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## Relational capital in fishing communities: the case of the “Stretto” Coast FLAG area in Southern Italy

Monica Palladino<sup>a,\*</sup>, Carlo Cafiero<sup>b</sup>, Claudio Marcianò<sup>a</sup>

<sup>a</sup>*Agraria Department, Università Mediterranea, Feo di Vito, 89100 Reggio Calabria, Italy*

<sup>b</sup>*Food and Agriculture Organization of the United Nations, viale delle Terme di Caracalla, 00153 Rome, Italy*

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### Abstract

Given the importance of the role assigned to social relations and the exchange of information in the theory that subsumes the latest EU Development Policy planning for 2007-2013, this study analyses the “Stretto” Coast FLAG fishing community, in Southern Italy, from the perspective of the “relational capital” it possesses. The analysis aims at highlighting the quality and intensity of the relationships that exist among fisherfolk and that are of relevance for their professional activities. The study is conducted by integrating qualitative research with elements of quantitative Social Network Analysis. The hypothesis is that the relatively limited effectiveness of current local development initiatives might be partly due to too much isolation and limited information flow among the actors involved. If true, reducing isolation and increasing information flows might contribute to increase the effectiveness existing and future policies. In turn, this would increase the efficiency of use of the limited financial resources devoted to fishery development and, more generally, to the social and economic local development by empowering local actors in finding solutions to existing problems in an area that remains, from many points of view, still problematic.

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\* Corresponding author. Tel.: +39-06-635802; fax: +39-06-635802.  
*E-mail address:* [monicapalladino@hotmail.com](mailto:monicapalladino@hotmail.com)

## 1. Introduction

In the context of the EU Common Fishery Policy<sup>1</sup>, the five priority Axes European Fishery Fund (EFF)<sup>2</sup> introduced important measures in support of fishery and aquaculture. An integrated set of such measures requires the concerted action of the several public and private actors to support specific animation activities to strengthen the centrality of coastal areas, while promoting synergies with other existing funds for development. One of the EFF innovations is Axis 4, which has been interpreted as the equivalent of a LEADER initiative for fishery, as it is inspired by the model of Local Action Groups (LAG) developed within EU Rural Development policy<sup>3</sup>. The introduction of Fishery Local Action Groups (FLAGs) highlights how also in the fishery sector it is imperative to determine which development actions are more appropriate from a bottom-up perspective, i.e., by listening and responding to local requests, of essence for the development of Local Development Plans (LDP).

In accord with the principles set out with the EFF, the “Stretto” Coast Fishery Local Action Group (hereafter FLAG) was established in 2012 and started operating in 2013, covering seven municipalities along the Tyrrhenian coast of the Province of Reggio Calabria in Southern Italy (Marcianò, Romeo, & Cozzupoli, 2015), an area where several socio-economic partnerships are active (Marcianò & Palladino, 2013).

Given the importance of the role assigned to social relations and the exchange of information in the theory that subsumes the EU Development Policy, this study analyses the fishing community of the FLAG from the perspective of the “relational capital” it possesses. By relational capital we mean the net of links, acquaintances, human and professional relations that, when adequately supported, allow a more efficient and effective economic activity.

The analysis aims at highlighting the quality and intensity of the relationships that exist among the operators in the area, focusing on those that are of relevance for their professional activities. A study of any economic activity, even of a single firm, cannot be devoid of considering the relationship that each enterprise maintains the others and with a number of other economic characters playing varying roles of direct and indirect support. For this reason, the study is conducted by integrating qualitative research with elements of quantitative Social Network Analysis (SNA). The use of SNA tools in this research has allowed identification of the main subjects, both private and public, individual or group, of the fishery system in the area, and of their potential role, competencies and actions in keeping the sector viable. In preparation for the network analysis proper, a series of field inquiries has allowed the collection of evaluations and opinions directly from the operators interviewed. These data are used to quantify the intensity of relations and the tightness of the network, by possibly identifying also the presence of “isolated” actors. (Palladino, Cafiero, & Marcianò, 2016).

The hypothesis is that the relatively limited effectiveness of current local development initiatives might be partly due to too much isolation and limited information flow among the actors involved. If true, reducing isolation and increasing information flows might contribute to increase the effectiveness existing and future policies. In turn, this would increase the efficiency of use of the limited financial resources devoted to fishery development and, more generally, to the social and economic local development by empowering local actors in finding solutions to existing problems in an area that remains, from many points of view, still problematic.

