placement fertilization half and the surface layer application of fertilization are applied half and half, the T-P concentration through the deep placement fertilization was reduced by 26-54.6% and the T-N concentration by 21.6-4.3% compared to the surface layer application of fertilization in the other half. The deep placement fertilization has a positive effect on water quality, and there is no significant difference in the harvest of crops, and rather, it is said that long-term application can improve the harvest of crops.

In order to prevent excessive compost use, soil was analysed and provided for each farm to quarrel with the appropriate composition and appropriate amount of compost according to the soil characteristics. Through this, residents' understanding was improved and an appropriate amount of compost was used. In addition, university professors who specialized in fruit farming were invited to provide education and on-site consulting for farmers.

Consultations between the Daegu Environmental Administration and Yeongcheon-si has been supported by K-water so that the plan to install public sewage facilities, local government is in charge of which, could proceed as soon as possible. On the other hand, cleaning of septic tanks for each household upstream basin of the dam has been completed to prevent the septic tanks from overflowing and flowing into the dam and rivers during intensive rainfall every year until the installation of public sewage facilities (more than once or twice a year since 2019).

In addition, to prevent the garbage from flowing into the river, the trash sites for sorting out have been installed in the village of the upstream basin of the dam.[1]

After K-water has tried to persuade the residents to participate, and conducted several consultations with Yeongcheon-si, the sorting out food waste system started since June 2019. It was the first time in a small rural town, food waste separation and collection were conducted on a trial basis. Since then, the number of villages has increased to participate in the sorting out food waste system.[2]

Leaflets of pledges of practice in daily life containing images were produced with and distributed to make it easier for residents to understand what algae is, what residents will practice in their daily lives in order to reduce green algae. In addition, through environmental education for residents, the inflow of pollutants into rivers was minimized, such as using an appropriate amount of compost and not dumping garbage into rivers. Residents have been appointed as dam clean guards to patrol rivers, regularly carried out river purification activities in connection with the elderly job project. In addition, rain screens for the compost have been produced and distributed to farmers so that the compost piled on the road do not inflow into river when it rains.[3]

In addition, K-water has expanded the water quality survey points and shortened the survey cycle to strengthen monitoring.[4] The ditch contaminated by garbage or sediment has been maintained to facilitate the flow of water to purify the river, and aquatic plants have been

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[1] 4 sites completed in 2018, 2 sites in 2019, 1 site in 2020

[2] Total 3 spots in 2019 → total 4 spots in 2020

[3] However, the construction of a joint compost storage in the village, which was originally included in the comprehensive water environment management comprehensive measures, was cancelled due to controversy over the management of a joint compost storage in the middle of the consultation with residents (June 2019).

[4] 5 spots → 20 spots, monthly → every other week / every day in the rainy season

planted and aesthetic elements have been added[5]. In order to enhance the effect of improving water quality, strengthen the role of wetland as an ecological wetland by improving the function of existing artificial wetlands, and constructing new wetlands as well. Furthermore, in order to secure environmental water, a plan to utilize the old reservoirs in upstream basin of the dam has been added at the end of 2019. This is to restore the health of the aquatic ecosystem by dredging the old reservoirs where the amount of fresh water has decreased due to deposition to secure additional water quantity so that can make water flow in the river 365 days a year.

5-1-4. Characteristics of Bohyeonsan Dam governance

The comprehensive measures for water environment management of Bohyeonsan Dam reflect the characteristics of no public sewage treatment facility upstream of the dam. As various measures to minimize the inflow of sewage from living and agriculture into the river, a number of measures requiring active participation from residents in the upstream of the dam, such as the application of the deep placement fertilization, appropriate compost use, and separate discharge of food waste, were included. To this end, we focused more on communication and collaboration with residents, and the difference from the existing governance previously constructed (until 2018) is shown in Figure 7 below.

The most important thing in the comprehensive measures for water environment management of Bohyeonsan Dam was to change residents' perceptions and establish residents' lifestyles and habits to reduce pollutant emissions. Through collaborative governance, where K-water and residents practically communicated with each other, mutual trust has been established, and the goal has been reached with the active participation of residents. Changing the fruit farming method that has been maintained for decades was not an easy decision for farmers. Nevertheless, the residents have been willing to apply deep placement fertilization, an eco-friendly farming method, to their orchards with a desire to keep the rivers in their village clean, and gradually expanded it[6]. In addition, food waste and fallen fruits have been thrown away in the river in front of the house without any inconvenience, but for the first time in small villages, they endured the hassle of separating and throwing away food waste. Yeongcheon-si has also provided food waste collecting vehicles to an outer village 30 minutes away by car

[5] The restoration for village's ditch was completed 2 spots in 2019, 1 spot in 2020, 1 spot in 2021.

[6] 79,000㎡ in 2019, 89,000㎡ in 2020, 142,000 in 2021

from downtown. Residents regularly have carried out river purification activities, and voluntary monitoring continued as they have volunteered to keep the river clean. It was not an insignificant routine to throw away food waste and fallen fruits in nearby rivers in the past, but residents gladly have participated to protect the rivers in their hometown with their own hands.

Differences between Bohyeonsan Dam Governance			Performance
	Existing(before)	Improvement(after)	
Title	Bohyeonsan Dam Water Quality Countermeasure Committee	Bohyeonho Win-Win Development Council	Emphasis on the meaning of comprehensive and collaborative
Purpose	Discussion on water quality measures	Comprehensive discussion on regional development plans	Discussion on win-win development
Participation	Representative of upstream residents, Local governments officers in charge of rivers and agriculture	Representatives of upstream and downstream, Local governments officers in charge of rivers and agriculture and culture, NGO, Academic Experts	Strengthen communication among residents in the upstream and downstream Synergy effect linked to local issues Expanding the participation of residents
Topic	Water quality	Water quality, Ecology, Tourism, Education, Culture as a whole	Discussion on win-win development Sustainable development
Subcommittee	None	Newly established according to the theme. - Upstream of the dam / - Culture and Tourism	Focus on key stakeholders Strengthen communication Building trust
Operation	Focusing on Sharing issues about K-water	Two-way sharing/cooperation about K-water, residents, local government	Trying to resolve the issue together Need/Information sharing. Information disclosure/trust building
Cycle	Twice a year	Council - Twice a year Subcommittee - (upstream) every month / - (culture) every other month	Increase the frequency of contact Regularization Strengthen communication
Written form	None	Written form in every meeting	Mutual respect Horizontal relationship Information disclosure Transparency
Efforts to resolve issues	None or Passive	Active (ex. Apple Vinegar: 30 tons of fallen fruits / Support for village broadcasting equipment)	Building trust Increasing resident income Trying to resolve the issue of village

