Policy and Rule Configuration: Korean Rural Development Movement Saemaul Undong

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CONTENTS

I. INTRODUCTION

The problem of collective action has been discussed by Political Scientists, Economists, sociologists and psychologists for almost 30 years. Since Olson (1965), it has been taken for granted that there is a clear disincentive for the potential beneficiaries to contribute the time, money or other resources necessary for the group effort to be successful, even if all want that effort to be successful. Because they cannot be excluded from being enjoying the results of collective action. This is social dilemma (Dawes 1980; Messick and Brewer 1983; Hardin 1971; Sell 1988; Sell and Wilson 1989). One-shot PD game captures this dilemma situation of public good provision: free-riding problem.[1]

Contemporary game theory, however, indicates that iteration, even finite iteration, and retaliatory strategies are expected to resolve "social dilemmas" (Taylor 1987; Friedman 1986; Raub 1988; Bianco and Bates 1990; Kreps, Milgrom and Wilson 1982). That is, the trigger or TFT strategies - both effective (in the sense that a player cannot improve the payoff by deviating from cooperation, given that this deviation "triggers" punishment) and credible (in the sense that the players are willing to carry out their threatened punishment if any one defects) - must be subgame-perfect to sustain cooperation in an iterated game, if discount parameter is large enough in relation to the temptation to

[1] Social dilemma situations are also explained by other games such as a Assurance Game (Runge 1984), a Chicken Game (Taylor 1987), and Volunteers' Dilemma Game (Diekmann 1985).

defect.[2] But, this formal theory still have some problem. As Folk theorem shows, cooperation is only one of the infinite number of equilibrium, and more important, full defection is a sub-game perfect equilibrium regardless of the discount rate and the temptation to defect (Bianco and Bates 1990; Axelrod 1981). In other words, it can be proven that no one have an incentive to deviate at some points (equilibria), but we cannot tell how an equilibrium point is actually selected from several equilibria. In this respect, we can say that the problem of providing public goods by securing cooperation is one of getting to cooperation in the first place.

In the real world, we have seen many cases where public goods are provided voluntarily by long-enduring, self-organized and self-governed collective action (Ostrom 1990). Korean rural development movement in 1970's, called Saemaul Undong (means New Village Movement), may be thought of as one of these cases. Many studies empirically show that Korean farmers <u>did</u> contribute, both actively and voluntarily, to the provision of public goods, especially infrastructure (Park 1979; Kim 1985; Whang 1981; Uphoff 1980; Steinberg 1984). Their cooperation was successful in 1970's, but not so successful in 1980's. In this paper, I

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[2] In formal term;
$\alpha_i \geq \alpha_i^* = \{P_i(S_{-1}^+) - U_i(S^+)\}/\{P_i(S_{-1}^+) - U_i(S^-)\}$
, where α_i=discount parameter
α_i^*=temptation to defect
$P_i(S_{-1}^+)$=i's payoff when he defects and others all cooperate
$U_i(S^+)$=payoff of mutual and universal cooperation
$U_i(S^-)$=payoff of mutual and universal defection (Raub 1988).

will see what makes collective actions among Korean farmers to be initiated and sustained in 1970's, and what makes them unsuccessful in 1980's. Especially, I will focus on the rule configuration of Saemaul Undong and government's affects on it.

II.SAEMAUL UNDONG

1. Background:

Korea's rural sector had suffered from official neglect prior to the 1970's. Officials had little enthusiasm for program promoting agricultural innovation, and market arrangement generally worked to the farmers' disadvantage. The government's emphasis was on urban policies. As a result,

> agriculture had rarely been very profitable; at times it has barely reached even subsistence levels ... low prices of agricultural products [were] compared poorly with the prices of manufactured goods the farmers purchased ... the lack of rural roads complicated nearly every farm chore and discharged the farmers from using agricultural machinery (Kim 1985, 324).

In the early 1970's executive attention turned to the imbalance between urban and rural Korea (KOIS 1977; Park 1979). President Chung-Hee Park, "son of the poor farmer" in his own expression, believed that spontaneous self-help efforts could produce striking transformation in the quality of rural life, and proposed a strategy: rural development through cooperative village self-reliance (KIOS 1977; Park 1979; Kim 1985).[3] That

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[3] Some scholars argue that the basic motive was political one. According to them, the ruling party led by him was based on the popular vote of rural farmers, while the opposition party was based on the support of the urban sector. In 1970, he needed more solid

was the Saemaul Undong. The essence of it was to promote cooperative development efforts by villagers, guided by competent and highly motivated village leaders (called Saemaul leader) with government aid through technical and financial assistance and the training of the Saemaul leaders.