## 2. Description of the study area

The FLAG involves actors from the municipalities of *Bagnara Calabria*, *Gioia Tauro*, *Palmi*, *San Ferdinando*, *Scilla*, *Seminara* and *Cannitello of Villa San Giovanni*. The study area includes, in particular, the ports and fishing communities of Gioia Tauro, Bagnara Calabria, Palmi, Scilla and Cannitello. The official EU Community fishery fleet register<sup>4</sup> lists 143 fishing vessels recorded in the study area, listed in Table 1 by port and by type of gear.

<sup>1</sup> Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC

<sup>2</sup> Council Regulation (EC) No 1198/2006 of 27 July 2006 on the European Fisheries Fund.

<sup>3</sup> Council Regulation (EC) No. 1698/2005

<sup>4</sup> <http://ec.europa.eu/fisheries/fleet/index.cfm>

The local economy of *Bagnara Calabria*, the largest fishing community in the area, is still strongly dependent on fishing, especially of swordfish. Despite the presence of a non-negligible touristic sector, the local harbor's capacity is pretty much fully occupied by fishing boats. Since the ban of the “spadara” net, the most pressing issue in the area is how to allow for a smooth conversion of the enterprises who used to use them towards other fishing gears. (Palladino, 2015).

The second larger fishing fleet in the area is that of *Palmi*, with 33 fishing boats registered in the public archive. The prevailing system is based on nocturnal use of purse seines, operated through the “lamparas”, relatively small fishing boats based in the *Tonnara* harbor. Next, in terms of number of registered boats, is *Gioia Tauro*, with 22 boats, 11 of which are relatively larger trawling boats. (Palladino, 2015).

Table 1. Composition of the fishing fleet in the study area, by port and by main fishing gear

	Set longlines	Set gillnets (anchored)	Purse seines	Drift nets	Bottom otter trawls	Total
Bagnara Calabria	17	1	29	1	18	66
Palmi	3	3	25	2	-	33
Gioia Tauro	9	-	2	-	11	22
Scilla	10	1	5	1	-	17
Villa San Giovanni	1	1	3	-	-	5
Total	40	6	64	4	29	143

Source: EU Community fishing fleet register

With only 17 boats registered in the public record, *Scilla* is renowned mainly for the typical swordfish “hunting”, done with the “*passerella*” or “*feluca*”, a traditional boat with a crew that includes a steersman, a spotter and a harpooner. The steersman and the spotter work by standing on top of the “*antenna*”, a tower up to 15 to 25m tall. The harpooner acts by walking at the end of the “*passerella*”, a long suspended bridge extending from the bow of the boat, from where he harpoons his target, usually with a single stroke. By its nature, it is a highly selective method of fishing, and therefore highly sustainable from an environmental point of view. In addition to swordfish, preys may include billed spearfish. According to the people we interviewed, however, swordfish hunting with the “*passerella*” – once a dominant activity – is no longer sustainable from an economic point of view. The only five surviving *felucas* (from more than 20 existing in the area up to only 10 years ago) continue to operate despite the high operating costs and low returns, mainly because this activity represents for them a strong element of their social identity. (Palladino, 2015).

Last in terms of fleet size is *Villa San Giovanni* with only five boats.

### 3. The questionnaire and the sample

#### 3.1. The questionnaire

An original questionnaire was designed specifically for this research. It is composed of five sections, only two of which relevant for the analysis presented here. The first section collects information on the characteristics of the person interviewed and of his or her fishing activity (type of boat, gear, crew size, etc.), information used to define the exogenous attributes of the nodes in the network. The second section is the largest one. It contains questions aimed at collecting the information needed to characterize the links in the network, that is, the type of relationship that each interviewed entertain with colleagues in the area. A first set of questions aims at revealing acquaintances, whether or not there is an exchange of information, and what kind of information is exchanged among fishermen. A second set of questions, based on a five-item Likert scale, aims at determine the degree of “trust” the interviewed has towards those with whom information is exchanged.

Table 2. Composition of the sample

	Availability			Not Contacted	Total
	Full	Limited	None		
Bagnara Calabria	10	11	16	25	62
Palmi	7	0	0	24	31
Gioia Tauro	4	0	0	15	19
Scilla	4	0	1	7	12
Villa San Giovanni	1	0	0	3	4
Total	26	11	17	74	128

Source: Palladino, Cafiero, & Marciandò, 2016

### 3.2. The sample

The selection of the interviewed was based on a preliminary review of the fleet and the ports, aimed at trying to identify the owners or managers of the registered boats and those among them who were willing to collaborate in the research.<sup>5</sup> Of the 143 registered boats, 15 were excluded, as they were not present in the ports, either because been withdrawn from activity or because they were operating for extended periods in other areas. The effective size of the study population is therefore of 128 vessels. The preliminary review allowed contacting the holders or skippers of 54 of them. Of these, 26 declared full availability for the interview, 11 some availability and 17 refused to grant any interview. In the end, the skippers of 26 vessels have been interviewed, covering all five ports (Table 2).