< Figure 7. The comparison analysis of the Bohyeonsan Dam governance >

The implementation of the comprehensive measures for water environment management of Bohyeonsan Dam would have been impossible without the active participation and practice of residents. Through the collaborative governance called Bohyeonho Win-Win Development Council and Subcommittee, K-water could communicate with residents and build trust, and inspire the pride of the residents and led to a virtuous cycle in which residents participate more actively. In addition, the comprehensive measures of Bohyeonsan Dam were to maintain a clean water environment by settling down the lifestyles and habits of upstream residents and to pursue the water of life enjoyed by humans and nature together in the mid-to-long term.

Clean villages and river basins can make the better places for residents to live and for tourists to entertain. Furthermore, it can lead to revitalizing the local economy. In particular, Yeongcheon-si has been implementing the Bohyeonsan Dam Tourism Belt Project that connects Bohyeonsan Dam with Zipline, Footbridge (under construction), and Bohyeonsan Observatory since 2019. Clean river basins and new tourist attractions can lead to promote apples as regional specialties of Yeongcheon-si and increase residents' income. The effect of win-win development with residents and region can be expected from the success of improvement of the water environment through Bohyeonsan Dam governance.

According to the monitoring results of Bohyeonsan Dam water quality in 2019, even if there is a limitation that it might be affected by change depending on temperature and rainfall conditions, it was confirmed that the T-N and T-P were reduced after implementing the comprehensive measures for water environment management of Bohyeonsan Dam. It was a 64% reduction in T-N and a 75% reduction in T-P compared to the previous year's rainfall season. Also, the number of green algae occurrence days were decreased by 30% and the average number of harmful blue-green algae were decreased by 38% compared to the previous year.

5-2. Analysis on the Success Factors of Bohyeonsan Dam collaborative governance

5-2-1. The starting conditions for collaboration

(1) Power-Resource-Knowledge Asymmetries

Ansell & Gash (2008) states that if some stakeholders do not have the capacity, organization, status, or resources to participate or are unable to participate on an equal basis with other

stakeholders, the collaborative governance process is likely to be manipulated by stronger actors; effective collaborative governance is said to require a commitment to positive strategies for empowerment and representation of weak or unfavourable stakeholders. The asymmetry of power, resources, and knowledge is inevitable between institutions in charge of improving the water environment and residents. However, Bohyeonsan Dam governance attempted to alleviate its asymmetry by sharing information or current status, recording it in writing, and discussing about measures through regular meetings every month. It seems that the alleviation of asymmetry has reached a level that can be overcome through the acceptance and participation of residents.

(2) Incentives for and Constraints on Participation (attraction mechanism for participation)

The incentives for stakeholders to launch collaboration have emerged as a factor explaining whether collaborative governance can succeed. If stakeholders perceive that achieving their goals depends on the collaborative of other stakeholders, incentives to participate in collaborative governance will also increase (Logsdon, 1991; Angell & Gash, 2008). However, if stakeholders realize their opinions were taken just as mere advice, they will reject collaboration (Futrell, 2003; Angel & Gash, 2008). Bohyeonsan Dam governance continued to confirm mutual dependence through the monthly the Upstream of the Dam Subcommittee.

Participation incentives in the governance of Bohyeonsan Dam promotion of the water environment can be said to be a successful link to Projects for Supporting Dam Environs. The monthly Upstream of the Dam Subcommittee has presented pending issues in each of the six villages, considered solutions together, and fully supported the resolution of pending issues as part of the Projects for Supporting Dam Environs to improve the water environment of the upstream basin of the Dam. In the case of dams larger than a certain size, the area around the dam can receive economic support in order to increase the income and welfare of residents around the dam for a certain range of areas according to Article 43 of the “Act on construction of dams and assistance, etc. to their environs.” Supporting projects for area around dams have become strong incentives and incentive mechanism for residents' participation in the Bohyeonsan Dam governance to improve the water environment. For example, when the village chief announced major announcements of the village with broadcasting equipment installed in the village hall, it has been delivered through loudspeakers installed on the village road telephone poles, but there were many difficulties due to double windows installed in each house. Through support for the replacement of village broadcasting equipment, receivers have been installed in each house to be used not only for village announcements, but also for

encouraging river purification activities or warning broadcasts against garbage dumping. Also, in 2019, around 30 tons of bruised apples were generated due to typhoons during the harvest season, K-water had looked for the food processing companies to purchase bruised apples which residents had difficulty to deal with, for the residents. Incentives for residents' participation efforts were actively given, such as making these apples into an apple vinegar for promoting local specialties and using it as a souvenir.

(3) Prehistory of Cooperation or Conflict (initial trust level)

Under the starting conditions of collaborative governance, there is a possibility that conflicts between stakeholders will hinder collaboration. However, Ansell & Gash (2008) said that conflict itself does not necessarily become a barrier to collaboration, and in existing successful collaborative cases, stakeholders themselves realized that they could not achieve their goals without participating in the collaborative process with other stakeholders with opposite interests. Nam and Lim (2014) empirically verified that even if hostility and distrust among stakeholders are strong in the case of Songsan Green City, policy deadlocks due to high interdependence and intensifying conflict to achieve their goals can provide strong driving force for the establishment of collaborative governance.

