Intra- and inter-destination cooperation networks

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Abstract

Although cooperation in tourist destinations is often discussed in the literature, it is still valuable to search for new ways of assessing such cooperation. This concerns especially intra- and inter-destination collaboration. The aim of the paper is to discuss how cooperation within and among five tourist destinations forming one region can be assessed using the structural properties of the network. A region called the 'Beskid Five', located in Poland, was used as an example. It consists of five municipalities whose mayors signed an agreement on joint promotion. Its aim was to stimulate inter-municipal cooperation among tourism stakeholders from three different sectors (public, private and non-profit). Network analysis was used to assess cooperation among 225 key actors forming the 'Beskid Five' network, representing all three sectors. This means of assessment provided a view of cooperation from a new perspective, and can be applied in other tourist regions for development planning purposes.

Keywords: cooperation assessment; network analysis; tourism destination; intra-/inter-destination cooperation.

Introduction

Inter-organizational cooperation is a subject of interest for researchers in various fields of science. Such cooperation, understood as "a process that incorporates diverse entities working or acting together for common or mutual benefit" (Yang, 2018, p. 396), is also a subject of special importance for researchers of tourist destinations. This is because such cooperation very often takes place in this type of destination. The necessity for cooperation among different entities in tourist destinations results in them being perceived as networks composed of interrelated actors. This justifies analysing tourism cooperation from the point of view of the relationships among different actors using network analysis (NA). Although in recent years interest in this topic has grown (e.g., Raisi, Baggio, Barratt-Pugh, Willson, 2020; Ruggieri, Iannolino & Baggio, 2022), there are some areas referring to cooperation in tourist destinations which are still insufficiently analysed (also with the use of NA).

Firstly, as Mwesiumo and Halpern's (2019) review of inter-organizational relationships (IOR) papers shows, while issues related to relationship maintenance have received the most prominence in IOR-tourism literature, relationship structures are still under-researched. Network analysis (NA) is one of the possible approaches for analysing the structure of cooperation in tourist destinations. As Salancik (1995, p. 346) claims, the "network structure reflects much about the functioning of organizations and, possibly, their coordination failures or achievements".

Secondly, another gap highlighted in the literature is the limited amount of research on the measurement of inter-organizational cooperation in tourist destinations (Wilke, Costa, Freire, & Ferreira, 2019), excluding such measures as the number of formally established contracts (Cao, Vonderembse, Zhang, & Ragu-Nathan, 2010), or the percentage growth of partnerships (Combs & Ketchen, 1999). As emphasized by Wilke et al. (2019), simple measures such as these, while they allow cooperation to be assessed, omit many variables such as the level of communication, commitment, trust and information exchange, which are important aspects in cooperation. These can be reflected in the network structure of a given destination.

Thirdly, the literature emphasizes the need to study cooperation not only within a tourist destination, but also between destinations. Such research – especially that concerning concurrent investigation of intra- and inter-destination cooperation – is still conducted relatively infrequently. At the same time, as stressed by Fyall, Garrod & Wang, 2012 (p. 11), "collaboration within the destination is a necessary, but not sufficient condition for the achievement of their objectives; collaboration with other destinations is also required". It is claimed (e.g., Wang, Hutchinson, Okumus & Naipaul, 2013) that too much competition between destinations weakens the effectiveness and efficiency of tourism development of the whole area. NA can be very useful for simultaneously examining inter- and intra-destination relationships

Fourthly, although NA, thanks to its properties (e.g., specific parameters), allows cooperation to be evaluated in a way that is impossible with other methods, it does not answer all the questions, for example, why does the network look the way it does? At the same time, in the literature, when NA is used to analyze cooperation, it most often stops at using network theory. There is a gap in showing how other theories/concepts about cooperation complement the conclusions from NA in order to interpret the research results more thoroughly and comprehensively. It is consistent with claims that no single theoretical perspective is able to explain the complex nature of cooperation processes in tourist destinations (Wang and Xiang, 2007; Partelow & Nelson, 2020).

Finally, using NA to assess intra- and inter-destination cooperation can be very useful from a practical point of view. For example, it can indicate what stimulates or hinders cooperation within and between destinations the most, and allows for the formulation of practical recommendations for tourism area planning and development.

