

# Competing Models of Fishing Community Performance in Korea

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## Abstract

This study tries to find the most important factors and the most relevant Model of fishing community performance in Korea. The important research results are as following. i) The most important factor to get high performance of a community is preparing proper rules to the community condition. ii) The second important one is reflecting community conditions, and the ideas and preference of community members in community rule making process. iii) The third important factor is behavior including by transformational leadership. Even though behavioral factor is less important than the institutional factor, it is also important in achieving high performance. iv) Relatively less important factor is ecological environment including the occurrence of red tide. Only the level of fishery governance of a basic local autonomous government influences significantly on the performance of a community. But, contrary to our expectation social ecological environment does not greatly influence performance. v) Comprehensive Model explains most the performance of a community, but it is too much complex and needs too much data. Therefore, Institutional Model is most relevant in explaining the performance of a fishing community in Korea.

**Key Words:** institutional model, behavioral model, environmental model, comprehensive model, coastal fishing community, performance, transformational leadership, servant leadership, transactional leadership

## I . Introduction

Human beings work and act as members of an organization or a community in daily life. The members of firms, NGOs, and other many organizations and communities as well as government organizations share goals, and try to achieve high performance through collaboration and cooperation with their members together. Various managerial skills and techniques that can help achieve high performance have been made and developed through the years in public

administration and business administration.

Scholars from different fields often consider that the performance of an organization or a community depends greatly on different factors. Institutionalists assert that good institutions are necessary to achieve high performance such as sustainable development of common pool resources (CPRs) of an interdependent community. CPRs are natural or man-made resources in which exclusion is difficult and resource yield is subtractable. Fugitive fishery resources as one of CPRs are inherently difficult to partition using a property-rights system (Hackett, 1992: 325). For this reason, they argue that it requires a set of rules to guide the members' activities in the interdependent community. Unlike this perspective, behaviorists argue that high performance of an organization or a community requires proper leadership or communication. Environmentalists also assert that environment also greatly influences the performance of a community, and therefore they should consider the social and ecological system for high performance. None the less, it is not clear whether it is the institution or the environment that leads to high performance. The institution, or a set of rules, which is made by the government outside of the community is not always considered as an environment, but if they can choose it by themselves, guiding their work, it is considered as an internal institution.

Unlike those perspectives, Ostrom (2010) recently argued that we should have a more comprehensive perspective to guide our research and study. By this perspective, there are too many variables we have to review. Because there are too many variables for one research, we choose important variables and decrease the number of variables in our research. In fact, my previous study was on the influences of institutions, leadership, trust, and social ecological system on the performance of collective activities (Kim, 2014). It was too complex, making the relative importance of the institution, leadership, and social ecological system unclear. It was partly due to the difficulty of correctly classifying many variables into 3 categories.

In this context, for an accurate study, it is important to classify more clearly the variables into 3 categories as institution, behavior, and environment. With this classification, this study tries to find which factor is the most important among them for high performance of an interdependent fishing community, and finally to analyze how well the model explains the performance of the fishing community.

## II. Institution, Behavior, Environment, and the Performance of a Fishing Community

### 1. Institution

Recently, there is an academic trend of studies that tries to explain political, economic, and social phenomena with institution as a central concept. This stream is called New Institutionalism. It has various sub-new institutionalisms, but rational choice institutionalism is considered the most important in explaining the performance of a community. By rational choice institutionalism, law or institution works as structural restricting factor that influences the action of community members, shows a pattern of interaction (Ha, 2002: 7), and that influences the performance of a community. Therefore, central to many definitions of institutions is the notion of human designed constraints. By constraining behavior, institutions increase the predictability of human interactions, and make it possible for some activities that would not otherwise be possible. The key aspects of all institutions are shared rules about what actions individuals must take, must not take, or permitted to take in particular settings (Crawford and Ostrom, 1995; Ostrom, Gibson, Shivakumar, and Andersson, 2001: 5)

Originally, institution may be a set of rules or laws as formal restricting factor, norm and value system as informal restricting factor, or a semantic system that members of a community share, and consider as natural. Rules are predictably enforced by agents responsible to external authorities or to those directly involved in monitoring conduct and in imposing sanctions. These prescriptions are the rules of the game that coordinate human interaction, structuring incentives in human exchange, whether political, social, or economic (North, 1990: 3; Ostrom, Gibson, Shivakumar, and Andersson, 2001: 5). Thus, rules can be defined as shared understandings among those involved that refer to enforced prescriptions about what actions are required, prohibited, or permitted (Ostrom, Gibson, Shivakumar, and Andersson, 2001: 289). Those rules may influence an actor's strategy, and may function as means to solve common problems that a community has (Ha, 2002: 7).

