

The Effects of Model Project of Self-Governing Coastal Fisheries in South Korea

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The Effects of Model Project of

I. Introduction

Recently, the study on government's role has raised a great concern in public administration (Kettl, 2000; Stoker, 2000). They assert that the work which we have thought government should do traditionally ought to be delegated to the private sector or to the self-governance system (Ostrom, 1998). This kind of discourse was reviewed seriously by the Department of Fisheries Management, Ministry of Maritime Affairs & Fisheries in South Korea. They thought that traditional government-initiated management system of coastal fisheries could not reflect regional fishing characteristics. In fact, the system brings about the conflicts between fishers and governmental officers as well as among fishers. Since July 2001 The Ministry of Maritime Affairs & Fisheries has enforced 'The Model Project of Self-governing Coastal Fisheries in Korea' since July 2001 to solve those problems, and to make fishers to participate positively in fostering their sustainable production base of fisheries.

The Ministry selected 79 model communities of self-governing fisheries which were administered under 11 Local Authorities of Maritime & Fisheries, in 2002. The fishing types of model fishing communities are village fishing, fostering fishing, fisher-boat fishing, and compound fishing. The ministry decided to enlarge the responsibility and power of fishers to manage of fishing ground, resources, and production, and to provide the model communities with administrative, financial and technical assistance for fostering the base of self-governance. The ministry tried to develop the self-governing system of fisheries through solving the problems that were brought about after they enforced the model project, and to spread the improved system all over the country since 2003. Therefore, the government invested 5.1 billion won in 2002, 175 billion won for the projects (Ministry of Maritime Affairs & Fisheries, 2001).

In this context, this paper aims at correctly evaluating the effects of the model project of the self-governing coastal fisheries which Korean Ministry of Maritime Affairs & Fisheries has enforced, at finding the influential factors to the effects, and at suggesting the policy recommendation for improvement of self-governing fisheries.

II. The Characteristics of Self-governing Fisheries and the Policy Effects of Model Project

1. The Characteristics of Self-governing Fisheries

Coastal fisheries use the same fishing ground. The quantity which every fisher withdraws results in subtraction of total quantity of fish, and it is very difficult to exclude the fishers to withdraw in the fishing ground. In this regard, the coastal fisheries are one of the common pool resources. Common pool resource is natural or man-made resource in which exclusion is difficult and resource yield is subtractable (Hackett, 1992: 325). The Inexcludability of fishers from using fishing ground and the subtractability of available amounts of fish result in high level of interdependency among fishers. This interdependency causes problematic situations of common pool resource dilemma (Gardner, Ostrom, and Walker, 1990). Due to those characteristics of the CPR, it is difficult to manage efficiently the common pool resource (Hardin, 1968).

This nature of fisheries as common pool resources (CPRs) can easily devastate the fishing ground if there are no rules to regulate fishers' activities. It is common that they make rules to regulate their activities in order to increase their amounts to harvest. Those kinds of rules are in place at all communities which have to preserve their common fishing resources.

Ostrom (1990: 90) reviewed 14 cases of CPRs in the world which have been successfully managed for long time. She identified a set of necessary design principles for the success of these institutions in sustaining the CPRs and gaining the compliance of generation after generation of appropriators to the rules in use.

One of important findings that emerge from the previous case study to establish is that productivity-enhancing CPR governance is difficult when appropriators have heterogeneous objectives. Therefore, the collective-choice problem should be considered in terms of two points. First, appropriators must agree on a reduced overall level of appropriation intensity and fashion a set of rules for allocating appropriations rights consistent with the overall reduction. Second, appropriators attempt to implement governance by investing in monitoring and enforcement (Hackett, 1992: 326). Ostrom found that sizable resources were invested in monitoring activities in various cases, and the appropriators themselves played a major role in monitoring each other's activities (Ostrom, 1990: 59).