In the governance of residents' participation in Bohyeonsan Dam, there was inevitably a precedent relationship of conflict. As in all other dam construction, even at the time of the construction of Bohyeonsan Dam, residents strongly opposed the construction of the dam due to infringement of property rights. The Beophwa-ri chief, the representative of the six upstream villages' chiefs in the Bohyeonsan Dam governance, was the chairman of the Public Relations Committee of the "Bohyeonsan Dam Construction Opposition Committee" at the time of the construction of Bohyeonsan Dam. According to the anecdote of the Beophwa-ri chief, he distributed the whistle to people at the rally against the construction of Bohyeonsan Dam. People firmly expressed their opposition to the construction by simultaneously blowing the whistle, and the police were embarrassed at the time. Including the Beophwa-ri chief, who was such an extreme opposition, residents who were oppose or indifferent to Bohyeonsan Dam have been changed and gathered their minds to actively participate in the practice of improving the water quality of village rivers. This is believed to have caused high interdependence and synergy effects through the pride that residents could directly contribute to improving the water quality of their own village rivers, technical measures of K-water to improve the water quality, and village improvement support to promote residents' participation.

5-2-2. Facilitative Leadership (including empowerment)

Leadership is widely recognized as an important factor in eliciting stakeholders from tough factors throughout the collaborative process (Chrislip & Larson, 1994; William et al., 2002). Leadership is important for establishing and maintaining clear basic rules, building trust, promoting dialogue, and exploring mutual interests, and ensuring the integrity of the consensus-building process itself (Ansell & Gash, 2008).

Ryan (2001) states that "effective" collaborative leadership is to properly manage collaborative processes, maintain technical reliability, and empower to be able to make reliable and convincing decisions that everyone can accept. In addition, collaborative leaders should have skills to (1) promote broad and active participation, (2) ensure wide influence and control, (3) promote productive group dynamics, and (4) expand the scope of the process. In addition, Lasker and Weiss (2003) argue that facilitating leaders should encourage participants express their opinions and listen to each other, and stimulate creativity to help the group create new ideas and understanding by combining the knowledge of various participants. This means on the other hand, that the possibility of effective collaboration may be limited due to a lack of leadership.

In accordance with the government's water management unification policy, K-water tried to confirm its capacity of management by using Bohyeonsan Dam as a testbed in expanding its business area to water quality and water ecosystem management as well as water quantity. Bohyeonsan Dam is the smallest dam among multi-purpose dams, and since the completion of the dam, the issue of green algae has been highlighted, so various measures have been attempted to measure its improvement. Therefore, a facilitating leader was highly needed to these changes and promote comprehensive measures. As the dam construction was completed, the office name was changed from "Bohyeonsan Dam Construction office" to "Bohyeonsan Dam Management office" (December 2014), and a level of the head of the office also got downgraded a “second level-Eul” from a “second level-Gap”. Following the completion of the construction, the head of the “second level-Gap” was assigned from 2015 to 2016, but after that, the head of the “second level-Eul” was assigned and the office had been operated as a dam management-oriented workplace. However, considering the importance of the comprehensive water environment management measures promoted from 2019, K-water again assigned the head of “second level-Gap” to successfully initiate the comprehensive measures. Meanwhile, although the head of the technical field for dam construction or operation had been previously assigned, for the first time, the new appointment of the head in the administrative field was to

make residents participate and collaborate.

In addition, the new head of the Bohyeonsan Dam was a leader who went through the Planning and Coordination Department and the Public Relations Department, combining integrated thinking, macroscopic perspective, drive, creative ideas and affinity. He most emphasized active communication with residents and building trust, instructing the expansion and improvement of existing governance and the establishment of the Subcommittee of the upstream of Dam, communicating with residents without hesitation, and motivating employees. As with the requirements suggested by Ryan (2001), the new head was a leader with skills to promote active participation of residents, ensure a wide range of influence such as incentives for participation, promote productive dynamics within the department, and expand the scope of the process. In addition, as suggested by Lasker and Weiss (2003), he had encouraged residents to speak out their opinions, listen to each other. He not only gained trust from residents by first considering what was for them, but also played a successful role as a facilitative leader to increase the creativity and work commitment of employees in the office.

5-2-3. Institutional Design (Participatory Inclusiveness, Forum Exclusiveness, Clear Ground Rules, Process Transparency)

Institutional design refers to basic protocols and rules for collaboration, which are important for the procedural legitimacy of the collaborative process (Ansell & Gash, 2008). As Chrislip and Larson (1994) noted, the first condition of a successful collaboration is that it should broadly include all stakeholders affected or interested in the issue, potentially "problematic" stakeholders. Gray (1989) also stressed that successful collaboration depends on including a wide enough range of stakeholders to reflect the problem. The Bohyeonho Win-Win Development Council, as the upper-level council of the Subcommittee of the upstream of Dam, was expanded and reorganized in May 2019 reflecting to the Bohyeonsan Dam Water Environment Management Comprehensive Measures. The members of this council could justify the activities and roles of the "Subcommittee of the upstream of Dam" by broadly being included not only representatives of residents in the upstream of the dam, but also representatives of residents in the downstream of the dam, and agricultural, tourism, water quality-related departments officials of local government, and academic experts, and NGO. In particular, in this Council, the residents of the downstream of the dam thanked to the residents of the upstream of the dam for their participation and efforts in improving the water quality, agreeing with giving full support to the upper stream area. Because the water quality

of the downstream is directly connected with the water quality of the upstream basin.

