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Network Analysis and Stakeholder Analysis in Mixed Methods Research

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In recent years we have witnessed the spreading of the creative uses of network analysis that combine qualitative and quantitative data and analysis. Network methods are used concurrently with or sequentially to ethnography, psychometric techniques, focus groups, simulations, surveys, qualitative interviews, visualization, and data mining, among others (Domínguez & Hollstein, 2014). Such designs contribute to better data quality, increase the data's validity and reliability, improve the understanding of the phenomena studied, reduce the biases and limitations of data collection and data analysis, and make the results more generalizable (Hollstein, 2011, 2014).

The expansion of mixed methods—in social sciences in general and in the field of social network analysis in particular—has coincided in time with a moment in which network analysis is also more popular in the field of community-based research (see Chapter 22; Neal & Christens, 2014). Social network analysis is one of the methods that "capture context" (Luke, 2005, p. 185). Indeed, it is a way of describing the relational properties of the environment; it uses social interaction as a basis, and data are, by definition, contextualized. In this sense, research on sense of community and empowerment, to mention two central concepts in community-based research, can benefit from a relational approach (Maya-Jariego, 2004). Networks provide an integrated vision of the multiple levels that form a community, fit well with respect to researching multiple belongings, and consider, for example, neighborhoods and other clusters not in isolation but in their inmediate context. Another specific application with enormous potential is the evaluation of interorganizational networks as a way of operationally describing community coalitions, that is, as a proxy for community readiness.

In this chapter we will present a mixed methods approach combining network analysis with a community-based participatory research strategy, specifically, stakeholder analysis. In a case study, we shall demonstrate how utilization of this approach resulted in enhancing the involvement of fishing communities in the governance of natural resources.

COMBINING NETWORK ANALYSIS AND ETHNOGRAPHY

Networks can be integrated in mixed methods research designs of a sequential, parallel, or fully integrated nature (Hollstein, 2014). One frequent combination involves (a) surveys of personal networks, or whole network analysis of a section of a community, and (b) ethnographic research. This approach has been followed, for instance, in studies of acculturation of immigrants (Maya-Jariego & Domínguez, 2014), adaptation to new legal procedures in rural China (Avenarius & Johnson, 2014), and innovation networks in global organizations (Gluesing, Riopelle, & Danowsky, 2014).

It is very common for ethnographic fieldwork to be done in a second step, to validate and assist in the interpretation of structural patterns observed in networks. Less frequent is the exploratory use of ethnography, its combination in iterative designs, or the integration of approaches. However, the mix of networks and ethnography usually proves to be a robust combination of standardization and

understanding, breadth and depth, which helps to elucidate the simultaneous dynamics of social structures and actors' cognition. In the next section we explore the combination of network analysis and ethnography in contexts of action research with participatory purposes.

Network Analysis and Stakeholder Analysis in the Governance of Natural Resources

The interest in promoting co-management of natural resources and the emergence of new forms of participatory governance has shifted attention toward community actors. For example, in the case of fisheries there is growing recognition of the value of knowledge and experience that both fishermen and traditional fishing guilds, among other actors, bring to the conservation of fishing stocks and the environment (Bodin & Crona, 2008; Crona & Bodin, 2006, Hogg, Noguera-Méndez, Semitiel-García, & Giménez-Casalduero, 2013). This has resulted in research that, either with an analytical-structural approach or a qualitative approach, has attempted to document the patterns of collaboration and conflict that occur in the exploitation of natural resources (Bodin & Prell, 2011; Sandström, Crona, & Bodin, 2013; Sandström & Rova, 2010a).

The predominant focus in network studies has been on the analysis of interorganizational networks in the management of natural resources (Bodin & Crona, 2009). In the case of fisheries, the network approach has been used to describe the relationship of traditional fishing guilds with fisheries authorities, trade organizations, and wider federations of the fishing industry (Marín & Berkes, 2010). In general, the involvement of the community in decision making seems to improve the management of fishery resources (Gutiérrez, Hilborn, & Defeo, 2011), although occasionally some dynamics of polarization and conflict between sport fishing associations and fishing managers have been observed (Sandström & Rova, 2010b). The sustainable management of natural resources benefits from effective community leadership (Bodin & Crona, 2008; Sandström et al., 2013), decentralization in decision making (Carlsson & Berkes, 2005), and co-responsibility of fishermen and their community settings (Grafton, 2005). From a structural point of view, these processes appear to be supported in network centralization, as well as in a certain level of heterogeneity in the composition of the network (Sandström & Rova, 2010a) and the development of weak ties between members of groups that use different fishing gears (Crona & Bodin, 2006, 2010).

