

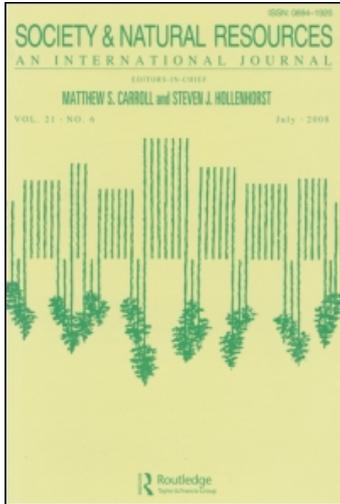
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It's Who You Know: Social Capital, Social Networks, and Watershed Groups

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Social capital, usually conceptualized as trusting relationships among members of a group, is often discussed as playing an important role in watershed groups. This study is grounded in the social networks conceptualization of social capital and seeks to identify how access to social resources aids in achieving watershed group outcomes. Three comparative cases along a rural–urban continuum in the Midwest were studied using qualitative in-depth interviews (n = 38) and meeting observation. The major finding of this research is that purposive selection of watershed-group participants to provide the greatest access to human capital and social network ties aids watershed groups in achieving outcomes. Guidance provided by state agencies to newly formed watershed groups should include suggestions for what types of network ties might be most beneficial for different objectives and how such ties can be sought out.

Keywords collaboration, social capital, social networks, watershed groups

Collaborative watershed groups play a pivotal role in encouraging adoption of voluntary practices to improve water quality across the United States. An array of studies has explored successful group process, and a frequently cited characteristic of success is “social capital.” However, social capital is often poorly defined and weakly conceptualized in the literature on watershed groups, and has not been adequately extended to outcomes beyond group process factors. In this article, we explore the concept of social capital, defined by access to social networks, and determine how three different watershed groups funded through U.S. Environmental Protection Agency (EPA) Clean Water Act (CWA) 319 funds in the Midwest use

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social networks to achieve project goals. Section 319 funds are distributed by the federal government to states for managing nonpoint source pollution (NPS); Hardy and Koontz (2008) recommend that attention be given to examining the impact of 319 funds on watershed group outcomes. The findings from this study lead to conclusions about how groups can purposively utilize social networks to improve outcomes.

Collaborative Watershed Groups

Collaborative watershed management, in ideal situations, is characterized by “shared decision-making and implementation by public and private sector partners” (27) invested in water resources protection (Michaels 2001). Watershed groups may be comprised primarily of agency representatives, citizens, or both and composition is related to watershed group outcomes (Moore and Koontz 2003). Dakins et al. (2005) describe three watershed group membership types that affect participant perceptions of group process: *representative*, in which each a balance of interests is allowed a given number of representatives in the planning process; *open*, where anyone who is interested can participate; and *restricted*, where all participants who meet criteria, such as land ownership, can participate in the process. Bidwell and Ryan (2006) found that organizational affiliation played a role in group accomplishments.

“Success” for collaboration in natural resources settings has focused on two themes: environmental and organizational. According to Kenney (2000), two scales exist by which success can be measured. The first scale refers to the achievement of specific environmental objectives. Because of the time necessary to observe environmental successes, a second scale emerged that measures organizational achievements, intended as intermediate measures of water quality improvement. We suggest an additional scale is necessary—one that identifies outcomes beyond group process but prior to environmental outcomes. For the purposes of this research, outcomes refer to watershed group objectives attained through the use of social network ties.

Social Capital

The concepts, definitions, and effects of social capital are widely debated (Colclough and Sitaraman 2005; Rydin and Holman 2004; Stolle and Hooghe 2004), and the literature stresses the need to define social capital, address its effects in different situations, and identify means by which it is promoted. As such, two perspectives are prevalent in the literature on social capital. The first and most common perspective considers social capital to emerge in the form of norms and trust at the group level (e.g., Putnam 2000). The second perspective considers social capital as resources available to an individual as a result of their network ties (e.g., Lin 2001). Group-level social capital variables examine variables such as norms and sanctions that function to protect a closed group of people (Coleman 1990). Coleman (1990) believes that social capital is held within the social structure and isn’t fungible. Lin (2001), however, considers social capital as resources available to an individual through their network ties: It is rational actions that lead to the formation of social structure. These different approaches can lead to conflicting and ambiguous measurements and comparisons of social capital data. In this study, we employ the “network resources” definition of social capital introduced by Lin. We define and compare the definitions and provide the rationale for our choice below.