		Organization	Position	Note
The Members of the Council (18)	Yeongcheon-si (Local government) (5)	Department of Environmental Protection	section Chief	
		Environment Center	section Chief	
		Department of Technical Support at Agricultural Technology Center	section Chief	
		Department of Tourism Promotion	section Chief	
		Hwabuk-myeon office	Chief of myeon	
	Residents (8)	Ipseok-ri	village Chief	**Subcommittee of the upstream of Dam**
		Beophwa-ri	village Chief	
		Hasong-ri	village Chief	
		Sangsong-ri	village Chief	
		Jukjeon 1-ri	village Chief	
		Jukjeon 2-ri	village Chief	
		Hwabuk-myeon Prosperity association	Chief	resident of downstream
		Hwabuk-myeon Women's Association	Chief	resident of downstream
	K-water (3)	Bohyeonsan Dam Office	Head	
		Bohyeonsan Dam Office	Manager of Operations of Dam	**Subcommittee of the upstream of Dam** * The entire Managers of Dam office included
			Manager of Environment	
	Academic Expert (1)	Andong University	Professor	
	NGO (1)	Yeongcheon-si YMCA	Chief director	

* administrative secretary: Manager of Administration of K-water Bohyeonsan Dam Office
** The Subcommittee of the upstream of Dam includes the entire Managers of the Bohyeonsan Dam Office to diversify opinions and strengthen contact with residents

< Figure 8. The Bohyeonho Win-Win Development Council and the Subcommittee of the upstream of Dam >

Tett, Crowther and O'Hara (2003) suggest that inclusiveness is closely related to the exclusivity of the collaborative forum, making it easier to motivate stakeholders to participate when the collaborative forum is "the only game in the village." Since the governance related to Bohyeonsan Dam is the only one, there is no difficulty in recognizing the exclusivity that can

motivate the residents of the upstream of the dam.

Murdock, Wiesner, and Sexton (2005) suggest that clear basic rules and process transparency are important design features, and that clear and consistently applied basic rules convince stakeholders that the process is fair and open. This is because the transparency of the process means that stakeholders can be sure that open negotiations are “real” and that the collaborative process is not concealing private transactions in the secret room. As the implementation of the Bohyeonsan Dam improvement of the water environment, the Subcommittee of the upstream of Dam laid the groundwork for the formation of subcommittees when the Bohyeonho Win-Win Development Council expanded or reorganized in May 2019, and the Subcommittee of the upstream of Dam was held every month. In addition, official minutes were prepared in writing at each meeting to record in detail the contents of discussions and implementation plans at the last meeting, and each meeting was provided in writing to the heads of the village to secure clear basic rules and transparency.

5-2-4. Collaborative process

In the Ansell & Gash (2008) model, the collaborative process is cyclical rather than linear, and it is said that first of all, build trust through face-to-face dialogues, immerse themselves and dedication in the process, share understanding with each other, and achieve small results through this, which leads back to face-to-face dialogue. This is the overall process of communication and trust building and has a form of a virtuous cycle.

(1) Face-to-Face Dialogue (Good Faith Negotiation)

All collaborative governance occurs through face-to-face dialogues between stakeholders. As an agreement-oriented process, in order for stakeholders to identify opportunities for mutual benefit, a "thick communication" through direct dialogue is required (Ansell & Gash, 2008). Trust, mutual respect, understanding sharing, and commitment to this process are keys (Gilliam et al., 2002; Ansell & Gash, 2008). Bohyeonsan Dam governance was faithful to face-to-face dialogue through regular meetings every month. In addition, regardless of the presence or absence of pending issues, all employees including the head of the Dam office frequently communicated face-to-face with village chiefs, creating favourable conditions for negotiations in good faith.

(2) Trust Building

Even in collaborative governance, when various stakeholders from different environments gather, the lack of trust between each other is a common beginning, and building mutual trust is a time-consuming process that requires long-term efforts to achieve collaborative results (Ansell & Gash, 2008). In the case of Bohyeonsan Dam governance, in addition to regular meetings and occasional communication held every month, mutual trust was further strengthened through a process of seeking common interest and solutions for village issues.

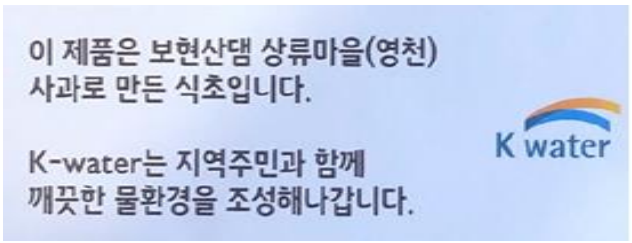
For example, in 2019, seven typhoons, including “Danas” and “Mitak,” affected South Korea, the largest number since the typhoon was observed in 1950, and especially the time was just before harvest, generating bruised apples exceeding 30 tons (20kg x 1,500boxes) in the upstream of the dam. As large quantities of bruised apples occurred in nearby areas as well, residents could not sell piles of bruised apples in spite of bargain prices. In previous years, the Neunggeum Association provided purchases with government subsidies, but in 2019, even those subsidies were exhausted early. In the past, in that case, most of them were abandoned in rivers, which immediately led to river pollution. In response, K-water made efforts to look for an apple processing company that can process bruised apples to prevent water pollution and help residents economically, and after many twists and turns, it was able to secure an apple vinegar processing company. Residents were able to sell bruised apples at a good price as raw materials for apple vinegar, the apple vinegar processing company made apple vinegars with these apples and K-water purchased more than 5,000 bottles of vinegar from them, and has promoted apples as local specialties of the Bohyeonsan Dam area (Figure 9, 10). Furthermore, residents highly appreciated K-water's efforts to find a solution while considering their problems together the apple vinegar made in this way, and it also played a role in making residents promote efforts to improve the water environment. This served as an opportunity for residents to build mutual trust and more actively participate and collaborate in the comprehensive measures of the improvement of the water environment. In addition, as a successful collaborative case with residents to improve the water quality of Bohyeonsan Dam, it has been highly regarded by local governments and external institutions as well as internal of K-water.

(3) Commitment to Process (Mutual recognition of interdependence, Shared Ownership of Process, Openness to Exploring, Mutual Gains)

The degree of commitment of stakeholders to collaborative is an important variable

explaining the success and failure of collaborative governance (Margerum, 2001; Tett, Crowther and O'Hara, 2003). Margerum (2002) emphasized in a survey of collaborative groups in the United States and Australia that "members' commitment" is the most important factor in promoting collaboration, and Ansell & Gash (2008) said commitment is closely related to

Figure 9. Apple vinegar made from apples of the upstream of the Bohyeonsan Dam



This product is vinegar made from apples in the upstream river basin (Yeongcheon-si) of Bohyeonsan Dam.

K-water builds up a clean water environment with local residents.