If CPR governance is not successfully implemented, non-cooperative appropriation is assumed to occur. Those shared gains from CPR governance may have incentive to invest in its success. On the other hand, any appropriators made worse off one another since their non-cooperative payoffs have an incentive to cheat on their allocated

appropriation right, or to legally challenge the governance structure (Hackett, 1992: 326). Thus, it is very important for the appropriators of the same resources to believe that cooperative appropriation will improve resource share, and keep the rules of the community. It is not easy for the appropriators to do in the early days of self-governing. Therefore, it requires that the leaders of the community persuade the appropriators, and members of the community believe it and keep the rules.

2. Influencing Factors of the Effect of Model Project of Self-governing Coastal Fisheries

The effect of model project of self-governing fisheries is not influenced only by the project itself but also by many other factors. Therefore, it is necessary that we fully understand the influencing factors of the effect of model project of self-governing fisheries in order to accurately evaluate the effects. It is institutional framework to suggest good ideas to us when we aim to find the influencing factors of the effects. By the framework, the effect could be influenced by the attributes of community, a set of rules as institutional arrangements, and material/physical conditions.

Attribute of Community: Singleton and Taylor (1992: 315) define community as a set of people (i) with some share beliefs, including normative beliefs, and preferences,

beyond those constituting their collective action problem, (ii) with a more-or-less stable set of members, (iii) who expect to continue interacting with one another for some time, and (iv) whose relations are direct and multiplex.

Ostrom asserts that a group of individuals who share the above four attributes identified by Singleton and Taylor can more easily develop social capital of considerable value to help them address problems of mutual vulnerability. Individuals with share similar beliefs are more likely to be able to communicate effectively about the problems they face. If the group is stable, can communicate directly, and will interact over a long period of time, the likelihood that the group will find solutions to many of the problems they face is indeed higher than for those groups lacking these characteristics (Ostrom, 1992: 343-344). She also asserts that community is important, but not sufficient for the solution of CPRs problems. This is because when the government may intervene and take over the governance and management of local CPRs, community is not necessary for the solution of CPRs problems. But if community is built up, it is necessary. She argues that neither community nor enforcers are sufficient. Both are needed, and both can enhance the other (Ostrom, 1992: 344-351). In the case of self-governing fisheries, a fraternity of fishing village is a representative community in South Korea (Kim, 1998). In recent, a study on problem

solving of commons dilemma through self-governing focused on a fraternity of Korean fishing village (Choi, Lee, and Bae, 2001).

It is very important in using CPRs or collective goods that people in village are familiar and get along with each other. If they know well one another, they can easily predict other's actions with relation to the use and the contribution of those resources (Olson, 1965). An important fact found in the case studies of CPRs is that it is difficult to govern the CPRs when users are heterogeneous. The sources of heterogeneity are diverse, and include differences in the opportunity cost, appropriation skill, caste, language, ethnicity, initial wealth, political influence, technology and physical location (Hackett, 1992: 326).

In using CPRs, it is also very important for the members of a community to participate in cooperative activities. The positive leader can make the members to participate in the cooperative activities and persuade them to keep the rules. Thus she or he can bring about good performance of the self-governing fisheries (Hoy and Miskel, 1996).

The Relevance and Validity of Community's Rule: It is a set of rules that is considered as most important in Institutional Analysis & Development (IAD) Framework.

Those institutions compose individual or group incentive structure, and escape or resolve their conflicts (Choi, 2000).

Ostrom classifies the rules as boundary rule, scope rule, position rule, authority rule, aggregation rule, information rule, pay-off rule in IAD Framework (Ostrom, 1992: 19). Especially, among those rules, Payoff rule which defines distribution of benefit and cost is important. If anyone becomes one of the community members, she or he has much concern with the rules which define how to distribute the fishing resources harvested, and how to distribute the cost which is necessary for resource management, production management, and fishing ground management.

How much these rules are relevant and valid, and are consistent with community conditions would influence the community members to keep the rules, and to participate in cooperative activities. How much the opinions of all the members are reflected in the process of making these rules and how much democratically the rules are made would affect the community members to keep the rules. Keeping the rules and participating in cooperative activities influence the performance of the community.