Putnam (2000) includes “social networks and the norms of reciprocity and trustworthiness that arise from them” (19) as possible causes and effects of civic participation. As Portes (1998) points out, “As a property of community and nations rather than individuals, social capital is simultaneously a cause and an effect. It leads to positive outcomes . . . and its existence is inferred from the same outcomes” (19). Coleman (1990) describes social capital as a “variety of entities with two elements in common: They all consist of some aspect of social structures, and they facilitate certain action of actors . . . within the structure” (302). Coleman’s approach has been said to only recognize social capital when a positive outcome is observable (Lin 2001). Lin developed a definition of social capital that does not limit the existence of social capital only to instances where it has had a positive outcome: Social capital is “the resources embedded in social networks accessed and used by actors for actions” (25).

Functions of Social Networks

Weak ties (Granovetter 1973) and bridging structural holes (Burt 1992) can increase individual and group access to information. Structural holes are missing links between different networks in a social structure through which information doesn’t flow; when a certain group of people has network ties that can facilitate information transfer between groups, they bridge structural holes (Burt 1992). The social networks approach to social capital is grounded in the premise that individuals or groups have access to resources depending upon where they are in a given social structure (Burt 2004; Lin 2001; Coleman 1990). For instance, Burt (2004) puts forth that those individuals that bridge structural holes between two or more groups of people will be able to identify information from one group that can assist another. As he states, “Idea generation at some point involves someone moving knowledge from this group to that, or combining bits of knowledge across groups” (356). Thus, groups have access to different types of information and resources if there are people in the group that can bridge structural holes. Weak ties are also essential components for increasing information diffusion (Granovetter 1973; 1983). For example, if one closed group of people would like to increase the adoption of a new idea or technology, it’s difficult to bring new people on board without weak ties to spread information (Granovetter 1983).

Schneider et al. (2003) put forth that networks are purposefully formed in resource allocation issues and examined four types of networks in National Estuary Program (NEP) and non-NEP estuaries: vertical boundary-spanning networks that integrate agencies working within multiple levels of government; horizontal boundary-spanning networks that exist within a geographic area, and are comprised of local jurisdictions (Ostrom 1972); expertise boundary-spanning networks that connect external policy expertise (Zafonte and Sabatier 1998); and ideological boundary-spanning networks that can provide a basis for negotiation between different interests. Much like vertical boundary-spanning networks, Rydin and Holman (2004) introduce bracing capital, which strengthens networks links across vertical levels of policy makers but does not operate with all actors. Previously, Putnam (2000) had identified bonding social capital, which builds links across a community, and bridging, which forms links between communities. Bonding capital is conceptually similar to the horizontal boundary-spanning networks discussed by Schneider et al. (2003). Ideally, building networks or capital at different levels will increase the likelihood that policy goals will actually be achieved (Rydin and Holman 2004).

Table 1. Selected social capital and social network studies in natural resources

Author(s)	Focus of research ^a	Conceptualization and measurement
Harshaw and Tindall (2005)	Effects of networks on social identity and forest values	Individual level social capital; examined individual social networks
Schneider et al. (2003)	Comparison of vertical, expertise, ideological, and horizontal boundary-spanning networks in National Estuary Program	Traditional social network analysis—links among organizations
Leach et al. (2002)	Effect of watershed group participation on human and social capital (participant perceptions)	Coleman, Putnam: authors asked respondents if they had formed new relationships, improved awareness of watershed processes, and improved understanding of other interests as a result of participation in the group
Rydin and Holman (2004)	Examine multiple conceptualizations of social capital in the literature	Focus on defining types of networks (bonding, bracing, bridging) that comprise organizational social capital, not causes or outcomes of social capital

^aRefers to how social capital or social networks were used in the study: authors may have examined other factors in their research.