Figure 10. Attached sticker on the vinegar bottle

the original motivation to participate in collaborative governance. First of all, commitment presupposes a common perception of a specific problem of "joint evaluation" (Gray, 1989). Commitment is linked to the trust of other stakeholders that their perspectives and interests will be respected, and that the procedure will proceed clearly, fairly and transparently (Gilliam et al., 2002). Furthermore, commitment, along with other stakeholders, means the right to make decisions and shared responsibility for the decision-making process (Ansell & Gash, 2008). In the Bohyeonsan Dam governance, it was clear that the improvement of the water environment is for the common interest of residents and river basin manager, and that it has been being conducted fairly and transparently in writing at the monthly subcommittee. In addition, by supporting incentives for residents to participate in the improvement of the water environment efforts, residents were able to have trust that their perspectives and interests were sufficiently respected. The original sense of responsibility for the rivers in their own hometown was also added, and the decision-making power and common responsibility for the participation of residents have been successfully established.

(4) Shared Understanding

In the collaborative process, a common understanding of what stakeholders can achieve jointly must be developed (O'Hara, 2003). Development into defining problems and sharing

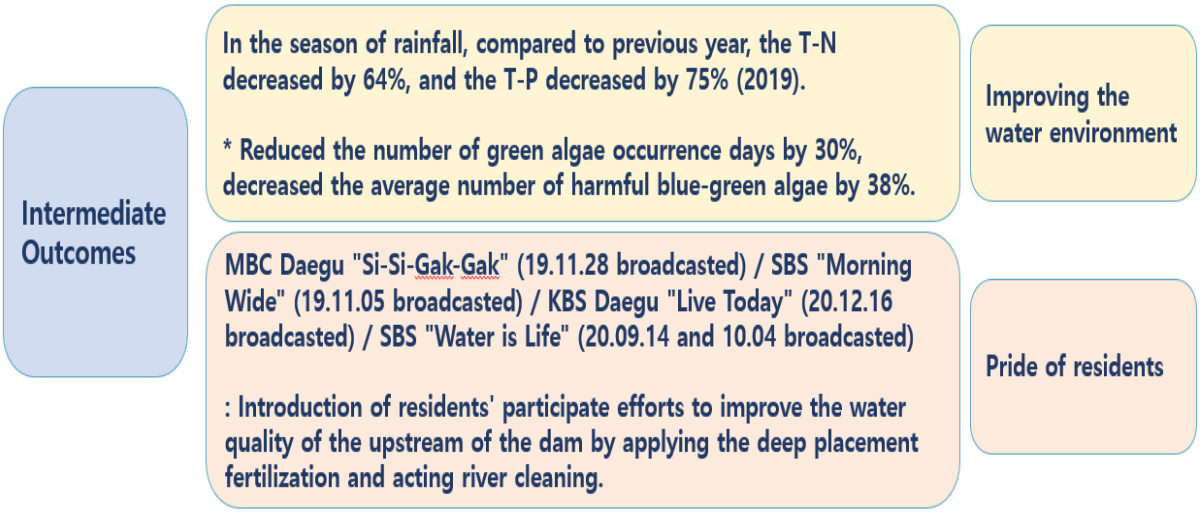
what to achieve on a particular issue, and requiring consensus on the appropriate knowledge required to solve problems, and the development of sharing understanding can be seen as part of a larger "collaborative learning process" (Ansell & Gash, 2008). Bohyeonsan Dam governance was given a clear mission to improve the water quality upstream of Bohyeonsan Dam by residents' participation. Through monthly subcommittee, residents' participation and practice have been promoted by regularly sharing the progress and plans of the implementation of the water environment comprehensive measures and continuously emphasizing how important the role of residents in water environment management. The upstream basin of Bohyeonsan Dam is an environment where residents live, and the responsibility to keep the river in their own hometown clean and pass the river on to their descendants and the pride that residents directly participate in the project have clarified common problems and common values. When cooperation means one-sided assistance or accessory participation, but collaboration means a common perception and mutual collaboration of common problems and directions. Therefore, Bohyeonsan Dam Governance recognized the common problem that living sewage and fertilizer were acting as a major pollutant for green algae in the clear mission of improving the water environment with stakeholders, and recognized the common value of residents' active participation through living practice.

(5) Intermediate Outcomes (Small Wins, Strategic Plans, Joint Fact-Finding)

Collaboration is likely to follow when the possible purposes and benefits of collaboration are relatively specific and "small wins" are possible (Chrislip and Larson, 1994). These intermediate results may represent tangible results in themselves, but they mean important process results as an essential driving force that leads to successful collaboration (Ansell & Gash, 2008). These small successes can be reflected again in the collaborative process while promoting a virtuous cycle of trust building and commitment. Bohyeonsan Dam governance is an exemplary case in which residents participate in the promotion of the water environment, and has been reported to the media several times, thereby inspiring residents' pride. The actual water quality monitoring results also showed positive results that T-N and T-P decreased, and the average number of green algae occurrences days and average cell counts decreased, although there was a limitation that there was big room for change due to temperature and rainfall. In addition, as the results have been shared with the residents, the residents have been able to feel a "small wins", which have allowed them to maintain the sustainability of collaboration.

5-2-5. Outcomes of Collaborative Governance

Due to the characteristics of the Bohyeonsan Dam river basin, the range of water quality changes according to temperature and rainfall conditions is quite large. However, changes in



<Figure 11. Intermediate outcomes of Bohyeonsan Dam governance cases>

residents' perception of the water environment, pride of participating in the improvement, settlement of participation activities such as sorting out the trash and food waste and prohibition from dumping trash into the river, sharing mutual trust and understanding established between K-water and residents, and water quality monitoring figures showing positive improvement results clearly have shown success of Collaborative Governance. In addition, as this governance will continue to participate and collaborate in improving the water environment based on real communication and mutual trust, so it will be said to be ongoing.