Additionally, the personal networks of skippers, crews, and managers, among others, can provide information on industrial relations and knowledge management in fisheries enclaves or, more broadly, in the fisheries sector. Thus, there have been analyses at the individual level about friendship and kinship patterns, as well as exchanges of advice and social support, in small fishing ports in Kenya (Crona & Bodin, 2006). The most frequent approach has been to use egocentric (that is, pertaining to an individual, who is the "owner" of the network) networks information to create whole networks (Bodin & Crona, 2008; Crona & Bodin, 2010; Sandström et al., 2013).

However, with regard to participatory governance of natural resources, stakeholder analysis is probably the most widely used approach. Stakeholder analysis is a participatory process aimed at understanding socio-environmental systems. It typically involves identifying the key actors of a system, evaluating the corresponding interests of the groups involved, and establishing decision-making priorities (Grimble & Wellard, 1997). Descriptive, normative, and instrumental uses of stakeholder analysis have been distinguished; they are usually developed in a sequence of the three steps of identification, classification, and analysis of the relationships of key actors (Reed et al., 2009). In environmental policies, this strategy has been applied, among other uses, to identifying the most influential actors, facilitating participatory decision making, coordinating groups of organizations, and involving marginalized groups.

Recent experiences have demonstrated the utility of combining these research strategies of network analysis and stakeholder analysis. Prell, Hubacek, and Reed (2009) employed indicators of degree, betweenness, homophily, and tie strength in stakeholder selection for participation in management decisions in the Peak District National Park in the United Kingdom. They thereby avoided a type of selection based only on subjective evaluation, and the importance of communication relationships between actors was recognized. Also, Lienert, Schnetzer, and Ingold (2013) utilized the systematic analysis of stakeholders for delimiting

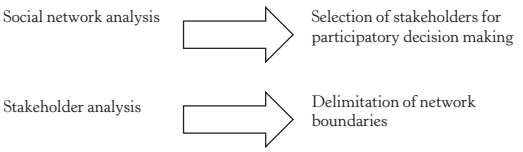

FIGURE 32.1: Two ways of mixing network analysis and stakeholder analysis.

network boundaries, one of the key issues in network analysis, in water infrastructure planning processes in Switzerland. Thus, the two studies differed in the order in which they used the two approaches (see Fig. 32.1). In both examples, each strategy generated complementary results for a better understanding of the socio-environmental system under study.

Communities play an important role in the conservation of natural resources. Therefore, environmental policies have given increasing importance in recent decades to community participation and social cohesion. Specifically, they seek to prevent marginalization of, and conflicts among, groups, as well as to ensure that a diversity of interests is adequately represented in decision making. In this regard, the role of the community is not only to contribute to informed decision making but also to be involved in the management of natural resources and, therefore, to be partners for conservation purposes.

The case of fishing is instructive in this regard. Fishing communities depend on the conservation of fisheries resources. Also, although it is less obvious, community dynamics may affect the viability of natural resources. Overexploitation of marine resources appears when fishermen operate independently, without communication between them, and when the rules of moderation and solidarity are eroded and the ability of collaboration and shared decision making is lost (Jentoft, 2000). For example, setting fishing quotas appears to have altered traditional, collaboration-based modes of relationship between fishermen. Regulations, such as fishing licenses, access limits, and catch quotas, introduce elements of social stratification that modify traditional patterns of organic solidarity (Symes, Steins, & Alegret, 2003). Similarly, the industrial restructuring of the sector changed patterns of relationship, interdependence, and mutual support that had developed over time and that were specific to each fishing community's environment and history.

Thus, the degree of community cohesion in fishing ports has a decisive impact on the conservation of marine natural resources. It is in this context that participatory processes, involving the stakeholder approach, were initiated. In the next section we present a case study where network analysis and stakeholder analysis were applied in parallel, producing insights regarding their joint use in mixed methods research.

CASE STUDY

Background and Aims

The Common Fisheries Policy (CFP) of the European Union establishes a set of regulations for conserving fish stocks. Both co-management of natural resources and participatory governance of fishing fleets seek to ensure that the fishing industry is sustainable and does not threaten the fish population size now and for the future (Regulation [Eu] Nº 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy). This has resulted in the establishment of fishing quotas, the reorganization of industry, and the promotion of artisanal fishing gears. Also, new initiatives to exploit the historic heritage and tourism value of fishing ports and sites have been launched.