Various conceptualizations of social networks and capital have been applied to natural resource settings (Table 1). Researchers have employed empirical analyses of networks and forest values (Harshaw and Tindall 2005), the effect of networks on cooperation (Schneider et al. 2003), and the role of networks in increasing regulatory compliance (Scholz and Wang 2006), and examined perceptions of social capital in watershed groups (Leach et al. 2002). These studies use different definitions of social capital, don't adhere to a single conceptualization, or don't clearly define causes and outcomes of social capital or how it relates to social networks. This study seeks to address these concerns with the following research question: How are networks used, and what outcomes are attained through them, by watershed group members?

Project Background and Case Selection

This study is one piece of a larger social indicators project being conducted in U.S. Environmental Protection Agency Region 5 and discussed in Prokopy et al. (2009), Genskow and Prokopy (2010), and Genskow and Prokopy (2008). Because the

nature of the social indicators project requires assessing the relevance of indicators across watershed groups receiving 319 funds in Region 5, cross-sectional criterion sampling logic (Patton 1990) was used to select watershed groups. For the first phase of social indicators research, three watersheds were selected from 60 projects active at the time the study commenced. Criteria for case selection included: (1) location in different regions of the state, (2) beginning planning, mid-implementation, and end of implementation, (3) location along a rural–urban continuum, and (4) recipient of 319 funds.

Watershed-A¹ is an approximately 160 square miles urbanizing agricultural watershed that drains to a reservoir that provides drinking water for a mid-size city. In the mid-1990s local agencies and concerned citizens joined together to form a watershed group. A local university assisted the group with completing its management plan in 2005, and subsequently received a CWA 319 implementation grant. The grant is housed at the university, and matching funds come from the city water company. The vast majority of participants in Watershed-A are agency representatives with a three to one ratio of agency participants (Table 2). In this research, agency personnel are those associated with a local agency (such as Soil and Water Conservation Districts [SWCDs] and Natural Resources Conservation Service [NRCS]), regional, or state agency such as the Department of Natural Resources (DNR).

Watershed-B is approximately 200 square miles and primarily an agricultural watershed, with portions of a small city within its bounds. In 2003, the local SWCD received a 319 planning grant in order to address impairments in the watershed.

Table 2. Watershed-group participants

Watershed-A	Watershed-B	Watershed-C
<ul style="list-style-type: none"> • University staff <ul style="list-style-type: none"> ◦ Full-time coordinator ◦ Agricultural BMP promoter ◦ Resources available through other staff • City Water <ul style="list-style-type: none"> ◦ Environmental educator • SWCD staff • NRCS staff • State environmental education offices • Local park representatives • Environmental consulting firm • Two non-agency citizens • County health department • County waste management • State government representative 	<ul style="list-style-type: none"> • SWCD staff <ul style="list-style-type: none"> ◦ Two full-time contractors • Local farmers • Local children's education facility • Local museum • City engineers office 	<ul style="list-style-type: none"> • SWCD staff <ul style="list-style-type: none"> ◦ One part- to full-time staff member • Local farmers • Local teacher • County health department

Note. BMP, best management practice. SWCD, Soil and Water Conservation District; NRCS, Natural Resources Conservation Service.

The group has two full-time paid staff members contracted by the SWCD and a steering committee comprised of interested citizens. The SWCD is co-located with the Natural Resources Conservation Service (NRCS) and the Farm Service Agency (FSA).

Watershed-C is also an agricultural watershed, but of much smaller size spatially—approximately 28 square miles—than either Watershed-A or Watershed-B. This group, also housed at a local SWCD co-located with NRCS and FSA, received a planning grant in 2005. One SWCD staff member dedicates 20–40 hours per week to the project. There is an apparent lack of interest in participating in the group by watershed residents, although there are one or two farmers and a teacher that occasionally attend meetings. A participant from the county health department regularly attends.