> "As time went by, I realized that the environment was very important. When the ditch became clean, people changed their consciousness and didn't throw away trash." (Resident's Interview, Environment White Paper, 2019)

> "At the beginning of each month, the meeting with the heads of the village and K-water holds and I think this meeting is the basis of everything. Through this meeting, we can narrow our opinions between villages and villages, villages and K-water, and I can insist my opinion. I think it's the most important thing to coordinate our opinions and make the right decision." (Resident's Interview, Environment White Paper, 2019)

> "Recycling food waste was not just smooth. However, I thought it was good for the village environment and practiced it patiently. The villagers are getting used to it, and more and more people are actively using it." (Resident's Interview, Environment White Paper, 2019)

"I can feel that the surrounding environment is getting cleaner due to the deep placement fertilization. As the environment changes, the residents like it and are talking about keeping it." (Resident's Interview, Environment White Paper, 2020)

"The employees of Bohyeonsan Dam Office often visited the village and listened to the elderly a lot, and asked after us. I feel like they are my grandchildren." (Resident's Interview, Environment White Paper, 2020)

5-3. Analysis implications: Differences and complementary points from existing models

The Bohyeonsan Dam collaborative governance with residents' participation has been led by the Subcommittee of the upstream of Dam of the Bohyeon-ho Win-Win Development Council institutionalized for improvement of the water environment in Bohyeonsan Dam river basin. Residents has participated in the decision-making process, and played an important role in comprehensive measures. The Bohyeonsan Dam governance has operated consensus-oriented by establishing mutual trust and devoted participation according to formal deliberation processes and procedures. Therefore, it could be said to correspond to the success factors of collaborative governance established by Ansell and Gash (2008).

Meanwhile, Cho and Kim (2009) said that in this model, the order of collaborative processes is not circulated into build trust through face-to-face dialogues, immerse themselves and dedication in the process, share understanding with each other, and achieve small results through this, which leads back to face-to-face dialogue. Through their study, they insisted on the change of the order that first shared understanding through face-to-face dialogues, and trust was built after obtaining intermediate outcomes and modified that leadership intervenes from the beginning.

However, as a result of examining Bohyeonsan Dam collaborative governance with residents' participation, face-to-face dialogue rather establishes a sense of purpose so that they can share mutual understanding and face the same direction. As the number of mutual understanding and communication increases, mutual trust becomes stronger, which encourages stakeholders to participate devotedly. Through the participation and commitment to process, as achieving intermediate results makes stakeholders feel relief that they have done well, and expect that they can move forward further. Therefore, in this study, as in Ansell and Gash (2008), it could be seen that build trust through face-to-face dialogues, immerse themselves and dedication in the process, share understanding with each other, and achieve small results

through this, which leads back to face-to-face dialogue. In addition, I cannot agree that we have to consider the timing of leadership from the beginning, and I would maintain the framework of the existing model in the sense that leadership should act as an essential facilitator for all stages of the collaborative process.

In the existing model, the same weight is assigned to all stakeholders related to their committed participation, and expressed them just as one factor. However, in the Bohyeonsan Dam residents' participation governance, I would like to give the largest weight to residents' participation especially, among stakeholders. Because residents' practice in their lives occupies an important position as parts of the comprehensive measures for water environment. As I mentioned earlier, the maturity of civil society, civic capabilities, and willingness to participate in policies has increased. Furthermore, residents of Bohyeonsan Dam governance had to take the risk of changing their decades-old farming methods and replacing their lives' style with hassle, all of which was possible with everyone's enthusiasm and agreement. In addition, the Bohyeonsan Dam governance case can be said to have empirically confirmed that the scope of citizens' participation is endless in that it was implemented in a small rural town, along with relatively elderly residents. In modern society, citizens are no longer unilateral beneficiaries or passive recipients of top-down policies. They are one of the main actors of direct participation while speaking out in the entire process of policy planning-establishment-execution-feedback, and so are even elderly residents in small rural town.

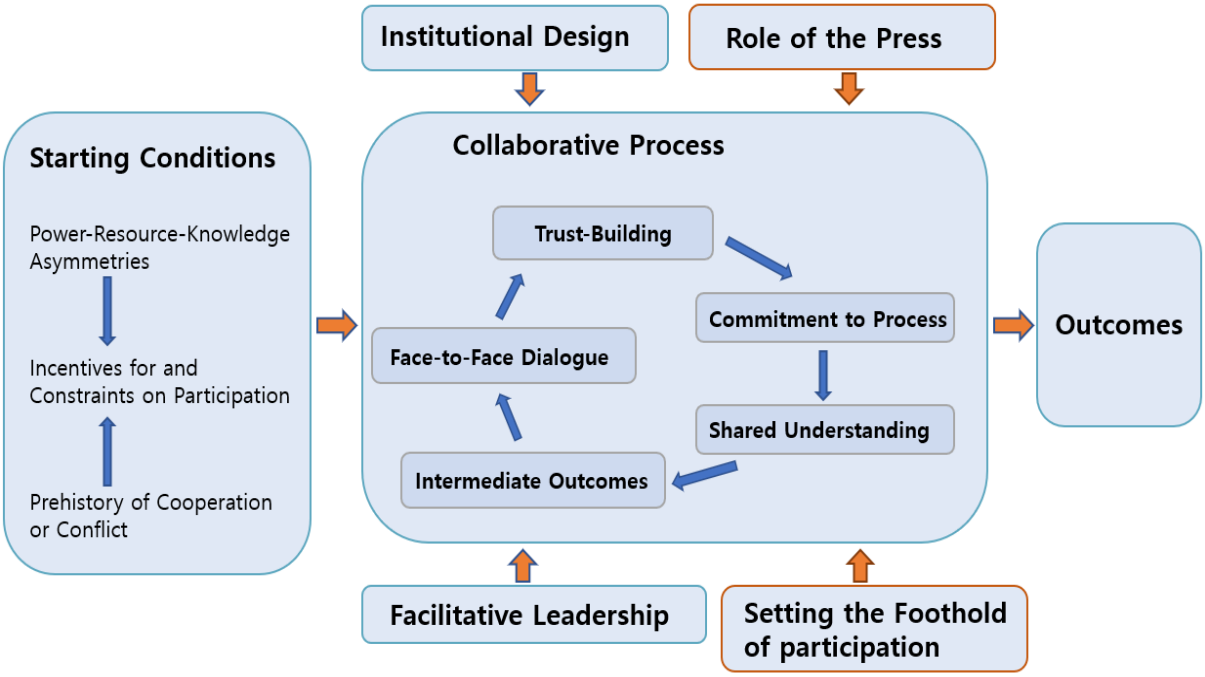
In addition, in the governance of residents' participation in Bohyeonsan Dam, positive media reports can be said to have encouraged residents' pride and strengthened their participation, but the role of the media was not presented in the existing model. In a study that analysed the success factors of collaborative governance based on the Taehwa River case (Bae & Kang, 2018), the role of the media and the importance of local community consciousness are also seen as additional success factors. So, in this study, the role of the media in inspiring the pride of residents would be viewed as an additional success factor.