2. Historical Overview:

(1) 1971-74: This was the period of (i) building Saemaul institutional arrangements within government organizations and at local level; and (ii) the Saemaul experiment (Rondinelli 1983). Saemaul Undong Consultive Council was established and organizations patterned after it were set up at each level of local administration: Province (do), County (kun), township (myon), and Village (maul).[4] National government offered all villages a limited amount of building materials with which to launch small self-help projects such as common well and roads. Of 35,000 villages, one-third of them responded positively (Rondinelli 1983). It made government to recognize that rural development cannot be achieved simply by the maximum influx of resources into rural communities without the proper response or

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supports from rural sector, and the Saemaul Undong was one of ways of doing that job (see Whang 1981, ch.4).

[4] At that time, there already existed one institution for rural development called National Agricultural Cooperative Federation (NACF). But, unlike its name, it was nothing more than a government agency from which the poor could not receive good services. It had nothing to do with the success of Saemaul Undong, and it was "nothing more than the agent for the fertilizer company" (Chang 1987).

broadly based community initiative of rural people (Whang 1981). On the basis of this experience, Saemaul Undong has since focused on encouragement of village initiatives and concentrated its supports on those villages that display the will and the competence to carry out development project in accordance with the program's ideals of self-reliance and cooperation. Notice that, in this period, a system for village classification which decide the level of government support (it will be explained in ch.3) and Saemaul Leaders Training Institute were established.

(2) 1974-76: This stage aimed at improving rural living standards and rural infrastructures -houses, roads, drainage, mountain woodlands, electrification and running water supply (Park 1979; Kim 1985). More important, village-level informal organizations, including Women's Leagues and Youth Clubs, were recognized and encouraged by the government. It was believed that informal ties between villagers were critical in sustaining cooperative efforts (Yu et al. 1980).

(3) 1977-79: This stage had been concerned with reinforcing self-help incentives other than government's supports. By 1977, Korea achieved self-sufficiency in food and the gap between rural and urban sectors were reduced, and agricultural policy began to be changed, according to these success of Saemaul Undong. Unassisted, spontaneous development efforts were emphasized. Villages were encouraged to accumulate capital by designing and managing project independently. Further, the government allowed the import of agricultural products and started to freeze

government purchase prices of major grains (Kim 1988). Given the fact that the cost of producing rice, wheat, corn, or soybeans in Korea range from two to five times that in the United States (Steinberg 1984, D-19), Korean farmers cannot compete with imported agricultural products. Moreover, considering annual inflation rate, freezing government purchase price means actual decrease in prices of major agricultural products, in turn, the substantial decrease in farmers' income.

(4) From 1980 onward: After change in Administration in 1980, Korean new President, Doo-Whan Chun, proclaimed that Saemaul Undong should be revitalized (Republic of Korea, 1984). Under the flag of civil stewardship and revitalization of Saemaul Undong, as a result, Saemaul Undong Central Consultive Council was changed to Headquarter of Saemaul Undong. The total amount of budget of it was almost doubled compared to Park Administration, and the total capital which was publicly known was almost US $ 70 million by the end of 1985 (Kim 1988). It was called even "the 4th Branch of the Government" or "the untouchable". But, it failed to revitalize the Saemaul Undong. More precisely, it turned out that it was used politically.[5] After the change of Administration, the president of the Headquarter of Saemaul Undong, the younger brother of ex-President Chun, was sentenced to imprisonment for corruption and

[5] It is publicly known that the Headquarter of Saemaul Undong forced big companies to donate political fund called "Saemaul Donation". Under the name of civil stewardship, it could receive government support without being under the control of formal audit process.

misuse of power (Yoon 1987).

Now, Korean farmers suffer from extreme poverty. The ratio of income from farming to cost of living, which used to be 120% in the middle of 1970's and 90% in 1980, is below 70% (Kim 1987). Considering the absence of alternative employment opportunity in the rural community (Kim 1985; Chung 1987; Ko, Lim and Joo 1979), it means that most Korean farmers have debts (Kim 1986). In 1988, the national total of Korean farmers' debt was about US $ 5.7 billion, and it was 35% of the national total of the farmers' income (Kim 1988).

In the following chapters, I will examine the causes of the success and failure of Saemaul Undong, the rule configuration and its relationship to the success and failure, in game theoretic term.

III. SAEMAUL UNDONG AS A GAME

1. Saemaul Undong as a Repeated Game:

Saemaul Undong can be thought of as a game. Participation in the Saemaul Undong was totally based on volition. Rural villagers' participation was the result of their strategic choice. There was no legal basis by which rural villagers could be enforced (Whang 1981). Further, Saemaul Undong can be regarded as a repeated game, on the basis of the facts that (i) most Saemaul projects have required more than 1 round of cooperation in achieving the goal of the projects; and (ii) a great number of projects are required to achieve the ultimate

goal of the Saemaul movement: eventual reduction of rural poverty and employment as well as the improvement in income and standard of living in rural life. Based on this assumption, I will build a model with which we might explain the success and failure of Saemaul Undong. The model is like the following:

Let one day cooperation be C_{itT} ,

Then, Saemaul Undong = $\Sigma_{i=1}^{Nv}\Sigma_{t=1}^{NT}\Sigma_{T=1}^{\infty}C_{itT}$

,where N_v = population of village
N_T = number of round of cooperations required for the completion of project T
i = individual farmer
t = round
T = project.

