論文題目 Social Capital in Participatory Forest Management:

a study on its application and evaluation

(参加型森林管理におけるソーシャル・キャピタルの適用と評価に関する

研究)

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1.　Introduction

Today, the effect by humans on natural resources cannot be ignored: as Crutzen & Stoermer (2000) express, we now live in the era of the *Anthropocene* in which Earth system processes from local to global scales are strongly shaped by humanity. The perspective of the human system as a dominant subsystem has expanded and become a high-priority systems issue in the research literature on *natural resource management (NRM)* (Olsson *et al.* 2004; Folke, 2007; Folke *et al.* 2007); thus including human dimensions into ecological system is requisite. On the other hands, there is increasing consensus that the cause of resource degradation is institutional (Acheson, 2006). Studies of the governance for common-pool resources revealed the importance of self-organized resource governance system, which is expected to be effective for NRM. As a result, the *participatory (PA)* approach has been broadly focused as one of the important alternative institutions for NRM to tackle the past failing policies and institutional failures. The new policy trend are based on the recognition that communities can often manage their resources better than either private actors negotiating through market-based exchanges or state actors regulating through command and control policies (Agrawal, 2003). The management of natural resources is most often a question of collective management involving many actors even in countries with well-developed regulatory regimes (Saglie *et al.* 2006). Accordingly, many scholars point out that *social capital (SC)* as forms of networks and trust can play an important role in PANRM with combining fragmented institutions and promoting reciprocity (Ostrom, 1990;1992; 1999; Gibson *et al.* 2000; Wondoleck *et al.* 2000; Pretty, 2003; Toko *et al.* 2005). Yet, SC concept has a theoretical weakness because of its broaden definition and logical circularity; consequently, not a few critics and cautions raised recently (see Portes, 1998; Englebert *et al.* 2001; Durlauf, 2002; Quibria, 2003; Ponthieux, 2004). Hence, this study seeks to develop a coherent conceptual framework to apply SC concept in PABRM context, focusing participatory forest management (PAFM) cases.

2. Objectives

In order to contribute to further researches and policies of SC and PAFM, this study aims to:

i) Develop a framework and methods for applying SC concept comprehensively in PAFM

ii) Analyse cases from empirical studies with applying the developed framework in order to verify the framework, and

iii) Conclusively, the framework and methods of application of SC concept in PAFM is developed and recommendation for policies is suggested

3. Materials and methods

3.1 Theoretical part

The materials collected and analysed for developing a conceptual framework of SC in PAFM. The collected data were reviewed to categorize into analogical theories; then these analogical theories were extracted and grouped for inductive generalization of findings of previous studies. This process was repeated in each objective: i.e., clarifying SC definition, summarizing methodology for SC measurement, and identifying the current problems of SC theory. Subsequently, theoretical backgrounds of the study became concrete and a conceptual framework with coherent methods was developed.

3.2 Empirical Part

The empirical part consists of two chapters: a pilot study and a comparative case study. Both case studies were conducted by applying the framework developed in the theoretical part in order to verify the framework as well as to analyse SC roles in PAFM. The methods applied were: literature and secondary data analysis, participant observation, semi-structured interviews, structured questionnaires and social network analysis. Each method is related to results from precedent researches. Final social network analysis contributes to strengthen qualitative results from other methods. Conclusively, a developed framework and policy recommendation were exhibited.

4. Results

4.1 Theoretical part

From the literature analysis, SC verification matrix which includes representative definitions and theories from previous studies of SC was developed (Table 1). The matrix identifies six categories of SC with integrating multi-dimensional aspects. The vertical column classifies the structural and the cognitive sources of SC and the horizontal column classifies the SC functions in three different social interaction scale (SIS); hence, each category explains characteristics that constitute forms of SC.

Table 1 SC verification matrix

SIS / Source	Bonding Within a group	Bridging Between groups	Linking Between different social hierarchies
Structural Tie structure giving opportunities to an actor	**SBo.** (Structural Bonding characteristics) generated by tie structure in a group, which bonds actors in the group	**SBr.** (Structural Bridging characteristics) generated by tie structure between groups, which bridges actors between groups	**SLi.** (Structural Linking characteristics) generated by tie structure between a group and a formal institution in higher social hierarchy, which links them
Cognitive Tie content giving motivation and ability to an actor	**CBo.** (Cognitive Bonding characteristics) shaped by tie content in a group, which bonds actors in the group	**CBr.** (Cognitive Bridging characteristics) shaped by tie content between groups, which bridges actors between groups	**CLi.** (Cognitive Linking characteristics) shaped by tie content between a group and a formal institution in higher social hierarchy, which links them

Depending on a research context, what kinds of aspects of SC matter is different. Thus, SC verification matrix helps to clarify which characteristics of SC should be targeted and consequently, setting proxy indicators of each category can be more objectively. The matrix is expected to evaluate SC characteristics comprehensively with coherent definitions.

4.2 Empirical part

PAFM in patchy Satoyama conservation activities in residential area in Hachioji, Tokyo was selected as case study target. The significances of the study target are: i) it is mostly abandoned natural environment because of the out of modern institutions; ii) it is historically managed by community; iii) it is important natural environment for biodiversity and for amenity in urban residential area: thus, the needs for new values and institution for its conservation is high. After the pre-survey of 24 voluntary organization in Hachioji, case A and case B were selected as targets for a comparative case study, of which the quality and scale of the activities are quite different from each other. From both qualitative analysis and the network analysis revealed that case A is activated by bonding SC (SBo.) but bridging (SBr.) and linking SC (SLi.) was scarce; whereas in the case B, SBo. is not strong but there exist well-developed SBr. and SLi. (Fig. 3). In summary, case B with more developed bridging and linking SC performed highly professional with gaining human and financial resources as well as knowledge from various interactions. Although under the same institutions, SC differences result in the differences of conservation activity performance.

5. Discussion

The developed framework captured SC in PAFM context comprehensively; hence, its availability was verified. In previous empirical studies, no research measures the whole SC characteristics but only a few aspects of SC; consequently, it is difficult to do comparison between findings from different researches. Therefore, contributions of the developed framework for further studies are: i) the framework can identify all six SC characteristics that are supposed to be prerequisite for PAFM; ii) it is also effective to compare the results from different empirical studies with a coherent definition of SC, which makes it possible to argue SC roles in PAFM within a same framework. From the results of case studies, it was indicated that: SC is generated by PA; bonding SC can be automatically generated by spatial-temporal context; however, bridging and linking SC can be hardly generated without actors' behaviours nor governmental supports; bonding SC can be motivation for PA activities but cannot work for scaling-up of activities; in order to broaden and to sustain PA activities, bridging and linking SC are crucial; in general, structural aspects of SC generate cognitive aspects.

6. Conclusion and recommendation

SC is strongly related to PA approaches. Therefore, PAFM policies are expected to include SC visions. Particularly, creation of structural SC in the beginning of PA approaches result in generation of cognitive SC as well. Thus, networking is crucial for the sustainability of PANRM. *Participatory* should not be leaving all practices on voluntary groups; the government is expected to support SC generation, especially linking SC is necessary from the beginning of PA approaches. If well-balanced SC is developed in PANRM, voluntary groups or local communities can be *self-organized*, which result in sustainable NRM with minimum cost.

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