## 4. Analytic Method

The study presented here is part of a larger study that aims at analyzing the fishery system in the FLAG through the identification of the main actors (fishing enterprises, institutions and organizations) who, with different roles, are engaged in economic activities directly or indirectly linked to fishing. The variety of actors involved, suggests the presence of a multi relational structure (see Morone, Sisto, & Taylor, 2004) in the social network representing the system, as there may be different kinds of exchanges (of goods and of information), operating at different levels (formal and informal), determining the socio-economic relationship. It is for this reason that an analysis of the nature of the relationships existing among actors, in addition to the simple description of their structure, will allow for a better and more complete view of how the fishery system in the area works. Here we focus on the analysis of the relations of acquaintances, trust and information flow that exist among fishermen. The study uses analytic tools provided by the branch of social research called *Social Network Analysis* (SNA), the study of networks made of “actors” (or “nodes”) and “relationships” (or “links”). From such a perspective, the social network in itself, in addition to the single actors or functions, represents a unit of analysis.

### 4.1. Social Network Analysis

Social Network Analysis is a branch of quantitative social research focusing on the existence, type and strength of relationships among actors (Wassermann & Faust, 1994). Adequately representing a social network calls for the specification of relevant characteristics of the relationships and of attributes of the actors. Relevant attributes of the actors can be classified as exogenous, meaning that they are independent from the relationships they maintain with other actors (e.g., age, sex, education, etc.) or endogenous, when they are determined by the type and intensity of the

<sup>5</sup> Public fleet register data do not reveal the names of boats' owners. An effective way to identify the actors proved to be the use of the names and of some of the main characteristics of the boats. To preserve anonymity, the 26 interviewed are referred to here by fictional names inspired by the Assyrian history and mythology.

relationships (e.g., “centrality”, “betweenness”, etc.). Proper definition of the attributes is crucial to understand how a social network “functions” and to aid in the interpretation of the socio-economic phenomena associated with it, especially when the social network analysis is used in support of planning and forecast analyses.

Exogenous attributes are based on information directly collected through the questionnaire, while endogenous ones are the results of the analysis of the data on the relationships, usually organized as matrices, leading to the computation of synthetic indices that summarize the way in which each actor interacts with the others. Various analytic models in support of SNA allow the study of the characteristics of the network as a whole, the characteristics of each actor, and of how the two group of characteristics are related to each other. Most of the analysis is conducted through graphical visualization of the network, where nodes and links are represented in different ways also based on the results of statistical analyses of nodes and links’ attributes, more or less sophisticated depending on the scope of the analysis and the degree of uncertainty in the available information.

4.2. Types of networks and relevant indices used in this analysis

Given the type of data collected, where each of 26 interviewed actors reported on the relationships they maintain with the other 127 active fishermen in the area, two types of networks could be constructed. “One-mode” networks could be formed to explore the relationships among the 26 fishermen interviewed. Here, each node represent an actor that has been interviewed and the links represents the (possibly reciprocal) relations among them. In a “two-mode” network, links might represent the relationships that each of the 26 interviewed declares to maintain with the 101 who have not been interviewed. Obviously, links cannot be reciprocal in that case. Different networks can also be created to describe the information collected with the different questions in the questionnaire. Simple networks of “acquaintances” are based on the information of whether or not fishermen have declared to be acquainted with others. In the “informational” networks, links represent the declared presence of an active exchange of information between the two nodes; information exchanged can be of a “technical” or of a “managerial” nature. Finally, “trust” networks are constructed based on the declared degree of trustworthiness that each interviewed has associated with the others. The degree of trust has been reported on a five levels Likert scale, going from very low to very high, thus allowing for the definition of “negative” trust (levels 1 and 2) and of “positive” trust (levels 4 and 5).

In total, the data collected offers the opportunity to create 10 different networks, as summarized in Table 3.