In the rest of this chapter, I will examine rules-in-use and government's influence on them.

2. Rules-in-use:

A set of working rules can be defined as institutions:

> [Which] are used to determine who is eligible to make decision in some arena, what actions are allowed or constrained, what aggregation rules will be used, what procedures must be followed, what information must or must not be provided, and what payoffs will be assigned to individual dependent on their actions (Ostrom 1990, 76; 1986).

These rules, then, influences the actions of individuals and outcomes of the game. Furthermore, these working rules are affected by the choices made within a set of collective choice rules that are themselves made within a set of constitutional choice rules (Ostrom 1990, 76). In addition, physical world, as well as the attribute of community where the game is played, also

either directly or indirectly affect the action situation. Finding out all these factors mentioned above, I think we can explain both success and failure of Saemaul movement.

(1) Position rule: It specifies a set of positions and how many participants are to hold each position. We can think of several positions such as Saemaul leaders, members of Village Development Committee, Village General Meeting and informal village organization (Kim 1985; Rho 1977; Park 1974). There were two Saemaul leaders in each village (one is male and the other is female). Village Development Committee was generally composed of 15-20 elder and influential villagers. Village General Meeting was composed of the whole villagers. And Informal village organizations were composed of several villagers who shared something common. Government formally recognizes all village level organizations including informal village organizations and, especially, tries to encourage farmers to form as many informal organizations as possible, in order to take use of family and kinship ties in implementing Saemaul Undong (Whang 1983).

(2) Boundary rule: It specifies how the game selects players to hold or leave these positions. Players refer to the farmers who live in rural village and engage in farming. There were about 35,000 villages in Korea in 1970's (Park 1979; KIOS 1977), and villages were composed of 25 to 75 houses (Kim 1985) or about 80 farmers on average (Park 1979). It is the government's policy to narrow the boundary of Saemaul Undong to village (maul) rather than township (myon) - the lowest formal

administration unit (Whang 1981). The underlying reason for this policy is, probably, it is found from the experimental projects that cooperative efforts are likely to be sustained better by the small-scale and informal communities, village, than larger and formal administrative units.

Saemaul leaders must be an inhabitant in the village (Kim 1985). They are chosen by villagers. Anyone over 20 years old, regardless of education, income or social status, who was chosen by his neighbors, could become a Saemaul leader (Rondinelli 1983). But, actually, most Saemaul leaders are older than 40, experienced, influential and highly motivated people in the village (Park 1974). The members of Village Development Committee are usually the seniors of the village respected by the villagers and elected in the Village General Meeting. Any one who lives in the village automatically becomes the member of the Village General Meeting and the informal village organizations (if he/she shares common interests with some organization).

(3) Authority rule: It specifies which set of actions or strategies are assigned to which position at each round of the game. Saemaul leaders are supposed to initiate village development project and promote cooperation among neighbors. But, we must remember that there is no formally prescribed authority for Saemaul leaders, even though the government provides formal training to the Saemaul leaders and publicize the success story of outstanding Saemaul leaders. Unlike Bianco and Bates's leader (1990), they have no control over the distribution

of the benefits of collective actions. They are simply farmers who are willing to serve as a Saemaul leader in spare time.[6] Similarly, Village Development Committee has no formal authority, and it is shown that they contributed almost nothing to the success of Saemaul Undong(Aqua 1974). We can say that the farmers examine possible projects among the government's program package and approve Saemaul leaders proposal for implementing projects and draft a village development plan in the Village General Meeting (Kim 1985). In sum, I think we can say that there is actually two position in the game; Saemaul leaders and the farmers. In game theoretic sense, however, their strategic variables are identical: the level of cooperation. Let these strategies be:

$$s = \{ s_i \mid s_i \in (D_i, C_i) \}.$$[7]

, where C_i = level of cooperation of i which is regarded as full cooperation by the neighbors

D_i = level of cooperation of i which is regarded as full defection by the neighbors

And let the super-game strategies of two Saemaul leaders and farmers be unconditional cooperation and conditional or retaliatory strategy, respectively (or C^{∞} and B_n, in Taylor's terminology). Here, retaliatory strategy means that one will

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[6] Of Saemaul leaders, 85.2% was farmers; 92% had lived in their village since their grand parents' generation; 83.4% said that they do this job because they devoted for their village. Of villagers, about 47% thought that Saemaul leader is a very rewarding job and 30% said that it's worth trying once (Whang 1983).