Physical/Material Conditions of Fishing Ground: Even though both the communities and their rules are well made up, that the quantities of their harvest are different is due to the different physical conditions of their fishing grounds. The temperature of fishing

ground influences the kind of fish and their growth (Sutherland, 1986: 36). If the temperature suddenly goes up, and the fishing ground is contaminated by influx of wasted water or oil, the fishing resource is devastated. Each fishing ground has different depth of water, different temperature, and different drift of a current. These differences make the fishing ground different, and make the fishers to withdraw different fishing resource. Even though the fishing ground had been devastated because of the so-called commons tragedy, the fishing ground which had had once good natural and geographical conditions in the past would result in good performance in coastal fisheries.

III. Research Design and Analytic Framework

The model project of self-governing fisheries was enforced at the 57 communities in 2001, 79 communities in 2002, 175 communities in 2004. It takes some time to bring about the effects. Some communities show great positive effects, and others do little effects. The model project could not be compulsorily enforced to the communities. Therefore, the objects of the model project were selected among the ones which had proposed voluntarily to participate in the project. In this case, there will be some problem of internal validity in the study because of the selection effects.

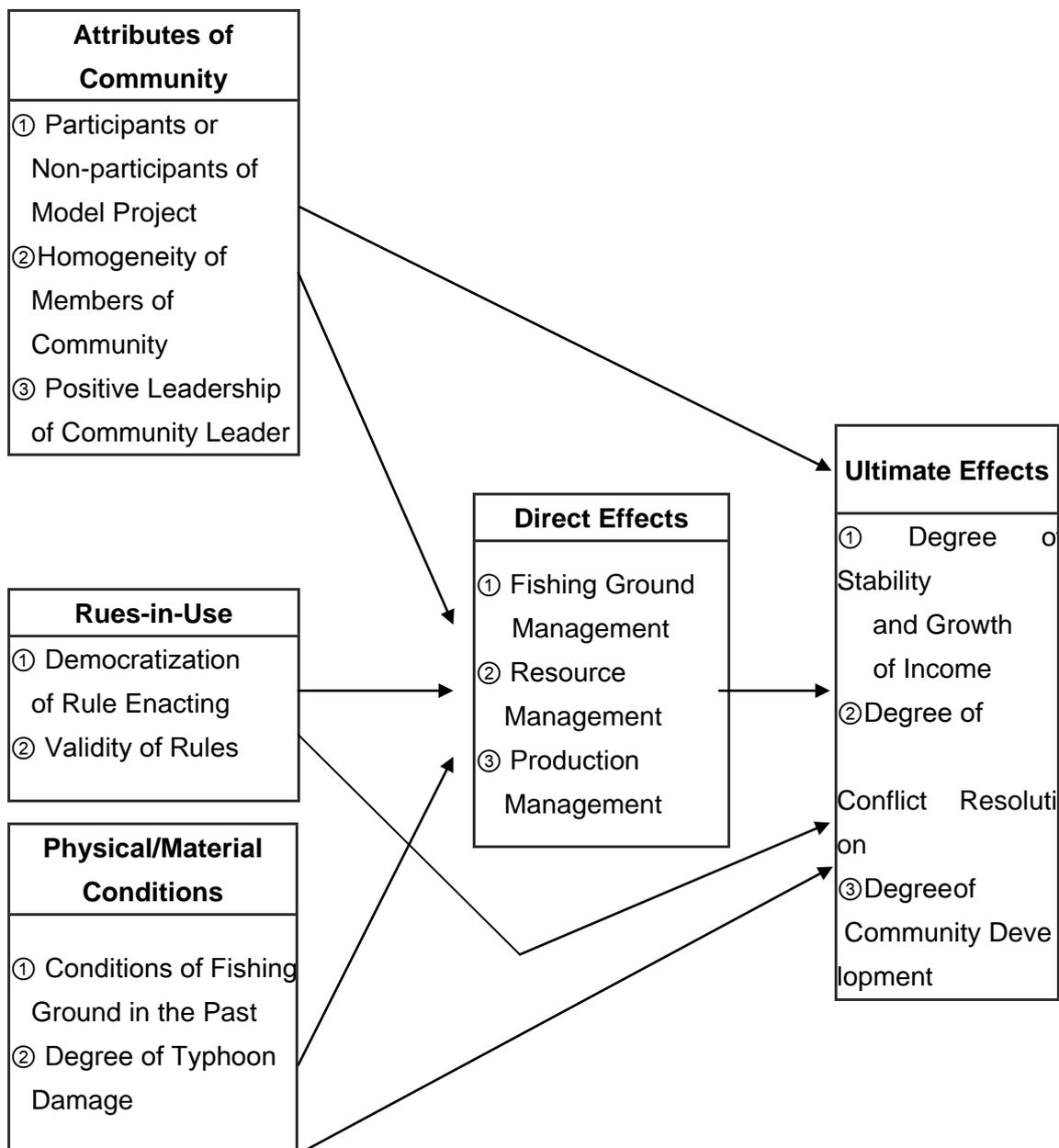
In order to solve the above problem, this paper tries to use non-experimental research design with statistical method. For this purpose, regression analysis may be more helpful in order to compare the effects of two groups with controlling of the variables which could influence the performance of fisheries. In order to use this method, we have to know influencing variables on the effects of self-governing fisheries.