In this context, every community has a set of rules that provide guideline of members' activities. Those rules can be an incentive for individual or a group's activities, and at the same time they can bring about high performance through trust and cooperation without conflicts among members (Choi, 2000). Therefore, a set of rules are considered as the most important institution by the institutional approach (Tang, 1992). Hilton also studied institutional incentives for resource mobilization of irrigation systems in Nepal (1992: 283-308).

By the institutional approach scholars consider the members of a community as rational economic men, and set a framework of institutional analysis. Some important rules in the framework are boundary rule, scope rule, position rule, authority rule, aggregation rule, information rule, and payoff rule (Ostrom, Gardner, and Walker, 1997).

A community is composed by a set of members. It requires boundary rule which tells us who is the member, and who has the qualification of a member.<sup>1)</sup> It also requires a scope rule, which

defines what kind of work they do, and defines the scope of results which the actors of members influence. Aggregation rule defines the method and procedure of collective decisions in a community is also important (McKean, 1992: 275). There is also a position rule, which defines the kind of position, recruiting method of a person of a position, and the term of a position in a community. Authority rule defines the role and function of a person of a position. Finally, payoff rule defines the distribution of benefit and cost to the members is also important (Kim, 1998; Ostrom, 1990). Most of fishing communities have those rules, and all of the groups which have managed successfully the common pool resource have the characteristics of a community (Singleton and Taylor, 1982; Ostrom, 1992).

Then, what are the determinants of the performance of an interdependent community? First of all, the performance may be decided by the relevance of the rules even though they have the rules. That is, how the rules reflect the situation of the common pool resource may influence the trust and cooperation of members, and then the performance of a community which manages and shares the common pool resources may differ depending on the relevance of the rules (Ostrom, 2010; Kim, 1998). Most communities which manage the common pool resources make the rules, but the relevance of the rules matters. Therefore the relevance of the rules influences the collective activities through trust and cooperation of the members of a community, and influences the performance of the community in the end (Kim, 2015).

Second, in addition to the relevance of the rules, the rationality of rule making process may also influence the performance of a community. This means that if the process reflects the opinions of the members of a community, the conditions of the resources, and the regional situations of the community well, and the consensus was made harmoniously, then the rule making process can be considered rational. This is the rationality of rule making process that may influence the performance of the community. The relevance of the rules and rationality of the process are the internal characteristics of a community.

A set of rules which define 'who does what' between government and members of a community are also important in management of the fisheries. The institutions as a style of resource management are classified into three categories. Depending on the roles between government and fishermen regarding resource evaluation, setting managerial goal and means, allocation of quotas, and superintendence observation, institutions of fishing management are classified into

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1) Ostrom (1990) emphasizes that it requires self-governance to manage CPRs most efficiently. But, in recent, Ministry of Oceans and Fisheries of Korean government criticized that the fishing community set too high barrier to entry of a fishing community, and declared to lower the barrier through standardizing the residence period and lowering the membership fee (Kukje-Shinmoon, 2017.10.10). It may be counteractive to the principle of self-governance of CPRs, and thus we have to review their negative side effects.

government management style, cooperative management style, and self-management style (Ministry of Marine Affairs, 2003). The government management style is performed by the government direct order, and the self-management is performed by the association of the fishermen. The cooperative management style is performed together by the government and the association of the fishermen. In fact, this institution is not made by the community. So it seems to be an external environmental problem to the community that government officials make rules and interpret the rules, and enforce the rules for the solution of CPR problems. But it is the fishing community that can choose the managerial style of fisheries resources. By this reason, we can consider this factor as an institution of internal characteristics of a community.

Taken together, we can set a Hypothetical Institutional Model, "The performance of a fishing community is most greatly determined by the factor of the institution, including relevance of rules, rationality of rule making process, and management type."

## 2. Behavior

The basic point about political and social phenomena is that they consist or result from the actions of human beings (Van Dyke, 1960: 23). It would seem difficult to deny that humans are the fundamental elements of politics and public administration (Isaak, 1981: 199). In this context, human behavior can be central in explaining politics and other various social phenomena.