Data Collection

Interviews

In-depth interviews were conducted with all willing members of the watershed groups at two points from 2006 through 2008. This longitudinal design of interview data collection allows for the examination of phenomena as they occur, instead of relying only on participant recall. The interview guide was pilot tested prior to use, and questions were designed to elicit information from participants regarding their links to people both within the watershed group and to other groups that were relevant to their capacity as a group participant. The interviews also served the purpose of informing the development of a position generator (Lin 2001) for a survey of each watershed's targeted population. Interview questions were adapted from the World Bank Social Capital Assessment Tool (institutional capacity questions, particularly those regarding institutional linkages). Questions were also designed to yield information similar to that of a component analysis (Scott 2000), which has been used by others (e.g., Sharp 2001) to assess capacity for action in rural communities. Interview participants signed a consent form that provided information about the study and their rights. Initially, we intended to conduct year two interviews with the same participants from year one. However, because of changes in group participation and individuals' willingness to take part in interviews over multiple years, there was both variation and overlap with interviewees over time (Table 3). Readers will note a significant drop in participation in Watershed-B. This was largely due to issues associated with the high rate of staff turnover, and is reported elsewhere (see Floress 2008).

Table 3. Interview participants and meeting attendance

Watershed	Year one	Year two	Interviewees participating both years	Meeting observation
A	6 (~15) ^a	9 (~15)	3	14 [23] ^b
B	12 (~14)	5 (~7)	2	8 [15]
C	2 (2)	4 (5)	2	6 [10]

^aNumber in parentheses is total number in group at time of interviews.

^bNumber in brackets is total number of meetings watershed group held.

Meeting Observation

We incorporated meeting observation toward the end of year one to ground truth initial themes. Thus, collection of data from meeting observation occurred primarily during year two. Meeting observation notes were utilized to augment findings from the other sources of data. Watershed-A delegated many responsibilities and tasks to subcommittees and thus held many more meetings than the other watershed groups, usually about two per month. Alternatively, Watershed-B was dealing with approximately the same degree of activities through a full steering-committee meeting once per month. We attended as many meetings as possible for each watershed group (see Table 3).

Data Analysis

Strauss and Corbin's (1998) grounded theory was utilized to analyze data. Grounded theory can be used either when exploring an existing theory or when building new theory (Strauss and Corbin 1998). In this research, we build upon existing theory regarding social networks, social capital, and watershed groups. Open coding was performed for each interview, and axial coding and selective coding were completed on the interviews from each watershed separately. Thus, data were analyzed on an individual basis, and then across individuals within a group. Following Strauss and Corbin, categories (organizing concepts), subcategories (concepts that further explain categories), properties (characteristics of a category), and dimensions (the range along which category properties fall) were developed. Finally, selective coding was performed whereby a central category was identified and its relationships with other phenomena were detailed. Analysis focused on identifying how social networks were utilized in watershed groups, particularly for attaining outcomes that would not be possible in the absence of network ties.

Strengths and Limitations of Research Methods

Case-study research and qualitative findings are not generalizable, but may be transferable to similar situations (Lincoln and Guba 1985). Trustworthiness of the data and findings was ensured through triangulation of data sources (different interviewees) and types (meeting observation and interviews) and negative case analysis (Lincoln and Guba 1985), where data are examined specifically to identify any instances where data are not consistent with findings.

The cases described in this research each received Section 319 funding from a state environmental planning organization. Moreover, each group had a "parent organization," as identified by Bidwell and Ryan (2006). Thus, groups that don't receive funding or are driven primarily by citizens without agency involvement are likely to be considerably different than those we discuss.

Findings

Of the three groups studied, Watershed-A utilized its social network resources most often for attaining group outcomes and is the case primarily used to illustrate the findings of this study. Findings from Watershed-B and Watershed-C are used to

highlight differences and similarities among the groups, and to address the importance of having network ties in certain positions to accomplish group tasks.