This paper tries to evaluate the effects of model project of self-governing fisheries. Survey research was carried on 79 communities which the model project of self-governing fisheries was enforced to in 2002, and 79 similar non-participant communities which are located in the same jurisdiction of local government. The effects could be measured by the ton of fish or sea-weed harvested. But, the kind of fisheries resources is various, and it is very difficult to measure. Therefore, this paper uses the relative evaluation by survey of community chairmen.

Considering on the above theoretical review, we can make a model including policy variables and controlling variables. The management activities and the outcomes of coastal fisheries are influenced by attributes of community, and physical/material conditions as well as participating in the model project.

The model can be briefly described as follows.

<Figure 1> Analytical Model of the Effects of Model Project of Self-governing Fisheries



In the above model, besides the policy variable, whether or not participating in the model project, the attribute of community and physical/material conditions influence the

direct effects of model project, that is participation in the management activities, and in the ultimate effects. The focus of the model is whether policy variable influences the management activities and the outcomes of fisheries or not.

Attributes of community are socio-economic conditions of the communities. Homogeneity of members of community, positive leadership of community leader, average age of community members, and percentage of participants of self-governing fisheries in the community would influence the activities of the management, and outcomes of the fisheries. Physical/material conditions including various characteristics, such as type of fisheries, natural conditions of fishing ground in the past, location of community, and degree of typhoon damage may also influence the management activities and in the end the outcomes of the coastal fisheries.

Direct effects of the model project mean the change of outcomes in terms of the objectives which the project is to bring about within a short period in the community members through enforcing the project. Therefore, the model project tries to make the community members to participate in various activities or to abstain themselves from harvesting for preserving the resources. The direct effects are fishing ground management, resource management, and production management. The ultimate effects of the project refer to the change of outcomes in terms of objectives which the

project is to bring about in the end in the community through enforcing the project. Therefore, stable increase of income, degree of conflict resolution, and community development.

It is also important to find under what condition the model project brings about high performance. Institutional framework insights us that it is important to make good institutions in order to high performance. Therefore, it necessary to ascertain whether the variable of the characteristics of rules influences the management activities and outcomes of coastal fisheries with control the variables, that is physical/material conditions, attributes of community, in the regression analysis. In this analysis, we have to review only the participating communities.

The variables used in the model and their measures, and reliability test scores can be synthesized as follows.