Many institutionalists consider that human beings are rational trying to maximize their benefits, and that their actions are determined by the context. They also consider those situations are greatly determined by the institutions. But, even though there is no institutional change in a community, there can be a great change in collective action, and it brings about high performance of the community. It is because the performance can be influenced by many other factors besides institution. One of the factors is leadership of the representative of a community.

In fact, the concept of leadership has changed across time (Northouse, 2013: 1-4). In recent, team leadership, defined as leadership in organizational work teams, has become one of the most popular and rapidly growing areas of leadership theory and research. In fact, a team is a specific type of group composed of members who are interdependent, who share common goals, and who must coordinate their activities to accomplish these goals (Hill, 2013: 287). Thus, a team has specified roles for its members with requisite knowledge and skills to perform these roles (Levi, 2011; Hill, 2013: 287). And authentic leadership also represents one of the newest areas of leadership research. It focuses on whether leadership is genuine and real. Authentic leadership concerns with the authenticity of leaders and their leadership (Northouse, 2013: 253).

Among the various leadership types, transformational leadership has been focused for the

research since 1980. Transformational leadership which concerns with the charismatic and affective factor of the leadership is a part of new leadership paradigm of Bryman (1992). Many scholars consider that transformational leadership takes possession of central point in many researches (Northouse, 2013: 185).

There are some arguments on the conceptual components of the transformational leadership and its measurement. Transformational leadership is concerned with improving the performance of followers and developing followers to their fullest potential (Avolio, 1999; Bass & Avolio, 1990). Bass(1985: 20) argued that transformational leadership motives followers to do more than expected by (a) raising followers' levels of consciousness about the importance and value of specified and idealized goals, (b) getting followers to transcend their own self-interest for the sake of the team or organization, and (c) moving followers to address higher level need (Northouse, 2013: 190). Northouse (2013: 191-193) asserted that transformational leadership is composed with sub-factors of idealized influence, charisma, inspirational motivation, intellectual stimulation, and individual consideration.

Unlike transformational leadership, transactional leadership that does not individualize the needs of subordinates or focus on their personal development is also emphasized. Transactional leaders exchange things of value with subordinates to advance their own and their subordinates' agendas (Kuhnert, 1994). In this context, transactional leaders can be influential because it is in the best interest of subordinates for them to do what the leader wants (Kuhnert & Lewis, 1987; Northouse, 2013: 195).

Recently servant leadership has spiked lots of interest among leadership scholars. Namely, Greenleaf (1970: 15) argued that servant leadership should begin with natural feeling that one wants to serve, to serve first. Servant leaders place the good of followers over their own self-interests and emphasize follower development. Servant leadership emphasizes that leaders be attentive to the concerns of their followers, empathize with them, and nature them. Servant leaders put followers first, empower them, and help them develop their personal capacities. Furthermore, servant leaders should be ethical (Northouse 2013: 219-220). Similarly, Van Dierendonck (2011: 1228-1261) argued that the key characteristics of servant leadership are conceptualizing, emotional healing, putting followers first, helping followers grow and succeed, behaving ethically, empowering, creating value for the community (Northouse 2013: 225).

If the leader of a community shows an excellent servant leadership, the members of the community can trust each other and cooperate with team building unite, bringing high performance of the community. From this viewpoint, servant leadership indirectly influences the performance of fishing community through trust and cooperation among members of the community (Kim, 2015: 585-612).

Through this argument, we can infer that the higher the levels of transformational, transactional, and servant leaderships are, the higher the performance of the community is. In this context, we can set a Hypothetical Behavioral Model, "The performance of interdependent fishing community is most greatly influenced by the behavioral factor including transformational, transactional, and servant leaderships.

### 3. Environment

Community is important for the solution of the CPR problems, but it is not sufficient. Therefore, many other factors are necessary for the solution of the CPR problems. Especially important is the impact of environment including economic market factors such as the construction of a road, dramatic change in the price, and the larger political regime in which a community is nested (Ostrom 1992: 346-347). Political regime can change the governmental policy of fisheries which greatly influence the performance of the fishing community.

In this context, Ostrom (2010: 42-43) taught us that the action situation of a community is influenced by the political, economic, and social environment and related ecological system, and called the two factors social-ecological system as environment. In the case of a researching the performance of a fishing community in a particular moment and in a state, the macro political, economic, and social environments are almost the same, but the social economic conditions may be different by the community. In this context, the level of governance that the local government use as a resolution for the policy problem related to the fisheries may be important as a social environment. The related ecological factor can be listed as climate pattern, water temperature, contamination pattern, and red tide.