The paper fills indicated gaps and its aim is to discuss how intra- and inter-destination cooperation in a tourist region can be assessed using structural network properties. For this purpose, the cooperation in the 'Beskid Five' region located in southern Poland is used. 'Beskid Five' is considered a model example of inter-municipal cooperation in Poland. Meanwhile, while local government authorities perceived this cooperation as exemplary, private and non-profit sector entities did not necessarily perceive it the same way. This lack of consistency in the assessment of cooperation in this form inspired the authors to propose a more objective way of assessing cooperation using NA parameters, allowing to assess cooperation not so much from the perspective of a single actor, but from the perspective of the network as a whole. We present how to use a set of various NA parameters

to assess inter- and intra-destination cooperation among 225 key actors (representing three different sectors – public, private and non-profit) in the 'Beskid Five' region. Our research shows that the applied method of evaluating cooperation in a tourism region can be used on its own or as an additional method for evaluating such cooperation, as it provides a different, new perspective on the issue.

1. Theoretical background
2.1. Cooperation in tourist destinations and its assessment

Tourist destination constitutes the main place of tourist consumption, and thus also cooperation among entities enabling this consumption, i.e., creating tourist supply (Buhalis, 2000). These entities may represent one sector, but most often – due to the complex nature of the tourist destination product – they represent several sectors, public (e.g. local government), private (e.g. accommodation, transport, gastronomy) and non-profit (associations working for the development of tourism). Each of the entities in these sectors provides tourists staying in a tourist destination with various goods and services, which are complementary to one another. At the same time, due to the mobility of tourists and stiff competition between tourist regions, inter-organizational cooperation is not only cross-sectoral within one destination, but also inter-destination (Fyall et al., 2012). Thus, thanks to such cooperation, it is not only individual entities (Wilke et al., 2019) that can be competitive, but also an entire region consisting of several destinations (Czernek, 2013; Fyall at al., 2012). This paper will analyse this type of intra- and inter-destination cooperation among entities from different sectors.

In tourist destinations, the goals, scope and forms of cooperation may be different. For example, the goal may be the expansion and enrichment of the offer for tourists, cost reduction, or increasing the scale of marketing activities, especially when a partnership organization promotes the entire tourist destination or region (Albrecht, 2013; Naipaul, Wang and Okumus, 2009). Such cooperation may therefore be bilateral or multilateral, more or less formalized and of varying duration (Czernek, 2013).

Researchers have shown interest in various ways of assessing inter-organizational cooperation in tourism. A typical approach is analysing its outcomes (Mwesiumo & Halpern, 2019). This relates to such aspects as firm performance (Wilke et al., 2019), marketing outcomes (Wang & Xiang, 2007; Weidenfeld, 2013), sustainable tourism (Albrecht, 2013), or the economic success of the region (March & Wilkinson, 2009). It must be stressed, however, that any assessment of cooperation should be made not only from the perspective of the final effects (assumed goals), i.e., in the last phase of cooperation, but also in the course of its duration (Czernek-Marszałek, 2019; Wood & Gray, 1991) – which is where research on cooperation maintenance, activities and structure is important (Mwesiumo & Halpern, 2019).

In terms of cooperation maintenance, prior research was conducted on the factors determining cooperation (its course), e.g., the significance of conflict (Buhalis, 2000), the identification of key success factors (e.g., Björk & Virtanen, 2005), and the main problems that appear in cooperation, e.g., unfamiliarity among partners, lack of trust, power and communication differences, unhealthy competition, lack of leadership (e.g., Czernek, 2013; Saito & Ruhanen, 2017). This, however, only makes it possible to evaluate cooperation from the point of view of the particular aspects important for cooperation maintenance and is not always useful from the point of view of assessing cooperation at the destination level.

With regard to cooperation activities, the subject of prior research has been, for example, the process or degree of partners' involvement (e.g., Farsani, Coelho, & Costa, 2014), together with its impact on cooperation (Mwesiumo & Halpern, 2019).

In terms of cooperation structure, previous research has investigated the structural factors of cooperation, including the structural properties of networks, for example in tourist destinations (Saito & Ruhanen, 2017; Raisi et al., 2020; Yang, 2018; Naipaul et al., 2009; Partelow & Nelson, 2020). For instance, Gajdošík (2015) measured the cooperative behaviour of destination stakeholders in two destinations in Slovakia and Switzerland. This research showed how NA can be used to compare destinations and to better understand the problems of cooperative destination management. Another paper by Partelow & Nelson (2020) showed how social networks among different entities on the island of Gili Trawangan in Indonesia have facilitated the evolution of self-organized institutions for governance. Raisi et al. (2020) show how to use NA to research the inter-organizational transfer of knowledge in a tourist destination. The authors use NA parameters to assess the level of connectivity, centralization and reciprocity of the Western Australian network. Czernek-Marszałek (2019), using parameters such as the centrality of actors in the network, identified the entities most and least involved in cooperation in the studied destination, and analysed the importance of their roles for cooperation in the destination.