Furthermore, efforts to encourage residents to participate in the collaborative process with a mature mind in an equal position and lay the foundation will be an additional success factor. On a different level from commitment/immersion within the collaborative process, it means drawing the participation of stakeholders so that the overall collaborative process can start and proceed smoothly. It includes creating an atmosphere so that stakeholders can freely participate and strengthening their capabilities to express their opinions. Ansell & Gash (2008) explained the starting conditions and stated that if some stakeholders do not have the ability to participate, the collaborative governance process is likely to be manipulated by stronger actors, but they

did not present separately securing stakeholders' capabilities or creating free participation conditions as a success factor. However, if the participation of stakeholders is inevitably passive due to the imbalance between power and resources, I think it is important to lay the foundation for stakeholders to participate smoothly in the collaborative process.

In the Bohyeonsan Dam governance, K-water has held a presentation for residents several times and individually visited and persuaded residents to participate as major stakeholders, and distributed leaflets by making it easy for residents to understand what green algae are, what causes green algae, and what to practice to reduce pollutants. The residents' environmental education was also conducted to strengthen the residents' capabilities. In addition, all employees of Bohyeonsan Dam office spared no effort to visit and communicate with the local residents from house to house from time to time related to their own work or social contribution activities.

The success factors model of collaborative governance reflecting the empirical analysis of the Bohyeonsan Dam improvement of the water environment governance case is as follows.



<Figure 12. Modified Success factors of Collaborative Governance>

Meanwhile, many studies have approached collaborative governance as a solution mechanism or a means of solving problems in public conflict. Kim (2008) emphasized that although interest in alternative dispute resolution has increased in order to solve the conflict problems surrounding many policy issues in our society, we should pay attention to collaborative governance, and stressed that it is not important to resolve the conflict from an

active perspective, but that efforts to enhance common understanding and convert conflicting relationships into collaborative relationships by raising the level. Regarding to this relationship, I would like to add a new perspective as an extension of customer management with the Bohyeonsan Dam resident participation governance.

In modern society, as the level of consciousness of citizens increases, the level of expectation of customers increases, and as a result, the level of management of customer relationships of companies is increasing. Not only private companies, but also government and public companies are expanding and organizing their concerns and efforts to manage customer relationships to the general public or citizens. Companies began to form a relationship with customers for long-term growth not just by simply receiving post-assessment after experiencing goods or services, but also by collecting diverse and complex opinions from customers and making them engage. It is changing from the existing method of providing unilateral goods or services of a company to a two-way communication and bottom-up relationship. These days, customer relationship management goes beyond customer satisfaction and establishes a corporate image based on customer trust. In addition, each company's relationship with customers is reflected in its sense of mission and vision, serving as a reason for the company's long-term existence. Achieving profit goals for both companies and customers through interaction and fulfilment of promises is important in building, developing, and strengthening relationships with customers to secure and maintain customer satisfaction and loyalty (Grönroos, 1991). It is no exaggeration to say that the success of a company depends on its customers who actually need the product or service provided by the company, and the customer would participate in every step from development to change by continuing commenting and monitoring. The importance of customer participation for long-term growth and win-win development with customers is being emphasized through customer brand commitment, brand trust building, and substantial communication with customers, away from simple customer relationship management like asking their opinion.

The range of customers in the public sector expands to the general public. In terms of water resource management, customers include not only consumers who receive water from the dam, but also residents living near the dam. The dam is an important resource in the region, and the management status of the dam storage area is actually monitored by residents in real time. The formation of a positive image of residents is linked to the establishment of a corporate image, and when promoting a project, it affects the friendly collaboration of residents. As such, customers in the public sector can be widely recognized. K-water is a public company in Korea specialized in water resource development and management, especially when it comes to water

resource development and management, and when the government declared unification of water management in 2018, K-water's business area expanded to water quality and ecosystem conservation. The Bohyeonsan Dam Water Environment Management Comprehensive Measures has set an environment in which customers as residents can actively participate and strengthened their sense of participation. This is because customers were not only beneficiaries of unilateral services, but also participants to recognize common values and roles of participation, and to feel pride through participation by playing the role of improvement of the water environment. Rather than having a separate position with the company, it can be said that customers have achieved win-win results in forming close relationships through interaction, building trust with the company, and sharing profits with the company. Furthermore, through mutual communication with customers and trust building, K-water laid the foundation for greater growth in the long run. In addition, the case of manufacturing apple vinegar using bruised apples in 2019 can be seen as a good example as a moment of truth (MOT) that impressed customers.

6. How to apply and activate K-water on-site governance

Bohyeonsan Dam Governance, which is the first case residents have participated in improving the water environment of the upper stream basin of the Dam in K-water, and is evaluated as a successful collaborative governance based on mutual trust and practical communication with residents. In the existing K-water field governance, residents' participation and communication were fragmented and limited. Their participation was allowed just formally and passively, such as collecting simple opinions and participating in formal meetings. The role of residents in the dam across the country is beyond the simple role of consumers, and the role of co-manager to improve the water environment of the upstream river basin of the dam should be given and respected. Conditions for residents to actively and practically participate should be prepared, away from formal and passive participation, such as collecting simple opinions and participating in formal meetings. To this end, residents' participation should be systematically specified, residents' perceptions and participation capabilities should be strengthened, and employees' capabilities and facilitative leadership as a communication channel with residents should also be strengthened. Residents' participation will strengthen communication and trust, and just as citizens' participation increases the acceptance of government policies, and it will increase residents' acceptance in water

management and lead to collaboration.