Governance is widely used among scholars and practitioners, but the concept is not clearly defined. For example, Hackett (1992: 325) argued that heterogeneity complicates efficient governance structure; appropriation rights allocations cannot minimize both implementation costs and heterogeneous appropriation costs. He used governance as wide and general meaning of the word. On the other hand, in other studies governance means voluntary, autonomous, and self-organizing adjustment configuration within a civil society, and this is quite different from the state and the market mechanisms (Kim et al., 2000: 42; Peters and Pierre, 1998). They define widely governance as the process of enhancing the capacity of government through strategic inter-organizational cooperation with the actors outside government. In the same context, governance is considered as autonomous and horizontal heterarchy among the interdependent actors such as state, market, and civil society (Jessop, 2000).

All the conceptual definitions of many scholars taken together, governance can be defined as a

new style of adjustment configuration which interdependent government, market, and civil society interact and cooperate together in resolving public problems based on the voluntary participation and autonomy with establishment of horizontal network (Kim, 2006: 54).

The governance of fisheries of a local government means a configuration of which the basic local government like city, county, and borough interacts and collaborates with establishment of horizontal network based on voluntary participation and being autonomous with Ministry of Maritime Affairs and Fisheries, National Fisheries Research & Development Institute, National Federation of Fisheries Cooperatives, Korean Association of Self Governance of Fisheries, and Fishermen for the efficient management of the fisheries resource (Lee and Kim, 2001: 28; Kim, 2006: 54). The higher the level of fisheries governance of a local government is, the higher the performance of the fishing community is.

The performance of the fishing community is also influenced by the proper water temperature, affluent phytoplankton, zooplankton, the velocity of a moving fluid of water, and degree of the contamination (Schlager, Heikkila, 2009). Like this, the change of the water temperature, occurrence of the red tide, and contamination accident may bring about the exhaustion of marine resources.

Taken together, we can set a Hypothetical Environmental Model, "Environment such as the level of fisheries governance, and water temperature change, occurrence of red tide, and occurrence of an accident having ecological negative impact influences most greatly on the performance of a fishing community".

#### 4. Performance of Collective Action in a Community

The performance of a community is quite different from the individual performance. It also depends on the type of community. This study focuses on the fishing community. Therefore, we can say that the performance of a fishing community is increased when 1) common pool resources which the community shares together are well preserved, 2) the amount of fisheries resource which the community harvest is increased in quantity, 3) their quality is improved, 4) the community has stable income, and 5) the conflict which they experience in fishing activities is decreasing. In the past, in the case of coastal fisheries, it was important to harvest fisheries resources with the most sustainable production (Jang, 1994: 205-210). This is due to the improvement of fisheries productivity, income increase, and securement of the stable income (Kim, 2004). Unlike those positive indicators of the performance, the conflicts which can appear in the fishing activities are a negative indicator. Fishermen can compete with each other to get a better place in the sea, and in this process conflicts can occur (Schlager, 1990). On top of that,



the community should clean the fishing ground, keep working together and cooperate for sustainable production in community fishing activities. The conflicts come from the social trap of excessive harvest of fisheries resource and social fence due to the lack of common endeavors. The community members try to overcome this tragedy of social dilemma through cooperation (Ostrom, 1990; 2008). Therefore, decreasing the conflict is an important objective which the community tries to obtain. This conflict can be a negative indicator of performance of a fishing community. In this context, the important variables of performance of a fishing community may be measured by fishing productivity increase, income improvement, income stability, and conflict resolution.

### III. Competing Models of a Fishing Community Performance

#### 1. Model Setting and Inventory of Variables

From the above theoretical review, we can make 4 models of the performance of a fishing community.

##### 1) Institutional Model

Institutional model argues that the performance of a fishing community is largely determined by the institutional factors. That is, it emphasizes the relevance of a set of rules of fishing community and the rationality of its rule-making process as institutional arrangements. It will be debatable whether the rationality of rule-making process should be included as an institutional factor, or as a behavioral factor. But, it should be considered as an institutional factor. Considering whether the rules are proper and relevant with community condition can be said that it is the similar as defining public interest or rationality. The concept of public interest can be defined by the basis of substantiality theory and process theory, and the concept of rationality can be also defined by the substantiality theory and process theory. But, because the concept of public interest or rationality is so obscure, as long as they follow proper process of defining the concept, it can be said that the definition is proper and accurate. We can consider whether the rules are proper and are relevant with community condition based on whether they make rules of a community rationally. It means double face of institution. Besides, this model includes the

managerial style of fishing ground. It is on the type of role division in performing of management and evaluation of fishing ground. The reason why it should be included in institutional model is that fishing community can choose the managerial style by way of a contract with the basic autonomous government, and it can function as a set of rules guiding the community members' activities.