[7] Here, s_i can be thought of as a combination of contributions of labor, capital, material, and land.

cooperate as long as others cooperate. In addition, I assume that there may be some people who always defect because they share nothing with other villagers. Formally,

$S = (C^{\infty}, C^{\infty}, B_n, \ldots, B_n, D^{\infty}, \ldots D^{\infty})$,[8] and

$B_{nt} = C_i$; if $AO_{t-1} = C^*$

D_i ; if $AO_{t-1} = D^*$

, where B_{nt} = retaliatory strategy at round t
AO_{t-1} = Aggregated outcome at round t-1
$C^* = \Sigma C_j$, $i \neq j$
$D^* = \Sigma D_j$, $i \neq j$
$C_i \neq C_j$ and $D_i \neq D_j$.[9]

(4) Aggregation rule: It specifies the decision function to map actions into intermediate or final outcomes. We can think of several aggregation rules. First, as mentioned before, Saemaul leaders propose village development project. This projects, then, must be approved by the consensus of all villagers. The next round of the game is implementation. In implementation process, villagers can decide their strategies, the level of cooperation, at each round. And, their strategies are conditional on the aggregated outcome of the previous round decided by others' actions. The aggregation used in this process is, I conjecture, summarizes in terms of n which appears in B_n: $n = N - (1+K)$, where $k > 0$. It means that Korean farmers know the

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[8] This is Taylor's notation. For more detail, see Taylor (1987).

[9] It means that farmers know each other so well that they can estimate others ability to contribute. It is due to the characteristics of Korean rural community explained by the pursuit of traditionally common interests, physically close interaction, and cooperative action among villagers.

exact number of those who use B_n, and they will cooperate as long as N - (1+K) people cooperated at the previous round. Formally,

$$AO_t = C \quad ; \text{ if } N_{Bt} > N - (1+K)$$

$$D \quad ; \text{ if } N_{Bt} < N - (1+K).$$

,where N_{Bt} = the number of people who cooperated at round t-1

The meaning of K is "the degree of forgiveness (Bender 1988) or tolerance (Ostrom 1990)". When k = 0, it means that strategy is not "forgiving" or ignores some stochastic error or noise. When K > 0, it means that strategy is "forgiving" to some extent. In other words, villagers regard the deviation of K people as not what they really wanted to do, but the unintended results come form the uncontrollable factors (Bender 1988). Villagers usually understand some personal difficulties of their neighbors such as poverty, illness (Yu et al. 1980; Yu 1980). Unlike Taylor's argument (1989), villagers have no incentive to be in K people group (i.e., an incentive to free-riding). It is probably because (i) extended-family-like attribute of village makes it easy and almost costless to monitor the villagers; and (ii) F-connection between villagers (Ben-Porath 1980) internalize norms of not free-riding. What is noticeable is that the government tries to reinforce informal-ties by recognizing and encouraging informal village organizations in order to affect implementing aggregation rule by influencing K.

Next, at the end of each project, the outcome of collective action is evaluated by the government, based on the village classification system (KIOS 1977; Rondinelli 1983; Kim 1985).

That is, the villages are classified into three categories: baseline, self-helped, and self-sufficient. Then, the cooperative efforts of each village are compared to the government's criteria, which differs across the three categories of villages. The principle of "the better village, the first support" is an effective stimulator of people's motivation (Whang 1983). Based on the fact, let the aggregated outcome of the project composed of a iteration of cooperation be:

$$AO_T = \text{success} \quad ; \text{ if } DB_{iT} > DB_G^*,$$

$$\text{failure} \quad ; \text{ if } DB_{iT} > DB_G^*,$$

, where AO_T = aggregated outcome of T<u>th</u> project,
DB_{iT} = development benefit of T<u>th</u> project of village i,
DB_G^* = the government's criteria for the project T of village classification village i belongs to.

Using this Village Classification System, therefore, government can influence the game.

(5) <u>Information Rule</u> : It specifies the kind of information available to each position at each node. At the first node, Saemaul leaders can access to necessary information and technology, and the potential payoffs through the formal Saemaul leader training offered by the government (KIOS 1977; Rondinelli 1983). Knowing what is the best strategy and discussion about it can increase the possibility of cooperation among the players (Ostrom and Walker 1989). In our case, Saemaul leaders mainly concentrate their efforts on informing their neighbors of what is the best strategy (Park 1974). The farmers, therefore, have sufficient information about how their actions are related to the

aggregated outcomes, what is their payoff, and the technical details of the projects. In addition, they can know others' previous actions and the exact number of people who choose a specific strategy (i.e., N_B, N_C, N_D, where N_I means the number of people whose strategy is I). The government provided formal training for Saemaul leaders and publishes monthly magazine Saemaul to encourage Saemaul leaders and enlighten farmers (KIOS 1977; Park 1974; Republic of Korea 1984).