In Andalusia, in southern Spain, the regional government is taking action to foster community participation in the fisheries sector in order to respond to the process of industrial restructuring occurring at the European level and to promote new economic and cultural usages with regard to fishing. The extractive activity in Andalusia is distributed among Atlantic and Mediterranean fishing grounds and is located in 35 fishery enclaves. In this context, a multidisciplinary team of researchers from psychology, anthropology, and economics conducted a study to determine the structure of the fisheries sector in Andalusia, as well as to facilitate new forms of organization and participation of fishing guilds, shipowners, crew members, and other industry players.

In this study we combined ethnographic fieldwork (i.e., stakeholder analysis) and social network analysis to describe the most relevant actors and organizations in the fisheries sector in Andalusia, as well as relations between them and the structuring of the sector. Specifically, an extensive inventory of stakeholders was developed, which involved

conducting 322 qualitative interviews in 18 different fishing ports. At the same time, we surveyed the personal networks of a subset of 53 shipowners, crew members, and prominent individuals; finally, we analyzed the interorganizational network of 17 fishing guilds and 13 associations of shipowners in 21 ports. Thus, stakeholder analysis was applied parallel to the structural analysis of relationships at both the individual and organizational levels. Next, we describe the project's three research components.

Stakeholder Analysis

The widest part of the work was to document the relevant actors in the Andalusian fishing ports. For this, the stakeholder technique was developed in four phases. First, an inventory of organizations in each port, with the collaboration of a group of experts, was developed. Second, we classified this set of organizations based on their area of activity and their relative priority in the operation of the port. Third, 322 interviews were conducted with key informants, and the importance and influence of each organization in the process of community participation in the port were evaluated. The level of importance refers to the degree to which a participative governance project would be ineffective if the needs of that particular stakeholder were not taken into account, while influence refers to the relative power that the stakeholder has with respect to monitoring the plan of participation and the extent to which he or she can help or block the changes to be undertaken in the future. Fourth, using all of this information, we held forums in each port, in which stakeholders listed the main problems in each geographical area and made specific suggestions to improve participation in fisheries policy.

An essential feature of stakeholder analysis is that it is based on ethnographic exploration, by means of which we had an opportunity to meet the social actors and institutional agencies in each fishing enclave. Through fieldwork, we could know the relational dynamics between these actors, employing the procedure of selection of ethnographic informants defined by Johnson (1990) as data driven; that is, the experience in the field allowed us to access new significant informants in every social space. Thanks to this system, the relationship of entities initially selected to establish the interorganizational network was complemented with new stakeholders, with both the original and the new stakeholders participating later in forums.

The results of the aforementioned third phase indicated that fishing guilds and shipowner associations stand out in importance and influence above other organizations in the ports, namely, marina management entities, cooperatives of fishermen, aquaculture businesses, producer associations, restaurants, naval stores, canning companies, yacht clubs, sport fishing groups, and environmental organizations. Our findings also indicated that fishing guilds have more relevance and influence than do shipowner associations in the Mediterranean, while fishing guilds and shipowner associations have a more balanced weight in the Atlantic.

Personal Networks

The second component of the research consisted of a survey of personal networks, where a list of 45 alteri (that is, persons to whom a respondent relates) in the port for each of the respondents was obtained, generating a database of 2,385 alteri and 46,310 (out of 104,940 potential) relationships. The a priori establishment of a fixed number of alteri is a procedure originally proposed by McCarty (2002) to ensure a valid and reliable analysis of the structure of personal networks. The strategy of eliciting networks of the same size is an indirect form of standardization of data, which facilitates the comparison of indicators of centrality and other structural properties in samples of personal networks. From a practical standpoint, it facilitates the processing of data, reduces workload, and has proven to be a highly reliable sociometric nomination procedure. Furthermore, it has been empirically found that 30 or more alteri are sufficient to capture the diversity of personal network structures. In our case, in addition to information about who was related to whom (45 x 45 matrices) in each personal network, respondents were asked about the professional roles exercised in the port by each of the 45 alteri.

The next step was to summarize this information using a clustered graphs method, which is a strategy for visualizing personal networks through grouping the links into intra- and interclass relationships (Brandes, Lerner, Lubbers, McCarty, & Molina, 2008). In our study, for classification purposes we used the eight most relevant professional categories in the sample of alteri, namely crew members, skippers, shipowners, services,