In this context, institutional model means that the performance of a fishing community can be largely determined by the relevance of a set of rules of a community, rationality of its rule making process, and management type of fishing ground.

Model 1: Institutional Model

Performance= f(Relevance of Rules, Rationality of Rule Making Process, Management Type)

## 2) Behavioral Model

Unlike institutional model, behavioral model assumes that the performance of a community is largely influenced by leadership of the representative of a community. Leadership model as well as institutional model considers the performance depends upon the behavior of community member. But, the former considers that it is largely determined by the leadership, but the latter considers that it is greatly influenced by the rules of a community. Not only the pattern of leadership, whether it is transformational leadership, or transactional leadership, or servant leadership, but also the level of leadership greatly influences the performance of a community. Thus, the model argues that we should find the most suitable leadership in order to improve the performance. In addition, there are many behavioral factors such as communication, trust, cooperation in organization or community, but they are greatly related by the leadership as well as a set of rules. Thus, those variables were excluded in the behavioral model.

In this context, the behavioral model considers that the performance of a community is largely influenced by the transformational leadership, transactional leadership, and servant leadership.

Model 2: Behavioral Model

Performance= f(Transformational Leadership, Transactional Leadership, Servant Leadership)

## 3) Environmental Model

Environmental Model means that the performance of a fishing community is greatly

determined by the environment of social ecological system which encompasses the community. Social, economic, and political environments as well as natural ecological environment influence the performance of fishing community. Especially, macro political system factors work the same to all the community in a particular time, but in longitudinal analysis the factors influence importantly the performance of a community. In addition, the level of the governance as a problem solving and adjustment mode of the basic autonomous local government may influence greatly the performance of a fishing community.

Model 3: Environmental Model

Performance= f(Governance Level, Water Temperature Change, Red Tide Occurrence, Ecological Event Occurrence, Location)

#### 4) Comprehensive Model

Ostrom(2010) argued in her “Updating the theory of collective action” that the activities were influenced by the various factors. Therefore, she suggested a wide framework which included social, economic, and political system, and related eco-system as environment, resource system, governance system, resource unit, and users for analysis of collective action. She considered that all the factors influenced the outcomes through interaction among them. Therefore, if we include all the factors for the analysis of collective action, then the analysis may be more relevant. But if it is too complex, we can also choose some important variables. In this context, if we want to analyze more correctly the performance of interdependent fishing community, we should try to use more variables. Therefore we can set a Hypothetical Comprehensive Model, “Institution, behavior, and social ecological environment can explain more the variance of the performance of a fishing community than other models.”

Model 4: Comprehensive Model

Performance= f(Relevance of Rules, Rationality of Rule Making Process, Management Type, Transformational Leadership, Transactional Leadership, Servant Leadership, Governance Level, Water Temperature Change, Red Tide Occurrence, Ecological Event Occurrence, Location)

#### 5) Inventory of Variables and Reliability

The important variables using in the 4 models of performance and reliability of their measures can be arranged in the following <Table 1>.

〈Table 1〉 Inventory of Important Variables and Reliability of Measures

Model & Variable	Variable	Measures	Remarks, Cronbach's- $\alpha$
Institutional Model	Relevance of Rules	■ Penalty and Restriction of Membership Rule, Fishing Order Maintenance Rule, Fishing Ground and Resource Management Rule, Membership Qualification Rule, Right and Duty Rule (Relevance of Each Rule)	.899
	Rationality of Rule Making Process	■ Opinion Reflection, Smooth Agreement, Reflection of Community Conditions	.797
	Management Type	■ Government Management, Collaborative Management, Self-Management	N/A
Behavioral Model	Transformational Leadership	■ Vision Presentation, Emphasis of Goal Attainment of Community, Consideration of Opinion and Emotion, Problem Solving with New Method, High Expectation of Subordinate	.721
	Transactional Leadership	■ Positive Evaluation, Assurance of Rewards, Performance Reward, Obvious Support	.885
	Servant Leadership	■ Listening, Understanding, Consideration, Acceptance, Difficulty Resolution	.936
	Governance Level	■ Close Collaboration, Opinion Coordination, Making Network, Voluntary Participation	.787
Environmental-Model	Water Temperature Change	■ Water Temperature Change or Not	N/A
	Red Tide Occurrence	■ Red Tide Occurrence or Not	N/A
	Ecological Event Occurrence	■ Ecological Event Occurrence or Not	N/A
	Location	■ Metropolitan City, City, Fishing Village	N/A
Dependent Variable	Performance	■ Fishing Productivity Increase, Income Improvement, Income Stability, Conflict Resolution	.821

In the 〈Table 1〉, the values of Cronbach's alpha of all the variables except dummy variables are above .70. Therefore, we can conclude that all the variables are reliable.