<Table 1> Variable Index of Effect Evaluation of Model Project of Self Governing Fisheries

Factor	Variables	Measures	Reliability Coefficient
Attributes of Community	Participants of Model Project		Dummy
	Homogeneity of Members of Community	*Degree of Mutual Acknowledgement *Degree of Familiarity	.8096
	Positive Leadership of Community Leader	*Degree of Positive Participation, *Degree of Commitment to	.7843

			Community Work	
Physical/ Material Conditions	Conditions of Fishing Grounds in the Past		*Degree of Ecological Conditions of Fishing Ground in the Past	.7634
			*Degree of Geographical Conditions of Fishing Ground in the Past	
	Typhoon Damage			Dummy
Characteristics of Rules	Democratization of Rule Enacting		*Degree of Reflecting Members' Opinion *Degree of Consensus Building	.1836
	Validity of Rules		*Congruence of Regional Condition *Relevance of Penalty Rule *Relevance of Right and Duty Rule *Relevance of Member Qualification Rule *Relevance of Fishing Ground and Resource Management Rule	.5087
Effects	Direct Effects	Degree of Fishing Ground Management	*Expellant Activities *Fishing Ground Cleaning *Cleaning of Surroundings of Fishing Ground *Restoration of Spawning Ground and Inhabitants	.8154
		Degree of Resource Management	*Discharging of Fishing Resources *Keeping of Not Permitting Period of Withdrawal *Keeping the Length Standard of Fish	.7047
	Ultimate Effects	Degree of Production Management	*Enforcing One Year Production Plan *Keeping the Limit of Working Days *Keeping the Limit of Working Times *Installation & Operation of Common Facilities	.8487
		Degree of Stability and Growth of Income	*Growth of Income *Stability of Income	.8527
		Degree of Conflict Resolution	*Improvement of Relationship between Officials and Fishers *Resolution of Fisheries Conflict	.7499
		Degree of Community Development	*Activation of Community Function *Self-governing of Fishing Ground	.7719

		*Development of Fishing Village	
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Since most of reliability coefficients are over .7000 in <Table 1>, there is no problem of reliability. But, the coefficient of the democratization of rule enacting is very low, and that of validity of the rules is also a little low. It means that the measures are not homogeneous. Therefore, we use the measures of the variables as an individual variable. In this case, it may raise reliability problem of variables.

IV. Effect Analysis of Model Project of Self-governing Coastal Fisheries

1. Direct Effects of Model Project of Self-governing Fisheries

By the way, it is difficult to know whether the difference is due to the model project or the other third factor. So, it is necessary to analyze the effects of model project on the management and the effects of community characteristics as control variables on the management at the same time. The result of the analysis is shown in <Table 2>.

<Table 2> Direct Effects Regressed On Model Project of Self-governing Fisheries

Dependent Var. Independent	Fishing Ground Management		Resource Management		Production Management		Management Effect	
	B	B	β	B	β	B	β	B

Var.								
(Constant)		1.102		1.693		.939		1.146
Participants of Model Project	.394***	.709	.368***	.756	.465***	.851	.456***	.726
Homogeneity of Community	.243*	.309	.218	.301	.151	.199	.244*	.268
Positive Leadership of Community Leader	.195	.315	.141	.242	.283**	.417	.254**	.357
Degree of Typhoon Damage	-.003	-.002	-.124	-.097	.011	.016	-.064	-.040
Conditions of Fishing Grounds in the Past	-.090	-.083	-.064	-.063	-.063	-.059	-.079	-.060
Adjusted R ²	.319		.296		.408		.462	
Significance	.000		.000		.000		.000	

In the above table, 31.9% of the variance in fishing ground management is explained by the independent variables, such as participants of the model project, homogeneity of community, positive leadership of community, degree of typhoon damage, and conditions of fishing grounds in the past ($R^2=.319$). Because the fishing ground management of the community participating in the model project is better than that of non-participants of the project controlling variables of community characteristics in regression analysis, we can conclude that the policy effect is evident. Besides,

homogeneity of community also brings about immediate policy effects, that is, managements of coastal fisheries.

In <table 2>, the second regression model accounts for 29.6% of the variance in resource management of fishing community ($R^2=.296$). The policy variable is only significant in the model, that is, participants of the model project.