The final step of grounded theory (selective coding) is to identify a central theme that provide the structures for a theory being built; in this case, *access to human capital*, both for *desired skills and positions* within the group and *bridges to external networks*, was the central phenomenon.

Many of the outcomes attained by Watershed-A can be attributed to its extensive number of social networks, both internal and external, that provided access to human capital skills. Access to human capital was by design. Project managers identified agencies and organizations in the watershed that could assist in attaining outcomes such as providing outreach to producers, accessing environmental education materials, and reaching government officials. The grant sponsoring and matching organizations had internal access to a greater degree of human capital than the other two watershed groups studied. Moreover, there was some degree of redundancy in network ties among group members, so that if one or two participants left the group, there were others that could take their place.

Desired Skills and Positions

In Watershed-A there had been a mixed group in the area prior to the local university taking over the responsibility for the management plan and eventually applying for the implementation grant. Once the new grant was received, the name of the group was changed to reflect the evolution of the group. As one person stated, “We changed the name of the watershed group so we could bring in additional partners. So that the group is multiple groups and organizations falling under one umbrella.” Notice that the focus of the second sentence is on groups and organizations, not on individuals. The group is primarily comprised of agency personnel (see Table 3), and meetings are always held during traditional workday hours.

Participants saw the local university and city water company as key reasons the group was able to accomplish tasks. As one citizen participant said:

While we are still stakeholder driven, we have, [identifies city water company] has been really, really supportive. And then the other key thing is the university, ‘cause they can scrounge around down there and find graduate students such as yourself that can go hither and do this thing. So that’s been a big support base. And that human resource has been instrumental in keeping things going.

Individuals were personally invited to participate. As one participant stated, “I was asked by the staff to join and serve on the committee because of my connection with [environmental education], especially with the state DNR.” Another person reflected upon the degree of care taken by project staff to invite participants:

I think we just have a really good group. I don’t know who selected them, or got them on board, but [they] must have put some thought into, you know, ‘this will be a good person’...we also have a really good group with a lot of professional experience...where a lot of the time with watershed groups they have a hard time getting people, and they are just pulling them out of the watershed.

In addition to illustrating the participant's perception that group composition was well thought out, this comment also establishes that there are differences between watershed groups with different membership types. The interviewee further explained:

I think that is one of the problems with the big citizen driven groups is that they're often very passionate people but they don't necessarily have the skills to, and they don't get the help, and then you have this complex set of skills you need to be able to complete a management plan.

The preceding comment is consistent with findings from Moore and Koontz (2003): Citizen groups are less likely to complete watershed plans.

In contrast, Watershed-B is housed at a local SWCD office and is mainly comprised of local residents. The meetings are held at night instead of during working hours. While Watershed-A has access to in-house resources, both of the other watersheds studied must seek out resources for things like water quality testing and volunteers. While members in Watershed-B and Watershed-C participate on their own time as a volunteer activity, the overwhelming majority of those active in Watershed-A do so as part of their job. The two individuals involved in Watershed-A who are not agency representatives are retired or semiretired.

When members leave the groups in Watershed-B or Watershed-C, a resource is no longer available. There is little redundancy in positions and thus no one to replace the lost human capital. As one interview participant from Watershed-B stated in regard to the group's volunteer water quality monitoring, "We've lost enough of the monitoring people that we don't have enough people to cover all of the sites anymore." Conversely, while Watershed-A has lost several newsletter editors over the course of this research, it had no problems in finding another group member to take on that role.

Staff in Watershed-C attempted to invite participants for human capital access. Unfortunately, interest in the watershed project was somewhat low, and their meetings were often comprised of project personnel and one or two other stakeholders. The project managers attempted to alternate meetings between day and night to make it easier for local elected officials to attend. However, low participation in both meetings led the managers to hold meetings only at night. While participation in meetings may be somewhat underwhelming, a staff member said:

There is a larger group involved and we have received input—not always at the meetings—but they'll stop by the office or they'll call us. You know, they know it's important and they want to stay involved but they may not be able to attend those evening meetings because of other responsibilities.