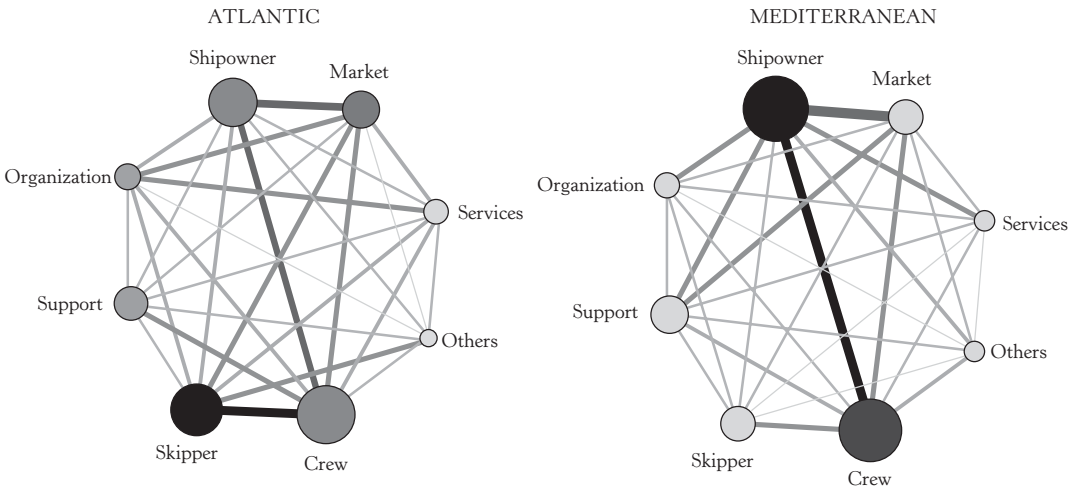

FIGURE 32.2: Clustered graphs of personal networks in the Atlantic and Mediterranean fishing sectors.

market, organization, support, and others. These are the most common activities in the harbor (Maya-Jariego, Holgado, & Florido, 2015). We generated two metarepresentations of the personal networks of respondents in the Atlantic (n = 26) and the Mediterranean (n = 27) fishing grounds (for methodological details, see Maya-Jariego, Holgado, & Florido, 2015). The results are shown in Figure 32.2. The weights of the intragroup relationships are represented by the color intensity of each node, while the weight of intergroup relationships is reflected in the size of each link. On the other hand, the size of each node, also on a weighted basis, shows the proportion of each professional category in the fishery concerned.

The results indicated a greater differentiation of professional roles in the Atlantic than in the Mediterranean fishing grounds. In the Atlantic, where industrial fishing predominates, relationships are more evenly distributed between the eight professional categories, and there is a clear differentiation between the roles of skipper and shipowner. The functions of management and direction of the boat are frequently performed by different people. On the other hand, in the Mediterranean, relationships are clearly focused on the link between shipowners and crew members. In this latter fishery zone, where artisanal fisheries clearly prevail, the owner of the boat usually goes fishing daily; that is to say, he works as a captain while also assuming management responsibilities. It is a less complex and smaller scale fishing ground, where fishing is organized around boats and informal relationships.

Therefore, the detailed analysis of relations demonstrates the existence of two patterns of sociability differentiated according to the fishing ground. This has consequences both in the way in which each fishery organizes labor relations and social participation and in the transformations required by the new fisheries policies and the restructuring of the sector. The small Mediterranean ports seem better prepared to adapt to a context in which the catches are limited and new tourism and heritage usages are promoted. In contrast, the organizational complexity of the Atlantic fishing ground will likely result, in practice, in a process of industrial restructuring, in which the greater polarization of relations will probably carry a higher incidence of labor unrest. Traditional fishing guilds are likely to continue to emerge as key players in this process both in the Atlantic and the Mediterranean.

Organizational Networks

We also analyzed the interorganizational network of 30 fishing guilds and associations of shipowners in Andalusia. We interviewed a representative of each organization. Respondents were selected based on their experience and position in the organization. In most cases, it was the skipper or the secretary in the fishing guilds, and the president or manager in shipowner associations. Specifically, four types of relationships were evaluated: acquaintanceship networks, interpersonal relationships, joint participation in meetings of the fishing sector, and co-management of fishing issues. The first three are informal relations that emerge in contexts

of sociability in the ports, such as the cafeteria, nautical shops, or the rooms of the shipowners, which usually serve as a meeting point. However, co-management is a type of institutionalized relationship that depends more heavily on the initiative of govenment agencies and other regulatory bodies. Unlike the study of personal networks, in this case we did not conduct a sampling but rather a thorough fieldwork for collecting information, with all the guilds and associations of shipowners, to trace the complete interorganizational network.

The organizational network of fisheries in Andalusia forms a core-periphery structure, is clearly differentiated by fishing grounds, and is organized around a central core of guilds (see Fig. 32.3). Specifically, four guilds have the highest scores in prominence, centrality, and intermediation and are part of the core in the core-periphery structure of the four networks analyzed (Maya-Jariego, Holgado, Florido, & Martínez, 2015). These four guilds have a role of representation in the regional federations and are also located in ports with the greatest amount of fishing.