## 2. Research Design and Method of Data Collection

The unit of analysis in this study is a community of fishing boat fishery. Therefore all the values of variables such as leadership, performance of community, relevance of rules are calculated with the answers of the community members by the unit of a community.

The data used in this study are the ones which were collected for my previous research (Kim, 2014). In the study 147 communities were sampled from 196 communities of fishing boat fishery,

which were almost 75% of the population. There were two types of data in this research. One was about the characteristics of the community and the ecological traits of fishing ground which were from questionnaires of the representative of the community. The other was on leadership, the relevance of rules, rationality of rule making process, and community performance which were collected from questionnaires of community members. Interviews as pilot study were carried by visiting some communities of fishing boat fishery in Busan Metropolitan City. The main research was carried by mail survey for one month of March in 2014.

Questionnaires were collected from 64 communities, and 62 ones were used for the statistical analysis except two incredible ones. The reason of small rate of return was the difficulty of connection to the fishermen. It is very difficult to meet them. In this study total 640 questionnaires were collected from 10 members of each community. In addition, five interviews were carried from high performance communities, and six interviews were carried from low performance communities for qualitative studies. Those interview data were used for interpretation of the research results.

## IV. Research Results

The results of analysis by the Model can be shown in the <Table 2>.

<Table 2> the Results of Regression Analysis on the Community Performance

Model Independent. V	Institutional Model			Behavioral Model			Environmental Model			Comprehensive Model		
	B	$\beta$	p	B	$\beta$	p	B	$\beta$	p	B	$\beta$	p
(Cons)	.474		.366	.658		.443	2.586		.000	-.846		.241
Relevance of Rules	.475	.465	.001							.430	.462	.001
Rationality of Rule Making Process	.339	.281	.037							.338	.304	.015
Government Management #1	-.067	-.033	.737							-.158	-.075	.389
Collaborative Management #1	.311	.218	.030							.240	.179	.051
Transformational Leadership				.953	.619	.000				.651	.450	.001
Transactional Leadership				.132	.091	.552				.269	.192	.118
Servant Leadership				-.321	-.213	.211				-.534	-.368	.010
Governance Level							.276	.299	.032	-.089	-.098	.317
Water Temperature Change #2							.337	.189	.162	.182	.105	.230

Red Tide Occurrence #3						.095	.076	.577	.404	.334	.001
Ecological Event Occurrence						-.098	-.076	.608	-.198	-.159	.106
Location #4						-.076	-.034	.802	.020	.009	.918
F/p	14.176	.000	8.222	.000		1.697	.152	9.096		.000	
Adj.- R <sup>2</sup>	.464		.259			.059		.639			
N#5	62		63			57		56			

Dependent Variable: Performance of a Community

#: Dummy Variables. Criteria Variable: #1(Self-Management), #2(Non Occurrence), #3(Non Occurrence), #4(Small City and Fishing Village), #5 Difference of N is due to the missing values.

In the above results of analysis, independent variables of Institutional Model are relevance of rules content, rationality of rule making process, and management type. This model explains 46.4% of the variance of the performance of a community, and tells us how important the rules are in community activities. The better the rules reflect the conditions of the community, and then the higher the performance is. That is, the community which has relevant rules brings about high fishing productivity, income increase, more stable income, and less conflicts. And the more rational of rule making process is, and then the higher the performance of a community is. That is, in the rule making process the community which reflects well the members' opinions, the conditions of the resources and regional situations of the community, and makes harmoniously consensus brings about high performance. And when government and fishing community collaborate together for the management of fishery resources, the community can make higher performance than the community with government management, or self-management.

The second model is the Behavioral Model which emphasizes the leadership as the behavioral factors in the organization, explains 25.9% of the community performance. Especially, the transformational leadership which emphasizes the vision presentation, goal attainment of community, consideration of opinion and emotion, problem solving with new method, and high expectation of subordinate is very important for the high performance of the community.