The third regression model accounts for 40.8% of the variance in production management of fishing community ($R^2=.408$). In the model, participants of the model project, and positive leadership of community are significant variables which influence on the production management.

The fourth regression model accounts for 46.2% of the variance in total management activities including fishing ground management, resource management, and production management. The participants of the model project, and positive leadership of community significantly influence the total management at the level of 5%. The typhoon damage in 2003 year and the past conditions of the fishing grounds do not influence significantly on total management as immediate effect of model project.

2. Ultimate Effects of Model Project and Community Characteristics

The ultimate effects of model project could be influenced by the community characteristics as well as by the model project. Therefore, we can find pure effects of the model project with regression analysis including independent variables, such as community characteristics and whether or not the participants of the model project to explain the ultimate effects. The result of analysis is as following <Table 3>.

<Table 3> Model Project's Effects Regressed On Community Characteristics

Dependent Var. Independent Var.	Stability and Growth of Income		Prevention and Resolution of Conflict		Community Development		Ultimate Effects	
	β	B	β	B	β	B	β	B
Participants of Model Project#1	.502***	1.079	.266*	.475	.420***	.713	.456***	.726
Homogeneity of Community	.209*	.320	.152	.188	.337**	.407	.244*	.268
Positive Leadership of Community Leader	.186	.353	.291*	.436	.081	.122	.254*	.357
Typhoon Damage#1	.040	.034	.025	.016	.041	.028	-.064	-.040
Conditions of Fishing Grounds in the Past	.079	.086	.091	.081	.060	.051	-.071	-.059
Adjusted R ²	.433		.211		.386		.462	
Significance	.000		.000		.000		.000	

#1: Dummy Variable

In <Table 3>, the stable increase of income is statistically influenced by the enforcement of model project of self-governing fisheries with controlling the variables of homogeneity of community, positive leadership (prob. value <.001). Therefore, we can conclude that model project brings about the policy effects of the stable increase of

income. In the model, independent variables account for 43.3% of the variance in the stable increase of income. The homogeneity of community statistically significantly influences the stable increase of community members' income, but the positive leadership, the typhoon damage in 2003 year, and the past conditions of the fishing grounds does not influence the stable increase of community members' income.

Conflict prevention and resolution is statistically significantly influenced by the variable of enforcement of model project with controlling independent variables of community characteristics (prob. value $<.05$). Therefore, we can conclude that model project is conducive to the conflict prevention and resolution. And the independent variables account for 21.1% of variance in the conflict prevention and resolution. Positive leadership of community leader influences conflict prevention and resolution, but homogeneity of community, the positive leadership, the typhoon damage in 2003 year, and the past conditions of the fishing grounds do not. The model project accounts for 43.3% of variance in the stable increase of incomes, but it does 21.1% of variance in conflict prevention and resolution. It is due to the fact that conflict occurs among the members of community. However, it happens between the members and non-participants of the model project, and between the members of community and illegal fishers of other area who work at nationwide fishing ground.

The community development is statistically significantly influenced by the enforcement of model project with controlling variables of community characteristics (prob. value $<.001$). Therefore, we can conclude the model project brings about the community development. The independent variables account for 38.6% of variance in community development. Homogeneity of community statistically significantly influences community development, the positive leadership of community leader, the typhoon damage in 2003, and the past conditions of the fishing grounds do not.

Ultimate effects including the stable increase of community members' incomes, the conflict prevention and resolution, community development are statistically significantly influenced by the enforcement of model project with controlling variables of community characteristics ($p<.001$).¹ Homogeneity of community, the positive leadership of community leader statistically significantly influences ultimate effects, but the typhoon damage in 2003 year, and the past conditions of the fishing grounds do not.

3. The Analysis of the Effects of the Model Project

¹ Those ultimate effects can be realized by the management activities, such as of fishing ground management, resource management, and production management which the model project tries to achieve as direct goals (Kim, 2004).

The result of regression analysis of the effects of the model project with community characteristics, and rules characteristics as independent variables is summarized in

<Table 4>.