The same staff member also indicated that the group did receive sponsorship assistance from external resources through purposive formation of new ties, even if the invited participants weren't interested in being directly involved with the project.

They supported us financially or with product for donations, but the meetings were in the evenings mostly—there were some during the day—but for whatever reasons they did not become involved but they were invited and encouraged.

Thus, while Watershed-C may not have extensive access to social networks, it is still able to find support for some project activities through the networks of project staff.

Bridges to External Networks

Having members that acted as bridges from the watershed group to other organizations or ties also differentiated Watershed-A from the others. While to some degree all of the participants in Watershed-A acted as a bridge between the watershed group and other organizations, one member saw her major role as facilitating information flow. She stated:

I see my role in the watershed group as being a person who has access to local government officials . . . if the watershed group comes in and says, “gee, do this little thing ‘cause it would be nice,” it ain’t going to happen. So I am a link.

There were several outcomes of this individual acting as a bridge. First, she invited another participant from a county government office to take part in the watershed group. The invited participant said, “I was invited by [group member] to come and attend because many of the things that we do [in my job] have an impact on the watershed activities.” Interestingly, the invited participant had previously been involved to a small degree with the group that preceded the current agency driven group, but eventually his participation waned. Aside from becoming a member of the current group, he also helped facilitate several major accomplishments for Watershed-A. As he said:

Well, they were talking about wanting to get the word out to local officials on what the watershed was doing. And so I suggested that they come to the Solid Waste Board. Our members . . . they’re all elected officials: the mayor, city councilmen, all three commissioners . . . I said it’s a great opportunity to come and talk about programs that would make sense to them from a recycling standpoint . . . you don’t have to go to different meetings to catch them all [elected officials].

The group developed a presentation about low-impact development that has been presented to a variety of local elected officials and groups. This can be directly attributed to a group member acting as a bridge between the group and county government. The initial presentation was given because a group member invited a new participant, who in turn set the agenda for the local solid waste management district and was able to schedule the presentation. The group member is bridging a structural hole (Burt 2004) because without her participation the group would not have access to individuals in county government. Participants in Watershed-B and Watershed-C often saw their sole role as attending meetings for the group, not necessarily spreading the word to others or using their position in other organizations to benefit the watershed group.

One of the most interesting phenomena associated with Watershed-A was the extensive use of external social networks for group activities. External networks refer to social ties not involved in the group that were drawn upon in order to accomplish specific tasks. For example, the group had several disagreements regarding a logo for

the organization. Members of the group had attempted to create logos, which were then rejected. A logo was deemed important because the group members wanted to have a brand that could be recognized throughout the watershed. Finally, a participant called upon one of his ties, a professional graphic designer, to help with the logo. As he said, "Well, this friend of mine who I have known for many years . . . I appealed to his weakness, which is clean water, and he did it for free." There is a clear outcome from accessing this tie: the free design of a logo for the group.

In 2006, Watershed-A held its first fall water quality education event for school-children. The event was so successful that the group decided to make it an annual event and sponsored it again in 2007. Group participants drew upon their ties for human capital purposes. One participant stated:

We're very good at scavenging . . . the resources that we need . . . Volunteerism is an absolute necessity for the [event]. I mean, it takes a whole year to plan that, and without the volunteers it couldn't occur. And both days that we have had have been huge successes. So, you know, we're very good at determining what resources we need, where to get them, and sustaining them.

When asked how they found their volunteers, the participant stated, "Well, everybody knows someone through their network. You know, soil and water conservation people, nature center people, environmental education people through the DNR. So there are, gosh, 20 to 30 people out there who do informal education . . . who we can call."

One person, when asked how being active in other organizations contributed to her role in the watershed group, answered, "It really is a good way to network and pull in some new people. Even if they are not in it for the long run, they might be interested in helping you with a special project." The participant's statement exemplifies the way in which external resources were accessed for specific tasks and, as she noted, some of those people became regular participants in the meetings.