However, the studies mentioned above concerned mainly intra-, not inter-destination cooperation. Nor did they investigate intra- and inter-destination cooperation at the same time. Moreover, they did not always directly assess cooperation, and the focus was not necessarily on showing how the structural characteristics of the destination network can be used for this purpose.

Various theories have been used to interpret the results of tourism cooperation assessment. However, individual theories or concepts often provide only limited insights into the context of intra- and inter-destination cooperation (Wong, Mistilis, & Dwyer, 2010) due to it being a very complex topic. This is because each theory puts emphasis on different specific aspects and uses different perspectives. In addition, some theories used to analyse inter-organizational cooperation are not useful for analysing cooperation within or between destinations (Fyall et al., 2012). Therefore, it is recommended (e.g., by Beritelli, 2011; Fyall et al., 2012; Partelow & Nelson, 2020; Wang & Xiang, 2007) that different theoretical approaches are combined. This makes it possible to show a more complete, multi-faceted picture of cooperation and to make a more accurate assessment. Such an approach , where social capital theory (e.g., Cui & Yi, 2020; Rodriguez-Giron & Vanneste, 2019), transaction cost theory (Williamson, 1985) and social embeddedness theory (Czernek-Marszałek, 2020a, b; Granovetter, 2005) are used to interpret the results obtained through NA is presented in this paper.

2.2. Network analysis and its usefulness in research on cooperation in tourism

Network theory is useful for examining the complexity of relationships between different actors interacting in a social space. These actors can be individuals, groups or organizations. Such interrelationships are noticeable in particular in tourist destinations. By analysing such relationships, the network approach "is able to provide valuable insights into the flows of information and exchange of resources between such entities" (Fyall et al., 2012, p. 14). Interdependencies occurring in the network enforce collective action, i.e., cooperation among entities operating in tourist destinations (Morrison, Lynch, & Johns, 2004). Cooperation in the form of alliances, agreements and other governance structures helps to compensate for the fragmented nature of a tourism destination

(Baggio, Scott, & Cooper, 2013). Therefore, network theory is applied in tourism research with increasing frequency (e.g., Baggio 2020b; Partelow & Nelson, 2020; Raisi, Baggio, Barratt-Pugh, & Willson, 2018), especially at the destination level.

Networks are understood differently in the literature (Scott et al., 2007). In general, networks are said to be a group of actors linked by different types of relationships. In this understanding of networks, according to Newman (2003, p. 167), a network is "a set of items, which we will call vertices or sometimes nodes, with connections between them, called edges". One of the tools used in network research is,
previously mentioned, network analysis.

NA is a technique which allows for the mapping and analysing of relationships among "people, teams, departments, and even entire organizations" (Yang, 2018, p. 403). Contrary to traditional statistical methods, NA focuses on the interdependency of nodes by treating individual nodes as embedded in a greater structure, thus not acting in isolation but taking decisions and actions that affect other entities in a given structure, and influenced by such entities. Moreover, reports analysed using the network approach can be investigated in a quantitative manner, which enables the measurement of the phenomena under analysis. As Gajdošík (2015, p. 42) claims, referring to the usefulness of network analysis for the phenomenon of cooperation, "the opportunity to explore the cooperative relationships between the stakeholders in quantitative terms allows researchers to look at the cooperation in the destinations in terms of structure, strength and intensity and compare these destinations with each other". Firstly, this enables the analysis and assessment of cooperation in a more objective manner. Secondly, by examining the structure of the network, it enables us to look at cooperation as a whole. This is possible thanks to the representation of a network as a mathematical abstraction: a graph. Thirdly, NA enables comparisons to be made, for example between the studied networks (e.g., destinations or partnership organizations). Fourthly, it allows analysis to be conducted not only statically, but also in dynamic terms, while fifthly, using NA enables network relationships to be simulated, and thus forecast (e.g., to analyse the course and potential diffusion of innovations or knowledge desirable in tourism cooperation).

3. Materials and methods
3.1. Research case study

For the purposes of the research, a tourist region was chosen consisting of five tourist destinations – municipalities located in the south of Poland – Szczyrk, Ustroń, Brenna, Wisła and Istebna (Figure 1).

The region was chosen as it met the following purposeful sampling requirements (Miles & Huberman, 1994): 1) the sample is related to the research problem; 2) the phenomenon under study may occur in the studied sample; and 3) sampling is practically feasible (for example due to the researcher's knowledge about the research context).

Figure 1: The 'Beskid Five' region in Poland
Map of the 'Beskid Five' region in southern Poland with the five municipalities marked that make up the 'Beskid Five' organization.