Two factors—the type of organization and the fishing ground—showed a significant influence on the formation of relationships. The analysis of the network, using the E-I Index and Constant Homophily procedure of the UCINET program,

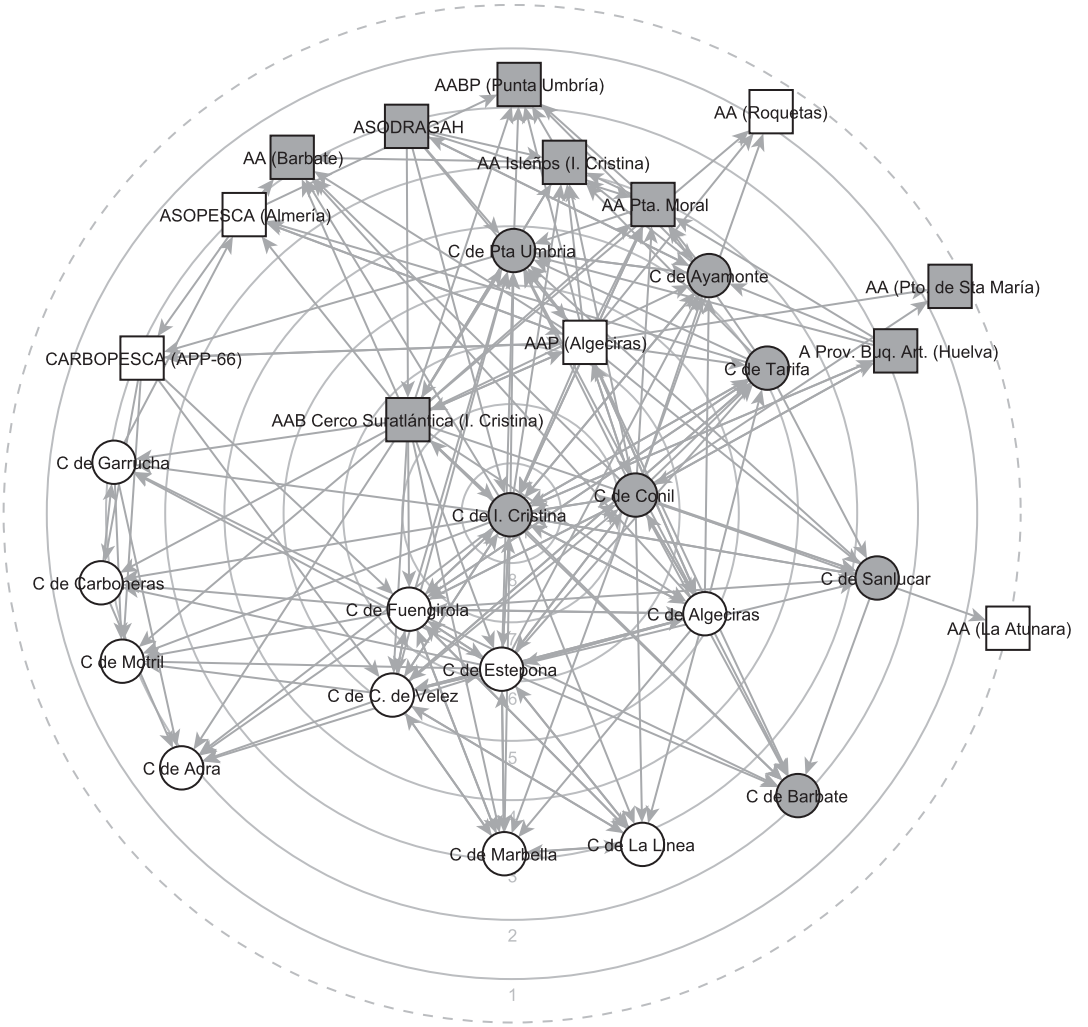

FIGURE 32.3: Interorganizational network of fishing in Andalusia. The position of the nodes is based on degree of centrality (concentric circles). White nodes represent Mediterranean organizations, and gray nodes represent Atlantic organizations. Circles represent guilds, and squares represent shipowners.