The third model is the Environmental Model which emphasizes the fishery governance of local government as social political environment of the community, and ecological environment of the fishing ground including water temperature change, red tide occurrence, ecological event occurrence, and location for high performance. In the model, only the fishery governance of local government significantly influences on the performance of the community. The other variables do not influence significantly on the performance. The model explains only 5.9% of the performance, and the model is not significant. This tells us the Environmental Model is not proper in explaining the performance of fishing community.

The fourth model is the Comprehensive Model that all the factors such as institution, behavior, and environment influence on the performance. In the above results of the analysis, 63.9% of the

performance of a fishing community can be explained with three factors. This suggests that we should consider comprehensively all the factors including institution, behavior, and environment for high performance of a fishing community. Above all, the performance of the community, the relevance of the rule as an institutional factor is the most important variable influencing on the performance ( $\beta=.462$ ,  $p=.001$ ). The next important variable is transformational leadership ( $\beta=.450$ ,  $p=.001$ ). Like in Behavioral Model, transformational leadership, that is, the vision presentation, goal attainment of community, consideration of opinion and emotion, problem solving with new method, and high expectation of subordinate are required to the leader for high performance of the community. By the way, in the above results of the analysis servant leadership is also an important variable to explain the performance, but it influences negatively on the performance ( $\beta=-.368$ ,  $p=.010$ ). This hints us that it is not that the high level of servant leadership brings about low performance, but rather it is that the leader in the community of low performance shows high level of servant leadership. In regression analysis, we can infer the causation due to the covariance of two variables. Which is an independent variable or a dependent variable depends on theoretical arguments. It is the same that even though patrol of police man can reduce the crime occurrence, the patrol influences positively on crime occurrence of an area in regression analysis of patrol effects on crime occurrence. It means that police man patrols more in crime ridden district than other districts. Like this logic, we can infer that the leader in the community of low performance may show high level of servant leadership to try to resolve the dissatisfaction of members on low performance of fishing community.

Red tide occurrence also influence negatively on the performance ( $\beta=.334$ ,  $p=.001$ ). It is also adversary to our expectation. It means that if the red tide occurs in the fishing ground, then the members of the community cooperate positively together to cope with the difficulty of red tide occurrence. With the result, the community members may solve the conflicts and make high performance. Finally, the rationality of the rule making process also influences on high performance ( $\beta=.304$ ,  $p=.015$ ). It is the same result of the institutional model. It tells us that the rational process of rulemaking as well as the relevance of the rule itself is also important for high performance.

## V. Discussion and Conclusion

First, the best model to explain the performance of a fishing community is the Comprehensive Model. As the findings of this study shows, institutional factor explains 46.5% of the variance of the performance, and behavioral factor explains 25.9%. But if all the variables including

institutional, behavioral, and environmental factors are taken together in the equation, then the model explains 64.9% of the variance of community performance. This gives us insights that we should consider institution, behavior, and social ecological environment in order to improve the performance of interdependent fishing community. In fact, it was already emphasized in the 「Updating Theory of Collective Action」 (Ostrom, 2012), and it requires more complex and robust endeavors to study on this subject. And in order to bring about high performance of an interdependent fishing community, the members needs to set more relevant rules and they need to make the rule-making process more rational. The improvement of transformational leadership of the representative of a community is also required. That is, the representative of the community should try to do vision representation, consideration of opinions and feelings of members, problem resolution with new methods, and high expectation for subordinates.

Second, the Institutional Model is the most relevant to explain the performance of a fishing community with a few variables. From the results of this study, we can find that the most important variable of the performance of a fishing community is the institution. Followed by the leadership of the representative of an interdependent community is. Last are the environment variables. Of course, the question of whether the three important factors including institution, behavior, and environment were used in the analysis of the performance of the fishing community can be raised. Nevertheless, the fact that institutional variables can explain almost a half of the variance of the performance of the fishing community is a significant finding. Even though Comprehensive Model can explain more the variance of the performance than Institutional Model, it requires more cost and endeavors to gather and analyze all the data of the variables in the Comprehensive Model.

Third, the perspective that the Institutional Model is the most relevant to explain the performance of a fishing community is in the same context of various findings of many scholars of institutionalists (Ostrom, 1990; Ostrom, Gardner, and Walker, 1997; Mckean, 1992; Kim, 1998). In addition, Even though it is important that a community should have a set of rules for high performance, it is more important that the community has a set of relevant rules which reflects well community conditions.