Regarding the first and second criteria, in 2004 the five municipalities created an association called 'The Beskid Five'. Its aim was joint promotion of the area as one tourist destination. Moreover, each of the five municipalities is an attractive and popular tourist area in itself, and thus can be treated as an individual tourist destination. Both summer and winter tourism are well-developed in these municipalities, while the offer of each can be complemented by the others. Szczyrk and Wisła focus mainly on active tourism (skiing), Ustroń is a spa area, Brenna is a place strongly focused on family tourism – weekend and agritourism – while Istebna bases its offer on local culture and folklore. Regardless of the cooperation among the municipalities under the auspices of the 'Beskid Five', various types of cooperation were also noticeable in each of the five municipalities. Thus, the choice of area ensured that the phenomenon researched would occur, i.e., cooperation within and across tourist destinations (the second sampling selection criterion). Moreover, the time that has passed since the creation of the 'Beskid Five' organization in 2004, and the opportunity for implementing the goals underlying its establishment, justified the choice of the area as the subject of the analysis.

Regarding the third criterion, one of the authors knew the research context relatively well (due to several years of field research conducted in the area), and this also influenced the decision to choose the 'Beskid Five' for the empirical research.

3.1.1. Cooperation in the area of the 'Beskid Five'

The 'Beskid Five' was established on the initiative of the mayors of the municipalities, who noticed that despite the competition existing between the municipalities, there were areas in which they could cooperate, and that the joint marketing of the entire region as a single tourist destination could potentially be beneficial for each municipality. The mayors believed that the 'Beskid Five' was working very effectively and that thanks to this, it would be possible to stimulate inter-organizational cooperation in the region (especially among private and non-profit organizations in the five different municipalities). Apart from promoting the region, this was one of the goals of establishing the 'Beskid Five' (Knop, Krannich & Olko, 2008). At the same time, many representatives, especially from the

private sector and non-profit organizations, had a completely different perception regarding the effectiveness of the 'Beskid Five' activity. They realized that its existence did not translate into real cooperation among entities involved in the development of tourism in the whole region. Such a lack of consistency between the statements of local authorities and private and also non-profit sector representatives was the inspiration for formulating the aim of this paper, i.e., to assess the 'Beskid Five' cooperation with the use of NA as a more objective perspective.

To achieve this aim, selected network analysis parameters were used. These were applied in order to determine whether the 'Beskid Five' cooperation, perceived by the mayors as very successful, does indeed integrate different entities operating in this area. Without the active cooperation of entities from other sectors – the private and non-profit sectors – and from all five municipalities, the development of tourism in the region would not be effective.

3.2. Data collection and network analysis

The phenomenon under analysis was cooperation for the development of tourism in the 'Beskid Five' area. The cooperation was defined and presented to the respondents, together with its main possible forms identified on the basis of the literature – as the forms most often found in tourist destinations (Fyall at al., 2012; Czernek, 2013; Żemła, 2014) i.e.: 1) informing about complementary attractions and recommending them to tourists, 2) taking guests to other attractions or jointly organizing attractions for them, 3) recommending other facilities when one's own is overbooked, 4) price reductions – e.g. joint tickets, ski pass., 5) joint promotion – e.g. catalogues, brochures. 6) exchange of experiences, 7) joint products (investments), 8) membership in joint organizations e.g. Destination Management Organizations (DMO) and 9) other forms. The process of respondent selection consisted of a few stages and is synthetically presented in Diagram 1.