Negative Case: Missing Links

While Watershed-A's network resources have contributed greatly to achieving outcomes, some members do feel that there are perhaps some missing links. As one individual stated:

We need to get links over to [nearby county]. There's a chunk of that area in the watershed and we have support from the SWCD office over there, and the urban conservationist, but those individuals were never part of the [watershed group]. That's where I want to make sure that we reach out there to the extent that we . . . can get a bigger bang for our buck.

The participant is discussing the need to coordinate activities with like-minded organizations in order to achieve better water quality outcomes. When asked to elaborate upon the need to form linkages, he said:

Well, we have three or four volunteer groups that are working toward the same goal. But they don't know . . . there is no collaboration. And then

you end up, the obvious thing is that you are both competing for the same grant dollars. From [the state agency] or whatever. And that's not enough: the worst thing is you're competing for volunteers, and that's even more precious . . . I keep saying there should be something in there that would encourage groups to collaborate and work together.

Another individual said, when asked if there were people or organizations she would like to be involved in the group that weren't already,

I don't know. There are so many out there that of course we would like to work with; our missions and goals are the same . . . We don't even know that people are out there doing monitoring in the . . . watershed. Those are groups—we would love to have that data, we would love to know what they are working on, what is coming out of this.

While not directly related to the purposive formation of the Watershed-A internal group, it is very interesting to note that the individual quoted was so driven to develop a means of joining forces with other watershed groups that, over the course of this research, he has obtained funding to organize watershed groups across a region of the state to share information and resources.

Discussion

Watershed-A has expertise and horizontal boundary-spanning networks (Schneider et al. 2003) that assist them with outcome attainment for specific activities. External expertise network ties were called upon often to complete tasks, such as with the logo and water-quality educational events. While the nature of the 319 program dictates some degree of vertical boundary-spanning networks, the group doesn't rely on these ties for attaining outcomes. The group does not, however, have a high degree of ideological boundary-spanning networks. Group members that act as structural bridges have to some extent expanded the ideological network, so that other groups and organizations are aware of Watershed-A's goals. Watershed-A is beginning to raise the awareness of the group across the watershed. Most participants in the group are agency personnel from organizations that have similar missions to manage natural resources effectively, and thus the group is essentially creating more bonding capital consistent with Rydin and Holman's (2004) assertion regarding collaborative groups. Rydin and Holman also state that groups that build bonding, bridging, and bracing capital will experience more success. This is the case in Watershed-A; social resources available through network ties of group members provide the group with unique access to information and assistance that the other groups don't have.

The most important influence on the increasing awareness of the group is the fact that group members have acted as bridges to other organizations. As Burt (2004) stated, "People familiar with activities in two groups are more able than people confined within either group to see how a belief or practice in one group could create value in the other and to know how to translate the belief or practice into language digestible in the target group" (355). Because one group member saw her role as linking the group to county government, there has been an increase in information sharing among different groups.

The local university also has a well-known and positive reputation in the watershed, aiding the group in finding resources. Initially the group was able to gather members to form the watershed group, and subsequently the members were able to complete other actions they needed to carry out. The reputation of the university and the existing ties that staff had with other individuals and organizations in the community also helped to overcome transaction costs, which can often limit group viability. In contrast, both Watershed-B and Watershed-C are more closed, with fewer bridges across structural holes between the groups. Effectively, if a group has any kind of tie, strong or weak, with a position in the social structure that can bridge structural holes, that group will have greater access to information and resources. In both Watershed-B and Watershed-C, the members are less likely to view themselves as being links to other organizations in the community.

None of the watershed groups in this study had an intentionally restricted membership system as described by Dakins et al. (2005). That said, Watershed-A is inherently restrictive given the times that they meet and the lack of meeting advertising. Both Watershed-B and Watershed-C have open policies, but also recognize the need to have representatives (e.g., Watershed-B has guaranteed seats for SWCD advisors). Outcomes achieved in Watershed-A (where the membership system is somewhat restricted) could be perceived to contrast with others who have found open and diverse membership to be a contributing factor to participant perceptions of success (e.g., Selin et al. 2000; Schuett and Selin 2002; Dakins et al. 2005). However, Watershed-A is actually diverse in that the group has representatives from a variety of agencies and organizations. Individuals involved represent groups that are often ideologically similar, but it would be difficult to identify a group or individual who would actively argue against the group's focus of improved water quality.