(6) Payoff Rule : It specifies how benefits and costs are required. Farmers are required to invest their voluntary, unpaid labor and sometimes, capitals. The benefits of infrastructure usually cannot be withdrawn from the defectors, whereas the costs of providing them are paid by the cooperators. The government also provides supports. The government's supports are usually 30% of the total costs of projects (Whang 1981). But, as mentioned before, the amount of the government's support is determined by the result of the previous projects and the village classification the village belongs to. Based on these facts, I assume that payoffs for an individual farmer who use B_n and cooperates is:

$$\pi_{iT} = DB_T - [((1-\delta)*DC_T)/m] \quad ; \text{ if } AO_{T-1} \text{ is success,}$$

$$DB_T - (DC_T/m) \quad ; \text{ if } AO_{T-1} \text{ is failure,}$$

,where π_{iT} = payoff of project T for individual farmer i,
DB_T = development benefit of project T,
DC_T = development cost of project T,
δ = proportion of government's support,
DC_T = development cost of project T,

$$m = N-N_D-K.$$

Payoff for an individual farmer who use B_n and defect is:

$$\pi_{iT} = DB_T \quad ; \text{ irrespective of } AO_{T-1}$$

The payoff for the Saemaul leaders are almost same as that of their neighbors except that there are some non-monetary rewards (Rondinelli 1983; KIOS 1977; Park 1974). Successful and dedicated Saemaul leaders receive Saemaul Orders of Merit and other medals from President Park. Stories of selected successful village Saemaul leaders are widely publicized through mass media. Most of Saemaul leaders regard their positions as a honor and feel that they are respected by their neighbors (Park 1974; Whang 1983). Without these awards, it would be difficult to find motivated people to serve as Saemaul leader (Rondinelli 1983; Aqua 1974).

(7) Scope Rule : It specifies the set of outcomes that may be affected. Farmers can change the implementing aggregation rules by changing K, the development benefit of project T, DB_T, and the amount of the agricultural products. More important, most parameters are beyond the reach of the farmers. Village boundary, Village classification criteria, DB_G^*, proportion of the government's support, δ, and the government purchase price of the agricultural product, p, all of these important parameters are decided by the government, and farmers have no formal way to be involved in deciding these parameters.

3. Policy Implications

So far, we have seen operational rules-in-use. As we saw, the government provided incentives to promote voluntary provision of rural infrastructure. Even though Saemaul Undong was initiated and planned by the central government (Aqua 1974), the main cause of the early success of Saemaul Undong was voluntary cooperation of the farmers. The government knew this fact, and took advantage of it (Whang 1981). The government provided training for Saemaul leaders, informed farmers of necessary information and best strategies, recognized and encouraged informal village organizations, and affected payoff functions through parameters such as DB_G^*, δ, and p, in order to offer incentive structures for the farmers. As a result, they changed the incentive structure of the game.

Here, let me briefly examine the relation between several parameters including proportion of government's support, δ, discount parameter, α_i, and the temptation to defect, α_i^*. First, For simplicity, let

$$DB_T = M*\beta,$$

where M = number of people who cooperate,
β = production coefficient (> 0)

and let AO_{T-1} = success.

In our case:

$$P_i(S_{-1}^{+}) = (N_B-K-1)*\beta,$$

$$U_i(S^{+}) = (N_B-K)*\beta - (1-\delta)*DC_T/(N_B-K),$$

$$U_i(S^{-}) = 0,$$

For our game to be a Harsanyi dilemma game, we need the following condition:

$$(1-\delta)*DC_T/(N_B-K)^2 < \beta < (1-\delta)*DC_T/(N_B-K)$$ [10]

And, the temptation of defect, denoted as $\alpha_i^* = \{P_i(S_{-1}^+) - U_i(S^+)\}/\{P_i(S_{-1}^+) - U_i(S^-)\}$, can be written as:

$$\alpha_i^* = \{\beta*(K-N_B)+(1-\delta)*DC_T\}/\beta*(N_B-K-1)*(N_B-K)$$ [11]

Now, we can say that if $\alpha_i \geq \alpha_i^*$, then $S = (C^\infty, C^\infty/B_n, \ldots, B_n/D^\infty, \ldots D^\infty)$ can be an equilibrium. That is:

If $\alpha_i \geq \alpha_i^* = \{\beta*(K-N_B)+(1-\delta)*DC_T\}/\beta*(N_B-K-1)*(N_B-K)$, then cooperation can be an equilibrium.

Solving this inequality for δ, we can get:

$$\delta \geq 1 - [\{\alpha_i*\beta*(N_B-K-1)*(N_B-K)+\beta*(N_B-K)\}/DC_T].$$

This inequality implies that government support rate is related to the production coefficient, individual share of development cost, and the attributes of the target community denoted by K and α_i. In other words, if government can know those parameters mentioned just before, government support rate can be an efficient policy tool. Also, we can know that (i) as β, α_i, and N_B increase, δ can be smaller without decreasing the

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[10] For a game to be a Harsanyi dilemma game, we need two conditions. First, universal cooperation is more efficient than universal defection. That is: $U_i(S^+)>U_i(S^-)$, which is equivalent to $(N_B-K)*\beta - (1-\delta)*DC_T/(N_B-K)>0$. Solving this inequality for β, we can get, $\beta > (1-\delta)*DC_T/(N_B-K)^2$. Second, defection is strictly dominant. That is: $P_i(S_{-1}^+) > U_i(S^+)$, which is equivalent to $(N_B-K-1)*\beta > (N_B-K)*\beta - (1-\delta)*DC_T/(N_B-K)$. Solving this inequality, we can get, $\beta < (1-\delta)*DC_T/(N_B-K)$. From these two inequalities, we can say that our game is a Harsanyi dilemma game iff $(1-\delta)*DC_T/(N_B-K)^2 < \beta < (1-\delta)*DC_T/(N_B-K)$.