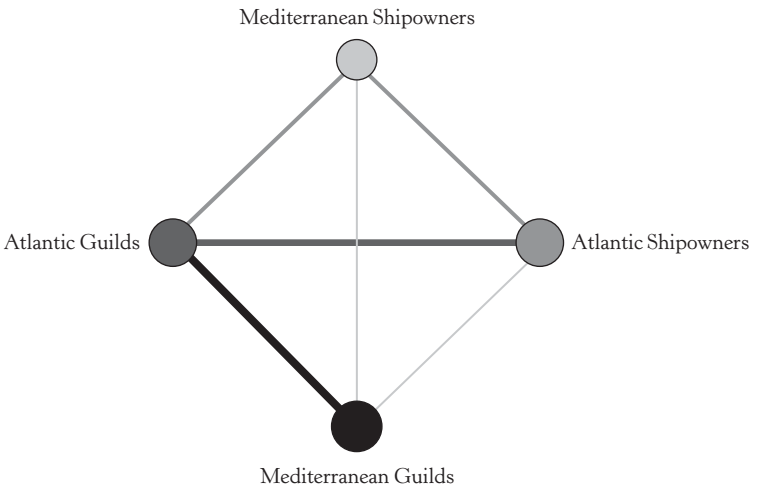

FIGURE 32.4: Clustered graph of the interorganizational network of the Andalusian fisheries.

demonstrated the existence of homophilic relations depending on the type of organization and, to a lesser extent, depending on the fishing ground. Employing the Joint-Count test, we found that the greater relative weight of intragroup relations is found in fishing guilds (if we refer to the type of organization) and in the Atlantic (if we refer to fishing grounds) (Maya-Jariego, Holgado, Florido, & Martínez, 2015).

We summarized this information with clustered graphs. Figure 32.4 shows the two joint axes of the Andalusian fisheries: the relationships between guilds and the projection of the Atlantic fishery. With respect to local harbor life, in the Mediterranean the fishing guilds are most relevant (that is, more central, better connected, and with more relative weight), with the shipowners having a secondary role. It is a context of artisanal fisheries, where the fishing enclaves organized around a guild are frequent. However, at the regional level, the guilds of the Atlantic have more prominence in the social network with respect to governance patterns. The Atlantic is characterized by the distribution of power between the guilds and shipowner associations. The industrial character, along with increased organizational complexity, is reflected in a greater differentiation of labor relations.

In summary, first, stakeholder analysis guided us to focus on fishing guilds and shipowner associations from among a variety of organizations in the ports. Second, interorganizational network analysis confirmed the observations from stakeholder analysis and the personal networks survey; namely, the Atlantic and Mediterranean fishing sectors have different structures in the relationships among key players, at both the individual and the organizational levels. Locally, fishing guilds are more central in the Mediterranean, while at the regional level Atlantic guilds have a key role in articulating the Andalusian fishing sector.

CONCLUSION

In this chapter we have attempted to demonstrate how stakeholder analysis and social network analysis can be used in parallel or as part of a sequential design, resulting in more, and more useful, information than either approach alone. For example, obtaining indicators of centrality, as well as the description of the properties of the network, *before* stakeholder analysis helps to identify key actors, providing systematic information and analytical accuracy. However, structural techniques can also be applied *after* ethnographic fieldwork has served to define, in a relevant and adapted-to-the-context manner, the network boundaries or has produced a census of actors useful for personal networks surveys.

Stakeholder analysis has considerable potential for identifying significant behaviors settings, through descriptive and exploratory study of the contexts of sociability, which improves the relevance of network analysis. Stakeholder analysis organizes the actors into categories, benefiting from previous substantive knowledge of the socio-environmental system under study. The

classification and prioritization of the actors enable the researcher to study networks of subsets of actors or use the list of stakeholders for sampling. It is useful for defining the network pragmatically, and this detailed information on the population reduces the problem of accessing respondents and indirectly also reduces the percentage of missing data. Stakeholder analysis is very sensitive to institutional dynamics, making it complementary to the relational content on which network analysis usually focuses. Finally, it also appears to be quite sensitive to the determination of relevant actors in the function of the issues.

Social network analysis completes the description of the interests of the different actors, with consideration of structural, positional, and relational aspects. In an area where the indicators of prominence and functional differentiation of the actors have dominated, it introduces a fine-grained analysis of the roles that individuals and organizations deploy in the environmental policies scenario. Some of its contributions involve identification of leaders, mediators, and local interlocutors in different clusters of the network; operational description and classification of different patterns of collaboration; and detection of potential for innovations on the periphery of the network. The structural properties of the network may serve as the basis for an evidenced-based catégorization, supplementing the ratings derived from the subjective interpretation of stakeholders and experts (Boschetti, Richert, Walker, Price, & Dutra, 2012).

In addition, visualization of graphs is a catalyst for working with stakeholders. Besides communicating the properties of the network, it is in practice a form of intervention. Sometimes, when one provides feedback on the relationships of a set of actors through graphical representation, one can generate positive dynamics of engagement and participation, as well as efforts of actors to be nearer the core in a core-periphery structure (Molina, Maya-Jariego, & McCarty, 2014). In fact, the netmap technique, usually applied for identifying leaders and key players in a community during the implementation of cooperation for development projects, consists of a combination of qualitative interviews, maps of relationships, and group debates to interpret the sociograms (Schiffer, 2007). The visual display of networks helps participants to collaborate in resource mobilization and in consensus building. Thus, it is an appropriate way to reflect on a specific sector and implement community development initiatives.