<Table 4> Regression Analysis of Influencing Factors on the Effects of the Model Project

Dependent Var. / Independent Var.	Fishing Ground Management		Resource Management		Production Management		Management		Stable Increase of Income		Prevention and Resolution of Conflict		Community Development		Ultimate Effects	
	β	B	β	B	β	B	β	B	B	B	β	B	β	B	β	B
Constant	*	2.121	*	2.550		.497		1.737		.369		.125		.850		-.649
Relevance of Fishing Ground and Resource Management Rule	.456**	.340	.025	.018	.137	.141	.237	.169	.274	.257	.350*	.335	.006	-.003	.351*	.306
Relevance of Member Qualification Rule	-.199	-.125	-.255	-.163	.054	.046	-.136	-.081	.147	.114	-.086	-.062	-.041	-.028	.050	.034
Homogeneity of Members of Community	.614***	.621	.477*	.487	.472*	.656	.610**	.586	.324	.434	.482*	.617	.656***	.722	.400*	.465
Congruence of Regional Condition	.228	.148	.219	.145	.205	.183	.256	.158	.183	.148	.225	.185	.281	.199	.376*	.337
Relevance of Penalty Rule	.281	.167	.399*	.238	-.003	-.002	.237	.134	.273	.210	.294	.213	.293*	.189	.345*	.232
Conditions of Fishing Grounds in the	-.149	-.087	.071	.042	-.110	-.088	-.079	-.044	.194	.133	-.046	-.034	.067	.042	.136	.091

Past																
Positive Leadership of Community Leader	-.439*	-.473	-.203	-.222	-.188	-.279	-.318	-.326	-.230	-.031	-.211	-.279	.222	.260	.211	.251
Reflecting Members' Opinion	-.111	-.066	-.115	-.069	.263	.214	.045	.025	-.106	-.075	-.037	-.029	-.064	-.041	-.118	-.085
Adjusted R ²	.441		.249		.130		.322		.157		.425		.427		.464	
Significance	.001		.029		.143		.010		.118		.003		.001		.004	

*p<.05, **p<0.01, ***p<0.001

In <Table 4>, fishing ground management is statistically significantly influenced by the variables of homogeneity of community ($\beta=.614$), relevance of fishing ground and resource management rules ($\beta=.456$), and positive leadership of community leader ($\beta=-.439$). The community whose members know more each other is, the community whose the rules are more relevant, and the community whose leader is more positive have more effects of the model project. The model accounts for the 44.1% of the variance in fishing ground management ($p=.001$).

The effect of resource management is significantly influenced by the homogeneity of community ($\beta=.477$) and relevance of sanction ($\beta=.399$). The model accounts for the 24.9% of the variance in the effect. The model explaining the effect of production management is not significant ($p=.143$). The effect of total management is influenced

by the only homogeneity of the community ($\beta=.610$), and the model accounts for the 32.2% of the variance in the effect.

The model explaining the effect of stable increase of income is not significant ($p=.118$). The effect of conflict prevention and resolution is well explained by the homogeneity ($\beta=.482$) and relevance of fishing ground management ($\beta=.472$), 42.5% of the variance in the effect is accounted by the model. The effect of community development is explained by the homogeneity ($\beta=.656$) and relevance of sanction ($\beta=.293$), 42.7% of the variance in the effect is accounted by the model. Finally, the comprehensive ultimate effect is influenced by the goal the homogeneity ($\beta=.400$), congruence of regional conditions ($\beta=.376$), relevance of penalty rule ($\beta=.345$), and relevance of the fishing resource ($\beta=.351$). The model accounts for 46.4% of the variance in the ultimate effect, and is statistically significant ($p=.004$). This result hints us that the rule itself and the process of the rule enacting are very important in the management of common pool resources.