[11] Notice that, as Raub points out, our production function is a "variant of Hardin's game without rivalness". It means that the utility which an actor derives from a given amount of the good, in our case, infrastructure, is independent of the number of other actors who consume the good. In this case, the temptation to defect decreases with increasing group size (Raub 1988, 343-34).

possibility that cooperation can be an equilibrium; and (ii) as K, DC_T increase, we need large δ to ensure the equilibrium of cooperation.

What is noticeable is that if government can assume some problematic situation as a repeated game and can know the parameters mentioned above, government can achieve policy objectives with less cost than if it cannot. Like this, the government can affect the outcome of the game and the equilibrium by changing both δ and DB_G^*, and the effectiveness of the government's policy is dependent on ß, DC_T, N_B, and K.

IV. DISCUSSION

1. Design Principle:

Ostrom suggests Design Principle which is commonly found in robust CPR organizations (1990. ch.3). Even though our case is provision of infrastructure which is different from CPR situation, I think, this principles will be helpful in understanding Saemaul Undong. In general, Saemaul Undong satisfies most design principles except two. It has clearly defined boundary (principle 1: clearly defined boundary). Most rules-in-use are congruent with local condition (principle 2: congruence between rules and local conditions). Village Classification System enables congruence between rules-in-use and local conditions. Moreover, the boundary, village, combined with rules-in-use, facilitates cooperation among players. Villagers can meet, discuss about Saemaul projects and modify rules-in-use

in the Village General Meeting (principle 3: collective choice arrangement). And It also plays a role as a Conflict resolution mechanism (principle 6: conflict resolution mechanism). In addition, government not only recognize the right to form village level organizations, but also encourage the farmers to organize (principle 7: minimal recognition of right to organize). And, as mentioned in ch. 2, Saemaul Undong activities are organized in multiple layers of nested enterprises (principle 8: nested enterprises). But, there is no monitoring and sanction mechanism (principle 3 and 4). The reason for the absence of these mechanisms may be, I guess, the provision of infrastructure is "fence", while CPR situation is "trap" (see Messick and Brewer 1983). Moreover, according to them, provision of public good is "no-delay collective fence", which is relatively easy-to-solve. Maybe that is why Saemaul Undong can be successful without them. But, despite of remarkable success in 1970's, Saemaul Undong was fragile rather than robust (see Ostrom 1990). It is probably because farmers have no control over the exogenous factors which have crucial impacts on the game. Even though Saemaul Undong activities are organized in multiple layers of nested enterprises, these organizations are highly centralized and out of the reach of farmers. Based on this fact, I think, we can think of one more principle: veto mechanism, especially in the highly centralized political system.

2. Veto Mechanism:

As Herzberg and Ostrom (1980) maintain, in democratic political system, there exists the possibility that majority exploits minority. In particular, in case where minorities have extremely serious problem but their interest cannot be represented because of their number, we need veto mechanism. It refers to some formal mechanism of rejecting what is decided in democratic way such as majority rule, but seriously threatens minority's interests due to some external factors.

Saemaul Undong can be summarized as an effort to increase rural income through the creation of productive bases - physical infrastructure. By encouraging provision of rural infrastructure, government wants to achieve ultimate gaol: income increase in rural sector. To achieve this gaol, we need one more policy tool - high-rice-price policy, and government employed that policy in 1970's for whatever reason. By 1979 when the goal of sufficiency in food was achieved, government gave up high-rice-price policy and allowed import of agricultural products. This changes were inevitable because of (i) the accumulation of finance deficit and inflatory pressure due to high-rice-price policy; and (ii) the increasing pressure to open domestic market. It was uncontrollable factor for both farmers and the government.

But, more importantly, in this drastically changing socio-economic conditions, farmer have no way to represent their interests. According to Korean "Law of Government Organization", local government refers to agencies whose jurisdiction affects local territories. No local government is political unit able to

make autonomous political decisions on the basis of constituency power (Aqua 1974; Kim 1985). In addition, the members of Korean National Assembly, by the Constitution, are supposed to represent not their constituency but the whole Nation. It means that Korean farmers have no way to represent their interests or veto some decision which jeopardizes even their survival. In action situation, they do have collective choice arena, the village General Meeting, where they can change rules affecting their actions. However, the village is not an administrative unit which can decide or suggest some rule change (Steinberg 1984). Saemaul leaders are also not allowed to be involved in formal decision making process concerning agricultural policies, even though they get formal training from the government. Recently, as a result, farmers began to form somewhat radical and national-level organization and exercise their veto power in informal ways such as political protest, mass demonstration (Kim 1987; Chang 1987). These efforts are, however, not recognized by the government. In sum, to overcome crisis comes from the uncontrollable, we need veto mechanism with which players can refuse to admit uncontrollable parameters jeopardizing even their subsistence.