Table 3. Typology of social networks used in this study and associated labels

	“acquaintance”	“information”		“trust”	
		“technical”	“managerial”	“positive”	“negative”
One-mode	<b>A1</b>	IT1	<b>IM1</b>	<b>TP1</b>	<b>TN1</b>
Two-mode	A2	IT2	IM2	TP2	TN2

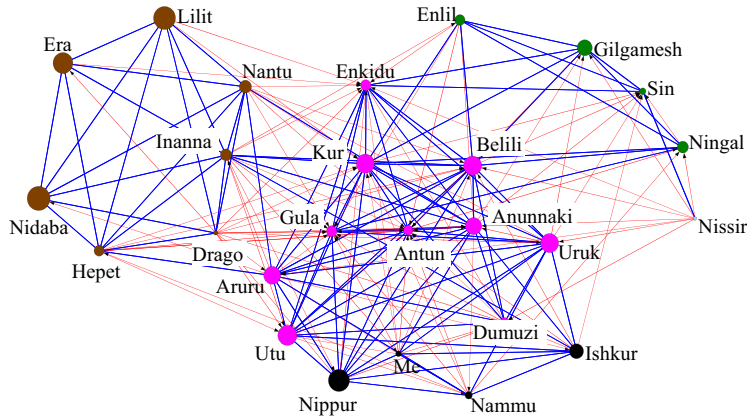
This article discusses preliminary results based on the analysis of the one-mode networks highlighted in bold in the table. In all networks, links are directional: a link from node “A” to node “B” signifies that actor A has declared to be acquainted with actor B. To aid in the visual analysis of the networks, node colors, shapes and size are based on relevant node attributes, while link colors represent, when relevant, reciprocity of the link.

5. Results

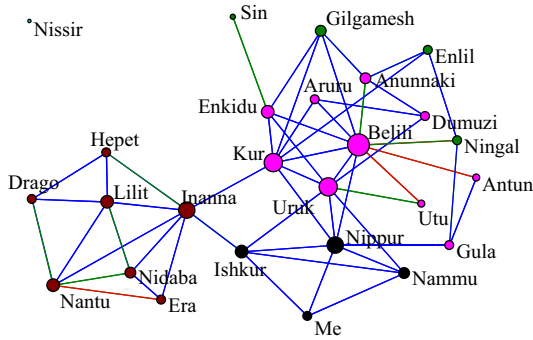
One of the key results of Social Network Analysis (SNA) is the identification of the most relevant actors within a group or community, those who occupy strategic positions. Two indexes are particularly useful for this: the “degree” and the “betweenness” of a node. The “degree” of a node in a network is defined as the number of links it has. (Wasserman and Faust, 1994). When links are directional, both the “outdegree” and “indegree” of a node can be defined as the number of links respectively originating from or reaching a node. In the context of the one-mode network of “acquaintances” A1, we compute an index of “popularity” for any node in the network, as the ratio

between the indegree and the outdegree of the node. A high value of the index identifies an actor who is “popular” in the sense that (s)he is known by more people in the group than those (s)he knows directly.

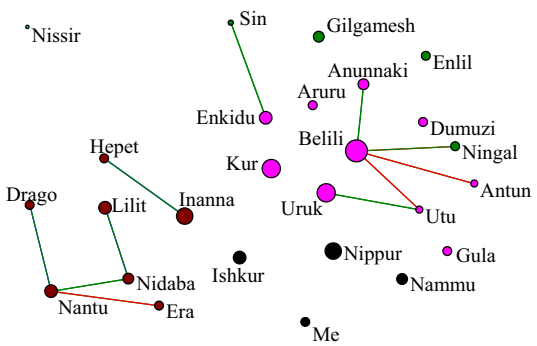
(a)



(b)



(c)



(d)

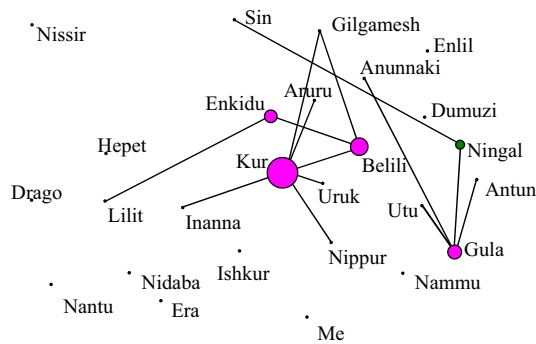


Fig. 1 (a) one-mode network of acquaintances (blue lines indicate reciprocal links; node size is based on the reciprocity index); (b) one-mode networks of trust (only coherent links are represented; blue lines indicate positive, green lines neutral and red lines negative trust; node size based on degree); (c) one mode network of trust (neutral or negative); (d) one-mode network of managerial information exchange (node size is based on betweenness).

The “betweenness” of a node is a measure of the possible “structural advantage” possessed by an actor in a social network for occupying an intermediate position between two or more other subjects. Such a position might confer power to the holder, to extent that it allows control of information flows. (Hanneman & Riddle, 2005). Because of the non-random selection of the sample of respondents in this analysis, special attention has been devoted to the assessment of the reliability of the responses they give, in order to be confident on the possibility of extending the conclusions to the entire area of investigation. Through appropriately defined indices, we measure the extent of reciprocity in the statements regarding the acquaintance of any pair of actors in the one-mode network, and the degree of consistency between levels of trust expressed from one towards the other member of the pair.