Synthesizing the above result of the analysis, the most important factor for the community members to participate in fishing ground management, resource management, and production management is homogeneity of the community. The most important factor in bringing about the ultimate effect of self-governing fisheries

including the stable increase of income, conflict prevention and resolution, and community development is also homogeneity of community. This is partly caused from Confucian culture which considers personal relationship as very important, and it is also caused from fact that trust is one of important social capitals as Fukuyama indicated. Therefore, mutual trust is important in solving common pool resource problems as well as in community life. Besides, the rules and rule enacting process are also important in order to make the community members to participate positively in the management activities.

V. Discussion and Implications

Common pool resource like coastal fisheries is apt to raise the conflict with appropriation of the resource among fishers, and to become easily devastated without great efforts of preservation. This paper tries to analyze the effects of the model project of self-governing fisheries which was enforced to solve those problems. The discussion and implications of this study are as follows.

First, considering the background of enforcement of model project of self-governing fisheries, we can find devastation and depletion of fishing resources, and serious conflicts among fishers, and between fisheries and public officials in charge. In

the process of research, we could easily notice those conflicts and resource depletion in Korean coastal fisheries as many scholars found the same phenomena (Gardner, Ostrom, and Walker, 1990). In the case of the fishing community which has been selected as a successful one, the community members have recognized the seriousness of the depletion of fishing resource from excessive harvest and conflicts among fishers. The leaders of the community try to solve those problems with enforcement of the model project, and to persuade the members of the community to positively participate in the project. As Hackett (1992: 326) asserted, if fishers thought that fishing governance would not be successfully implemented, non-cooperative appropriation would be assumed to happen.

Second, the enforcement of the model project results in the ultimate effects including the stable increase of income, prevention and resolution, and community development. The effects can be realized through positive participating in the management activities including fishing ground management, resource management, and production management which the model project tries to achieve as immediate goals. In this context, various management activities are very important in bringing about the successful management of CPRs.

Third, the most important factor in bringing about the effects of the model project of self-governing fisheries is the homogeneity of community. That is, the more community members know, become intimate with, and trust one another, the more they participate in the management activities, and ultimately the more they bring about a stable increase of income, prevention and resolution of conflict, and community development. These findings support Hackett's assertion that heterogeneity complicated efficient governance structures (Hackett, 1992: 325). From this study result, we can find that it is important to foster community for successful enforcement of model project of self-governing fisheries. As Fukuyama (1995) indicates, it is important to make community members to trust in and to be familiar with one another in fostering fishing community as well as community development. Even though the fostering of community could not be made within short time, government has to concern with it.

Fourth, when community members do not keep the rules, how much relevant the penalty rules are is important in bringing about the ultimate effects. If the rule is too strong or too weak, it is difficult to bring about the effects of penalty. Therefore, when they make rules of community, they should make relevant penalty rules.

Fifth, the various fishing management activities including fishing ground management, resource management, and production management are important in

bringing about the ultimate effects of model project. It is easily expected result. The direct objective of the model project was to foster management of self-governing fisheries. Therefore, we can conclude that the direct object is relevant for achieving the ultimate goals.

Sixth, the rules and rule enacting process are also important in order to make the community members to participate positively in the management activities, and finally to yield the good effects from the model project. This finding supports the Ostrom's design principles for the success of the institutions in sustaining the CPRs (Ostrom, 1990: 90).

Seventh, even though they call the project as a project of self-governing fisheries, it is not really self-governing. Government directly and deeply involved in the project. Therefore, government decided to support the project indirectly with establishment of National Association of Self-governing Fishers. However, even though the model project of self-governing fisheries results in a great success, it doubts whether the project could bring about great effects if it would be enforced in nationwide area. That is, there may be external validity problem (Cook & Campbell, 1979: 70).

Finally, the prevention and resolution of conflicts is not well explained as compared to other ultimate effects of project. Besides, in the communities where the

project has been successfully enforced, plenty of conflicts among fishers', and between fishers and officials in charge still have been existed. They have partly caused from collective choice rule, that is, law of fisheries which permits fine net fisheries, fish trap fisheries, and so forth to harvest in national wide sea area. Many fishers assert that the law should be revised gradually with abolition of those fishing rights, and at the same time with relevant compensation to the fishers.

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