The focus of this research was on examining how social capital, as network ties that people can access, functions to help groups achieve outcomes. A variety of factors contributed to Watershed-A achieving greater outcomes through networks than the other watersheds. One important point is that the watershed is in a central location with many different organizations nearby, though Watershed-B could potentially draw upon a greater degree of the resources available in its watershed. In Watershed-A, the purposive design of the group led to unique access to different positions in the social structure. While other studies of social capital in collaborative groups have found that individuals participating gain greater insight into the views of other stakeholders and scientific issues thus increasing trust, Watershed-A seemed to have hit the ground running, perhaps because most members have a high degree of water-quality expertise, and they treat group activities as an extension of their job.

Implications

There are several implications of this research. Social structural positions that assist in achieving particular outcomes can be identified for the purposes of watershed groups. In this study, Watershed-A needed to start raising awareness of conservation design principles that the watershed is developing, and a link in county government assisted the members in gaining access to elected officials and other governmental bodies. Based on careful consideration of desired outcomes, watershed groups may be able to more purposively select participants in order to achieve their objectives. For

instance, it may only be necessary to have a group member who has access to local elected officials, if elected officials choose not to participate themselves.

Over time, best practices for building effective social networks for outcome achievement should be developed and disseminated to watershed groups that are seeking or receiving funding for watershed planning and management. Purposively selecting participants in order to have greater access to group members' social capital was a successful strategy in Watershed-A and a useful lesson for other groups. One cautionary note regarding the agency-driven nature of Watershed-A is necessary. Although involvement of agency personnel has led to positive outcomes, it isn't recommended that groups begin to shift their focus to having only agency representatives. A balanced approach to incorporating citizens at large and those affiliated with organizations should be taken. While this is purely speculative, it is possible that more involvement by citizens would have resulted in better outcomes. While there is already a great deal of literature that suggests what stakeholders should be involved in collaborative natural resources management, it bears repeating that community members should be included to promote authentic participation. Encouraging groups to form and access social networks that encompass the vertical, horizontal, expertise, and ideological boundary-spanning networks discussed by Schneider et al. (2003) will provide groups greater access to a variety of network resources and opportunities for information transfer.

An additional recommendation useful for increasing watershed group outcomes is to foster a networking mind set in group participants. Watershed-A experienced some of its outcomes as a result of individuals viewing themselves as links between other organizations or people and the watershed group. It would be very useful if watershed group coordinators and staff were to encourage members to act as bridges among other entities and their watershed group.

Funds available for watershed management may also be used more effectively if state agencies develop a system by which watersheds that are in areas with less access to diverse sources of human capital are linked with watershed groups that have such expertise. A system of mentoring watersheds could be developed that could be used to support new groups or those having trouble achieving objectives. This would require state agencies to identify groups in different geographic regions of each state to serve as the initial resource centers for new groups. Over time, a fuller system of groups would be available to serve as model watersheds. The current study found that the watershed located in an urbanized area had more access to resources than the other two watershed groups. Moreover, the stage of planning/implementation that groups were in was less important than their initial access to resources. Choosing groups to act as resource centers, then, may be more dependent upon degree of urbanization than the time the group has been in existence.

This research also helps to clarify how the concept of social capital can be used and studied in watershed groups receiving 319 funds. Social capital viewed through the lens of resources that can be accessed helps us to more clearly define how group members draw upon social networks for group outcomes.

The focus of this study was limited to groups receiving 319 funds and each group had paid staff at either local agencies or a university. This is an obvious limitation of the transferability of the findings of this study, and future research should examine group outcomes associated with social networks in groups composed primarily of citizens.

Note

1. Prokopy (2008) suggests careful thought be given before disclosing locations where collaborative management is being studied. All interview participants were guaranteed confidentiality, and thus locations will be kept anonymous.

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