Fourth, in addition to the relevance of rules, this study tells us that the rationality of rule-making process is also very important in high performance of an interdependent community. In fact, if the process is rational, then the result of the process may be also rational. Therefore, they consider the rationality of work process as very important in management of public sector.

Fifth, community brings about little performance with only community members' endeavors. The management type based on collaboration of National Federation of Fisheries Cooperatives as



well as other government institutions, such as the collaboration of National Fisheries Research and Development Institute, and The Fisheries Agency brings about higher performance than the other management type based on direct order or control of government, and self-governing fishery style.

Sixth, even though behavioral factor is less important than the institutional factor, it is also important in achieving high performance. Speaking more concretely, the higher the level of transformational leadership of the representative of a community is, the higher the performance of a fishing community is. Because the causal relationship between the policy tool and high performance, and the future of the community are usually not clear, the transformational leadership is considered important (Bass, 1985; Northouse, 2013). In fishing community the future is not unclear, so the servant leadership was considered important. But, contrary to expectation, we can find that transformational leadership is also important to get high performance in the interdependent fishing community. This research result is essentially in agreement with studies of Northouse (2013). But servant leadership influences negatively on the performance of a community, and the study result does not coincide in agreement with the studies of Northouse (2013). This result of analysis hints that the higher the level of conflicts among members of a community, the less the incomes of community members, and the more instable the income of the community, and then the higher the level of servant leadership of the representative of the community is.

Seventh, social ecological environment can be considered to influence importantly on the performance of fishing community, but contrary to expectation it does not greatly influence performance. Only the level of fishery governance of a basic local autonomous government influences significantly on the performance of a community. Additionally if we control other variables in the equation of Comprehensive Model, the tide as a variable of ecological environment influences the performance of a community. It is contrary of our expectation. The finding means that if the members of an interdependent community take an experience of tide occurrence, then they may cooperate together and achieve high performance of the community.

Finally, this study has several limits of research. Above all, various models in my study do not include all the important variables in each model. In case of behavioral model, even though team leadership and authentic leadership are relatively new areas of leadership, my study does not deal with them. In fact, fishing community is not a team, and therefore it is not proper to include the team leadership in my research. On the other hand authentic leadership, which can be included in my research, was also excluded because of research size and cost. Besides leadership, there are many other behavioral variables such as communication, trust, etc. in this behavioral model. For this reason, it may be more reasonable to change the Behavioral Model to Leadership Model.

But, it is not the author's meaning. It is to find which factor is more important among institution, behavior and environment to explain the performance of a community.

In the case of environmental model, we also do not deal with regional economic conditions because of difficulty of getting accurate such data. Originally, environment is composed by two factors in the concept of social ecological system. One is social, political, economic environment, and the other is ecological environment. Even in this perspective, many important variables of the former may be dropped in this analysis.

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## 국문 초록

## 한국 어업공동체 성과에 관한 경쟁적 모형에 관한 연구

김 인

본 연구는 한국 어업공동체 성과의 가장 중요한 요인들과 가장 적합한 모형을 찾고자 한다. 본 연구의 주요한 연구결과는 다음과 같다. 첫째, 공동체의 높은 성과를 위해서 가장 중요한 것은 공동체 상황에 적절한 규칙을 만드는 것이다. 둘째로 중요한 것은 공동체의 규칙 제정 과정에서 공동체의 상황과, 그리고 구성원들의 의견과 선호를 반영하는 것이다. 셋째로 중요한 것은 변혁적 리더십을 포함하는 행태적 요인이다. 이것은 비록 행태적 요인이 제도보다 중요하지는 않지만 높은 성과를 달성하는 데 역시 중요하다는 것이다. 넷째, 적조의 발생을 포함하는 생태적 환경은 상대적으로 덜 중요하다. 단지 기초자치단체의 수산거버넌스 수준만이 공동체 성과에 영향을 미치지만, 우리들의 기대와는 달리 사회생태적 환경은 성과에 크게 영향을 미치지 않는다. 끝으로, 이 연구에 따르면 공동체의 성과에 관한 종합모형이 가장 많은 것을 설명하지만 복잡하고 많은 자료를 필요로 하므로 간단한 제도모형이 한국의 어업공동체 성과를 설명하는 데 가장 적합하다.

주제어: 제도모형, 행태모형, 환경모형, 종합모형, 연안어업공동체, 성과 변혁적 리더십, 서번트 리더십, 거래적 리더십