We have attempted to demonstrate in this chapter that social network analysis contributes more than just centrality indicators and other measures. Beyond the enumeration of who are prominent actors, networks provide structural insight into the study and involvement of stakeholders. As we have seen with the case study, we can naturally deduce actions to improve network governance. Among others, we can launch operations to modify the network structure, arrange the context of relationships, and facilitate new forms of organization (Sandström et al., 2013). For example, in the case of fisheries in Andalusia, with the use of network information we could potentially form coalitions of fishing guilds and shipowners in the two fishing grounds, prepare the conditions for joint participation at the regional level, prevent exclusion of peripheral organizations of the Mediterranean fishing ground, mediate in cases of local conflict, and promote common agreements to address the restructuring of the sector.

The application of network analysis to the sustainable management of natural resources is an emerging field with considerable potential. Undoubtedly, in the coming years we will see new and exciting developments in the combination of structural analytics, such as network analysis, and community-based participatory research, such as stakeholder analysis, in this and other areas.

AUTHOR NOTE

Support for this research was provided by the Consejería de Fomento y Vivienda de la Junta de Andalucía (the equivalent of the Ministry of Public Works and Housing of the regional government of Andalusia, Spain). The study of networks and stakeholders is part of a wider project on fishing governance in Andalusia: "Dinamización de los Enclaves Pesqueros en el Sistema Portuario Andaluz: Usos Económicos, Gobernanza y Patrimonialización" [Revitalization of Fisheries Enclaves in the Andalusian Port System: Economic Uses, Governance and Patrimonialization] (2013–2015) (CP-2043/0073, GGI3001IDI0).

REFERENCES

Avenarius, C. B., & Johnson, J. C. (2014). Adaptation to new legal procedures in rural China: Integrating survey and ethnographic data. In S. Dominguez

& B. Hollstein (Eds.), *Mixed methods social networks research* (pp. 177–202). New York, NY: Cambridge University Press.

Bodin, Ö., & Crona, B. (2008). Management of natural resources at the community level: Exploring the role of social capital and leadership in a rural fishing community. *World Development, 36*, 2763–2779.

Bodin, Ö., & Crona, B. (2009). The role of social networks in natural resource governance: What relational patterns make a difference? *Global Environmental Change, 19*, 366–374.

Bodin, Ö., & Prell, C. (2011). *Social networks and natural resource management. Uncovering the social fabric of environmental governance*. New York, NY: Cambridge University Press.

Boschetti, F., Richert, C., Walker, I., Price, J., & Dutra, L. (2012). Assessing attitudes and cognitive styles of stakeholders in environmental projects involving computer modelling. *Ecological Modelling, 247*, 98–111.

Brandes, U., Lerner, J., Lubbers, M. J., McCarty, C., & Molina, J. L. (2008, March). *Visual statistics for collections of clustered graphs*. Paper presented at 2008 IEEE Pacific Visualization Symposium, Kyoto, Japan.

Carlsson, L., & Berkes, F. (2005). Co-management: Concepts and methodological implications. *Journal of Environmental Management, 75*, 65–76.

Crona, B., & Bodin, Ö. (2006). What you know is who you know? Communication patterns among resource users as a prerequisite for co-management. *Ecology and Society, 11*, 7.

Crona, B., & Bodin, Ö. (2010). Power asymmetries in small-scale fisheries: A barrier to governance transformability? *Ecology and Society, 15*, 32.

Domínguez, S., & Hollstein, B. (Eds.). (2014). *Mixed methods social network research: Design and applications*. New York, NY: Cambridge University Press.

Gluesing, J. C., Riopelle, K. R., & Danowski, J. A. (2014). Mixing ethnography and information technology data mining to visualize innovation networks in global networked organizations. In S. Dominguez & B. Hollstein (Eds.), *Mixed methods social networks research* (pp. 203–236). New York, NY: Cambridge University Press.

Grafton, R. Q. (2005). Social capital and fisheries governance. *Ocean and Coastal Management, 48*, 753–766.

Grimble, R., & Wellard, K. (1997). Stakeholder methodologies in natural resource management: A review of principles, contexts, experiences and opportunities. *Agricultural Systems, 55*, 173–193.

Gutiérrez, N. L., Hilborn, R., & Defeo, O. (2011). Leadership, social capital and incentives promote successful fisheries. *Nature, 470*, 386–389.