### 5.1. Who knows whom?

The “acquaintance” network among the 26 interviewed fishermen is quite dense, with links connecting them also across the different ports (represented by different colors of the nodes). Of the 325 theoretical possibly existing links, 187 have been declared (58% of total). Of these, 103 (or 55%) are reciprocal, indicated by the blue lines in the graph (a) of Fig. 1.

Node size in the graph is set in terms of a “reciprocity index” defined as the proportion of links that are reciprocal. The index has a theoretical maximum value on one, when all links are reciprocal. The average value of the reciprocity index is 0.551 (s.d. 0.157), revealing sufficient coherence in the set of responses given.<sup>6</sup>

We also computed a “popularity” index, as the ratio between the number of inbound links and that of outbound ones (not shown). High value identify “popular” actors in the sense that they are widely known in the area. Particularly notable cases are those of “Gilgamesh” and “Sin”, who are popular among colleagues from other ports too, a potentially strategic position provided they enjoyed sufficient trust from others, an aspect we explore next.

### 5.2. Do they trust each other?

One of the key questions we posed is on the degree of trust the interviewed have on others. Values were expressed on a five level Likert scale as: “low”, “medium-low”, “medium”, “medium-high” and “high”. To determine whether or not there is coherence in the declared relations of trust, we classified as “coherent” only the pairs for which the expressed level of trust was similar (that is, differing at most by one unit on the 5 level scale). Coherence is quite high: 54 of the 75 pairs of actors who have reciprocally declared a relation of trust are coherent. In the graphs (b) and (c) of Fig.1, “positive trust” is represented by blue lines, indicating a link where medium-high or high level of trust has been reported by both actors, “neutral” trust links (a level of three on the Likert scale by both actors) are depicted by green lines and “negative trust” (levels of declared trust “low” or “medium-low”) are depicted by red lines. The comparative analysis of the networks clearly reveals that positive trust dominates.

### 5.3. Is there a relevant information flow?

A legitimate conclusion for the combined analysis of the acquaintance and trust networks might seem that fishermen in the FLAG area form a dense social network of actors among which there is sufficient trust. The result of the analysis of the network formed with links based on the reported exchange of information, both technical (not presented) and managerial (graph (d) in Fig. 1), revealing a very sparse presence of information exchange, thus came somehow with a surprise. Various hypotheses could explain this apparently inconsistent result. Is knowledge about technical and managerial issues, so commonly spread in the community that there is no longer reason for exchanges? Or, on the opposite side of the spectrum of possibilities, fishermen in the area are not even aware of the possibility and potential usefulness of exchanging information related to their technical activities?

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<sup>6</sup> Actors have been identified in the interview initially by the name of the boat. As a few names (such as “San Rocco” and “Maria”) are very common in the area, it is possible that there has been some confusion in identifying the right person, and this may explain a few of the low values of the index.

## 6. Concluding remarks

The analysis of the networks of acquaintance, trust and information exchanges in the area of the FLAG has revealed interesting, though somehow conflicting results. Fishermen know each other, as it may be expected in such a relatively small community. They also “trust” each other, or at least so declare, which means that there should be potential for strong professional links. When explicitly asked, however, they do not report to engage in active exchange information to any relevant extent. While the reasons for such a state of affairs need to be explored further, the fact remains that it certainly limits the possibility that information on important aspects of the foundation of local development policies, such as the presence of funding opportunities and of support programs, may circulate effectively.

In the personal interviews that have accompanied the fieldwork, fishermen reported that information on such opportunities have typically reached the area quite late, if at all. Fisherfolk feel they have not been deemed the main actors in the definition of local development plans and programs, which should instead be explicitly customised to their needs. There is certainly a problem, perhaps exacerbated by delays in the implementation phase of the FLAG. Yet, it is not clear how much current institutional settings are to blame for not permitting an adequate information flow, and how much instead the problem rests with the individual actors who, despite reporting the fact that they trust each other personally, may reveal a fundamental lack of trust in the institutions, as revealed by their limited participation to initiatives organized by the FLAG, which would be the main occasions for the exchange of professional information.

Innovations are needed to build on what appear to be a relatively strong foundation in terms of social ties, to tackle the most urgent needs and to find answer to questions on the future of the fishery in the area, including what will happen to the traditional swordfish hunting, a social and cultural inheritance that should not get lost.

## Acknowledgements

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