V. CONCLUSION

Most scholars agree that Saemaul Undong in 1970's was successful due to the Saemaul leaders and the government's efforts through the Village Classification System, Saemaul

Leaders Training Institute (Kim 1985; KIOS 1977; Yu et al. 1980; Yu 1980; Rho 1977; Park 1974). This is the case in the sense that these two have succeeded in sustaining voluntary cooperation among the farmers. Korean government provided necessary information for the farmers through Saemaul leaders, Saemaul leaders, in turn, informed their neighbors of the necessary information and the best feasible strategies. After initiation, government's supports, based on the level of farmers cooperative efforts, were successful in providing strong and efficient incentives for the farmers, accordingly farmers did cooperate both actively and voluntarily.

In conclusion, let me briefly discuss about some problems. First, the problem of getting to cooperation in the first place. Formal theory cannot give us an answer. But, as we can see, there exist many cooperative collective actions. In our case, we can say that cooperation was initiated through both dedication of Saemaul leaders and the strong family and kinship ties of rural villages. Because of these factors, we can assume that players will employ "nice" strategy - which means starting with cooperation, and we can infer the relationship between parameters. Based on this inference, I maintain that government support rate can be an effective policy tool under several conditions. But, the effectiveness is eventually dependent on the parameters such as K, α_i and ß which is unique to villages. If we assume that such parameters can be more easily perceived by the lower level government, we can say that central government's

capability to decide appropriate policy tools, such as government support rate in our case, may be extremely limited. In transition period, especially, it is likely to make serious mistakes, either intentionally or unintentionally, without a proper way of representing minority interests. This is the problem of interposing a veto. Brennan and Buchanan maintain that "good games depend on good rules more than they depend on good players" (1985, 150). That may be the case. But, I think, whether rules of the game is good or not is decided by whether these rules are under the control of the players or not. And, accordingly, good games depend on whether or not rules are under the control of the players.

BIBLIOGRAPHY

Aqua, Ronald. (1974). Local Institutions and Rural Development in South Korea. Special Series on Rural Local Government. Ithaca, New York: The Rural Development Committee.

Axelrod, Robert. (1981). "The emergence of Cooperation among Egoists", American Political Science Review. 75:306-318.

Bendor, Jonathan. (1988). "In Good Times and Bad: Reciprocity in an Uncertain World", American Journal of Political Science. 31:531-558.

Ben-Porath, Yoram. (1980). "The F-Connection: Families, Friends and Firms and the Organizations of Exchange", Population and Development Review. Vol. 6. No. 1, 1-31.

Bianco, W and R. Bates. (1990). "Cooperation by Design: The Role of Leadership in Collective Dilemmas", American Political Science Review. 84:133-147.

Blomquist, W. and E. Ostrom. (1985). "Institutional Capacity and the Resolution of a Commons Dilemma", Policy Studies Review. 5:383-93.

Brennam, Geffrey and James N. Buchanan. (1985). The REason of Rules. Constitutional Political Economy. Cambridge: Cambridge University Press.

Chang, Sung-Uk. (1986). "NACF Democratization Movements", Shin Dong Ah. November 1986: 362-383. (in Korean).

Chung, Young-Il. (1987). "What Degenerates Rural Economy?", Shin Dong Ah. November 1987: 562-570. (in Korean).

Dawes, Robyn. (1975). "Formal Theories if Dilemmas in Social Decision Making", in Martin Kaplan and S. Schwartz (eds.) Human Judgement and Social Process. New York: Academic Press. 87-107.

Diekmann, A. (1985). "Volunteer's Dilemma", Journal of Conflict Resolution. 29:605-610.

Follett, Mary Parker. (1940). "Constructive Conflicts". in H. C. Metcalt and L. Urwick (eds.) Dynamics Administration. New York: Harper and Row Publishers. 30-49.

Friedman, J. W. (1986). Game Theory with Applications to Economics. New York: Oxford University Press.

Gardner, Roy and E. Ostrom. (1990). "Rules and Games" Public Choice. forthcoming.

Hankuk Daily Newspaper. March 9, 1990. (in Korean).

Hardin, Russel. (1971). "Collective Action as an Agreeable n Persons' Dilemma", Behavioral Science. 16:472-81.

Herzberg, Roberta and Vincent Ostrom. (1980). "Votes and Vetoes", in F. X. Kaufman, G. Majone and Vincent Ostrom, (eds.) Guidance,Control and Evaluation in the Public Sector. Berlin and New York: Walter de Gruyter. 431-43.