Hogg, K., Noguera-Méndez, P., Semitiel-García, M., & Giménez-Casalduero, M. F. (2013). Marine protected area governance: Prospects for co-management in the European Mediterranean. *Advances in Oceanography and Limnology, 4*, 241–259.

Hollstein, B. (2011). Qualitative approaches. In J. Scott & P. J. Carington. *Sage handbook of social network analysis* (pp. 404–416). London, England: Sage.

Hollstein, B. (2014). Mixed methods social network research: An introduction. In S. Dominguez & B. Hollstein (Eds.), *Mixed methods social networks research* (pp. 3–34). New York, NY: Cambridge University Press.

Jentoft, S. (2000). The community: A missing link of fisheries management. *Marine Policy, 24*, 53–59.

Johnson, J. C. (1990). *Selecting ethnographic informants*. Newbury Park, CA: Sage.

Lienert, J., Schnetzer, F., & Ingold, K. (2013). Stakeholder analysis combined with social network analysis provides fine-grained insights into water infrastructure planning processes. *Journal of Environmental Management, 125*, 134–148.

Luke, D. (2005). Getting the big picture in community science: Methods that capture context. *American Journal of Community Psychology, 35*, 185–200.

Maya-Jariego, I. (2004). Sentido de comunidad y potenciación comunitaria. *Apuntes de Psicología, 22*, 187–211.

Maya-Jariego, I., & Domínguez, S. (2014). Two sides of the same coin: The integration of personal network analysis with etnographic and psychometric strategies in the study of acculturation. In S. Dominguez & B. Hollstein (Eds.), *Mixed methods social networks research* (pp. 153–176). New York, NY: Cambridge University Press.

Maya-Jariego, I., Holgado, D., & Florido, D. (2015). *Clustered graphs of worker roles in Atlantic versus Mediterranean fishing enclaves: Ready for artisanalization in Andalusia?* Manuscript submitted for publication.

Maya-Jariego, I., Holgado, D., Florido, D., & Martínez, I. (2015). *Redes entre dos mares: Relaciones entre cofradías y asociaciones de armadores en los caladeros Atlántico y Mediterráneo de Andalucía* [Fishnets between two seas: Relationships between guilds and associations of shipowners in the Atlantic and Mediterranean fishing grounds of Andalusia]. Revista Española de Investigaciones Sociológicas (REIS).

Marín, A., & Berkes, F. (2010). Network approach for understanding small-scale fisheries governance: The case of the Chilean coastal co-management system. *Marine Policy, 34*, 851–858.

McCarty, C. (2002). Structure in personal networks. *Journal of Social Structure, 3*(1).

Molina, J. L., Maya-Jariego, I., & McCarty, C. (2014). Giving meaning to social networks: Methodology for conducting and analyzing interviews based on personal network visualizations. In S. Dominguez & B. Hollstein (Eds.), *Mixed methods social networks*

research (pp. 305–335). New York, NY: Cambridge University Press.

Neal, J. W., & Christens, B. D. (2014). Linking the levels: Network and relational perspectives for community psychology. *American Journal of Community Psychology, 53*, 314–323.

Prell, C., Hubacek, K., & Reed, M. (2009). Stakeholder analysis and social network analysis in natural resource management. *Society and Natural Resources, 22*, 501–518.

Reed, M. S., Graves, A., Dandy, N., Posthumus, H., Hubacek, K., Morris, J., . . . Stringer, L. C. (2009). Who's in and why? A typology of stakeholder analysis methods for natural resource management. *Journal of Environmental Management, 90*, 1933–1949.

Sandström, A., Crona, B., & Bodin, Ö. (2013). Legitimacy in co-management: The impact of preexisting structures, social networks and governance strategies. *Environmental Policy and Governance, 24*, 60–76.

Sandström, A., & Rova, C. (2010a). Adaptive co-management networks: A comparative analysis of two fishery conservation areas in Sweden. *Ecology and Society, 15, 14*.

Sandström, A., & Rova, C. (2010b). The network structure of adaptive governance: A single case study of a fish management area. *International Journal of the Commons, 4*, 528–551.

Schiffer, E. (2007, May). *Net-map toolbox: Influence mapping on social networks*. Paper presented at the XVII Sunbelt Conference of the International Network of Social Network Analysis, Corfu, Greece.

Symes, D., Steins, N., & Alegret, J. L. (2003). Experiences with fisheries co-management in Europe. In D. C. Wilson, J. R., Nielsen, & P. Degnbol (Eds.), *The fisheries comanagement experience: Accomplishment, challenges, and prospects* (pp. 119–134). Dordrecht, The Netherlands: Kluwer Academic Press.