6-1. Securing residents' participation

In terms of water environment management in the upstream river basin of the Dam, residents should be systematically guaranteed to act as co-managers. Through this, residents should recognize their important roles and allow their participation to become commonplace and habitual. In addition, it is important to promote regular meetings and use documents to make residents aware that their voices and participation activities are being recorded and formalized. Bohyeonsan Dam Governance distributed written data explicitly prepared at the Subcommittee of the Upstream of Dam meeting held every month, including the contents of previous meetings and the main agenda of current ones, to ensure that residents are equal. It is believed that making residents feel proud of participating in the promotion of the water environment is also effective for strengthening communication and building trust.

Democratic competence is required for the people to function as the subject of the state (Lee, 1995). As constitutional suffrage and local autonomy are guaranteed while aiming for an open and participatory government in modern society, public participation is a right and duty of the people (Articles 13 and 117 of the Korean Constitution). Therefore, the government should expand education to strengthen self-government capabilities and increase trained citizens. This is the same as the corresponding competency required for residents to play an equal role in collaborative governance. As mentioned previously, Ansell & Gash (2008) stated that the collaborative governance process is more likely to be manipulated by stronger actors if some stakeholders do not have the capacity, organization, status, or resources to participate or are unable to participate on an equal basis with other stakeholders. In order to strengthen residents' capabilities, a continuous and systematic education system should be supported not only in terms of knowledge to understand the water environment and pollution of residents, but also in ways to express opinions, awareness of the importance of residents' roles, and pride. Through this, residents will be able to recognize their role as equal subjects in collaborative governance and establish active participation activities. For example, Busan City introduced a phased education system in which ordinary citizens can grow into "activists → civic activists → village coordinators → village instructors → village consultants → village chief of the project" (Kim, 2015).

6-2. Strengthening employees' competency

Employees' competencies should be strengthened to communicate and make trust building with residents. Employees can be approached in terms of customer relationship management. Organizational manpower management is very important in that implementing projects and realizing innovation depends on people. Employees should adapt to a new way of thinking that respects residents as equal subjects in governance and take customer-oriented actions. Success in customer relationship management depends on how many members of the organization are more emotional about the change and are attached to customers (Kim, 2009). Customer-oriented internalization education for employees, experience sharing opportunities through workshops, and compensation for their immersion and dedication should be systematically and continuously achieved. Employees should be able to have pride in their immersion and dedication.

In addition, it is important to elicit acceptance of changes in residents and employees through facilitating leadership. Facilitating leaders have the potential to encourage members of the organization to consider and accept changes in relationship management. The leader allows them to respond more flexibly to accommodate change and encourages participation in the process, providing opportunities to participate in planned changes (Strauss & Frost, 2002). As can be seen from Bohyeonsan Dam governance, facilitative leadership is one of the success factors for collaborative governance, which plays an important role in ensuring that residents can actively participate externally as well as motivating internal organizational members. So, not only the education of competency building training for employees but also the education of facilitative leadership for the heads of the offices should be conducted side by side for the success of collaborative governance.

6-3. Transparency, information disclosure

Securing transparency is directly related to fairness in a situation where various stakeholders are gathered. Therefore, information between stakeholders of governance should be transparently disclosed to ensure fairness and supplement information asymmetry. As mentioned earlier, in the case of Bohyeonsan Dam governance, by distributing documents at

regular meetings, it was recognized that residents' opinions and participation activities were being recorded and officially carried out. At the monthly Subcommittee of the upstream of Dam meeting, written materials that explicitly prepared the contents of the last meeting and the main agenda of this meeting were distributed to respect and reflect their opinions, and to increase residents' trust and immersion.

6-4. Data management

The importance of data management in the era of big data is obvious. Through resident participation governance, valuable data on pending issues, resident needs, resident roles, and governance responses will be accumulated. Systematic management will be needed for this accumulated data. This will be an important reference material for communication and trust building of residents, and can be used as a basis for diagnosing the past and present collaborative relationship and reviewing future improvement directions or as an educational material for customer relationship management.

7. Conclusion

In this study, the success factors of collaborative governance were analysed through the Bohyeonsan Dam governance centred on resident participation for improvement of the water environment. Just as the government or local governments promote public policies, it is inevitable for K-water, a public company that comprehensively manages public goods, to obtain collaboration from residents. In addition, the success of collaborative governance was essential in that the comprehensive water environment management measure of Bohyeonsan Dam included a number of tasks based on the practice of the upstream river base of the Dam residents. The Bohyeonsan Dam governance is an example of successful collaborative governance. Through the Bohyeonsan Dam governance, K-water did its best efforts to actually communicate with residents and build trust, away from the existing static and formal governance composition and operation. Also, residents' participation that they changed their existing farming methods and lifestyles to improve the water environment on their own stood out in this governance. As success factors in the representative Ansell & Gash (2008) model of collaborative governance, Starting Conditions (Power-Resource-Knowledge Asymmetries,

Incentives for and Constraints on Participation, Prehistory of Cooperation or Conflict) – Collaborative Process (Face-To-Face Dialogue, Trust Building, Commitment to Process, Shared Understanding, Intermediate Outcome) - Outcome could be said to correspond to the case of Bohyeonsan Dam governance. I suggested two success factors, the Role of the Press and Setting the Foothold of participation as additional factors in this study. I also added the perspective that the resident's participation is linked with customer relationship management. Furthermore, I proposed specific measures to apply this to the on-site governance of the K-water dam basin across the country. However, this is based on the analysis of the Bohyeonsan Dam governance for improvement of the water environment, and limitations to generalization may be recognized due to specific characteristics such as Bohyeonsan Dam river basin characteristics, driving power as a testbed, and tendency of upstream residents of the dam. Nevertheless, if the collaborative governance with residents will be established and expanded at each Dam site by reflecting the success factors derived from the case of the Bohyeonsan Dam governance, sustainable win-win development of residents and K-water can be expected.

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