Kim, Hae Dong. (1974). "Theoretical Foundations of Saemaul Movement. II", Korean Journal of Public Administration. Vol.XII. No.2. 30-47. (in Korean).

Kim, Sung-Hoon. (1986). "Fundamental Change in Agricultural

Policy is Urgent", Shin Dong Ah. May 1986: 436-447. (in Korean).

_____. (1987). "Problems of Agricultural Policy", Shin Dong Ah. September 1987: 320-329. (in Korean).

_____. (1988). "The Beginning of Saemaul Movement", Shin Dong Ah. January 1988: 186-191. (in Korean).

Kim, Young Jung and Moo Han Yoon. (1978). "Who Manipulates the Price of Agricultural Products?", Shin Dong Ah. November 1978: 170-183. (in Korean).

Kim, Young Pyoung. (1985). "New Dynamics for Rural Development: The Experience of Saemaul Undong", in Bum Woong Kim, David S. Bell, Jr. and Chong Bum Lee, (eds.) Administrative Dynamics and development: The Korean Experience. Seoul Korea: Kyobo Publishing, Inc. 312-347.

Korea Oversea Information Service (KOIS). (1977). Saemaul Undong". Korean Background Series. Seoul Korea.

Ko, Young Bok, Byung Yoon Lim and Jung Whan Ju. (1979). "Why Farmers are Leaving Rural Villages?", Shin Dong Ah. July 1979:92-111. (in Korean).

Kreps, D. M., J. D. Robert, P. Milgrom and R. Wilson. (1982). "Rational Cooperation in the Finitely Repeated Prisoners' Dilemma", Journal of Economic Theory. 27:245-252.

Messick, D. M. and M. B. Brewer. (1983). "Solving Social Dilemma: A Review", in L. Wheeler and P. Shaver (eds.) Review of Personality and Social Psychology. Vol.4. 11-44.

Olson, Mancur. (1965). The Logic of Collective Action: Public Goods and the Theory of Groups. Cambridge: Harvard University Press.

Ostrom, Elinor. (1986). "An Agenda for the Study of Institution", Public Choice. 48:3-25.

_____ and J. M. Walker. (1990). Communication in a Commons: Cooperation without External Enforcement", in T. Palfrey (ed.) Experimentation in Political Science. Forthcoming.

_____. (1990). Governing the Commons: The evolution of Institutions for Collective Action. New York: Cambridge University Press.

Park, Dong Se. (1974). "The Role of Saemaul Leaders", Korean Journal of Public Administration. Vol.XII. No.2. 48-82. (in Korean).

Park, Chung Hee. (1979). Saemaul: Korea's New Community Movement. Seoul Korea: Korea Textbook Co., Ltd.

Raub, W. (1988). "Problematic Social Situations and the 'Large Number' Dilemma: A Game Theoretic Analysis", Journal of Mathematical Sociology. 13:311-357.

Republic of Korea. (1982). Saemaul in New Village. Seoul:Korea.

Rho, Wha Joon. (1977). "Commonality Analysis and Causal Modelling of New Community Program", Korean Journal of Public Administration. Vol.XV. No.2. 1-18.

Rondinelli, Dennis A. (1983). Development Project as Policy Experiment: An Adaptive Approach to Development Administration. London and New York: Methuen.

Runge, C. Ford. (1984). "Institutions and the Free Rider: The Assurance Problem in Collective Action", Journal of

Politics. 46:154-181.
Sell, Jane. (1988). "Types of Public Goods and Free-Riding", in E. Lawler and B. Markovsky (eds.) Advances in Group Process. Vol.1. 119-140.
_____. and Rick K. Wilson. (1989). "Levels of Information and Contribution to Public Goods". Working Paper 89-5. Bloomington, Indiana: Workshop in Political Theory and Policy Analysis.
Steinberg, David I. (1984). "The Dynamics of the Development of Rural Korea", in USAID Korean Agricultural Services. AID Evaluation Publication Series.
Taylor, Michael. (1987). The Possibility of Cooperation. Cambridge: Cambridge University Press.
Uphoff, Norman. (1986). Local Institutional Development. Ichita New York: Cornell University Kumarian Press.
Whang, In Joung. (1981). Management of Rural Change in Korea: The Seamaul Undong. Korean Studies Series No.5. Seoul Korea: Seoul National University Press.
Yu, Hoon. (1980). "The Evaluation of Saemaul Movement", Korean Journal of Public Administration. Vol.XVIII. No.2. 251-280. (in Korean).
_____, Dong Se Park, Roger W. Benjamin and John E. Turner. (1980). "A Study on the Evaluation of Saemaul Movement", Korean Journal of Public Administration. Vol.XVIII. No.1. 1-25. (in Korean).
Yoon, Jae Kul. (1987). "Headquarter of Saemaul Undong". Shin Dong Ah. September 1987:534-553. (in Korean).