As a target group of respondents, we aimed to select the key stakeholders from each of the five municipalities (Christopoulos & Aubke, 2014) i.e., entities that played the most important role in the municipality and in the region's tourism development. The key stakeholders were identified based on interviews with local officials and employees in each of the five tourist information centres. These people were interviewed because of their extensive knowledge about all the entities whose offer is the most popular among tourists, and whose activity regarding tourism development is the most visible in the area. Firstly, they were asked to confirm whether the actors initially selected by the researcher (based on secondary sources, i.e., the promotional materials of each municipality – website, catalogues) can be perceived as key tourism stakeholders in the municipality and the region. Secondly, they were asked to indicate other possible individuals that could be included in the final respondents sample (the snowball technique) (Christopoulos & Aubke, 2014). We assumed that potential final respondents would represent the three main sectors: public, private and non-profit. The public sector consisted of local authorities or officials responsible for tourism development in each municipality. The private sector was represented by the largest tourism firms providing accommodation, gastronomy, tourist attractions, transport and other services, and travel agencies.
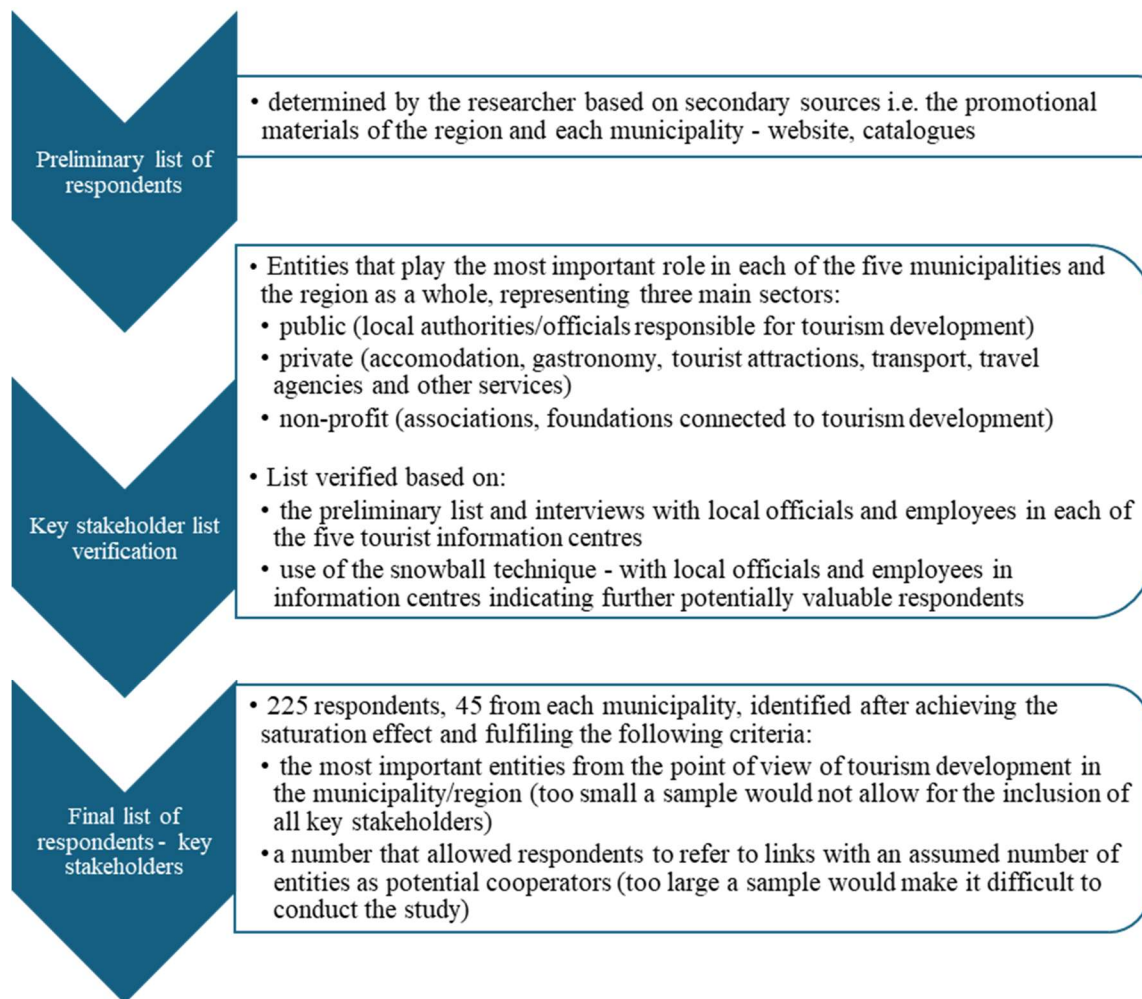
Preliminary list of respondents
- determined by the researcher based on secondary sources i.e. the promotional materials of the region and each municipality - website, catalogues

Key stakeholder list verification
- Entities that play the most important role in each of the five municipalities and the region as a whole, representing three main sectors:
  - public (local authorities/officials responsible for tourism development)
  - private (accomodation, gastronomy, tourist attractions, transport, travel agencies and other services)
  - non-profit (associations, foundations connected to tourism development)
- List verified based on:
  - the preliminary list and interviews with local officials and employees in each of the five tourist information centres
  - use of the snowball technique - with local officials and employees in information centres indicating further potentially valuable respondents

Final list of respondents - key stakeholders
- 225 respondents, 45 from each municipality, identified after achieving the saturation effect and fulfiling the following criteria:
  - the most important entities from the point of view of tourism development in the municipality/region (too small a sample would not allow for the inclusion of all key stakeholders)
  - a number that allowed respondents to refer to links with an assumed number of entities as potential cooperators (too large a sample would make it difficult to conduct the study)

Diagram 1: Respondent selection process for research in the 'Beskid Five"
A diagram using downward arrows (on the left) showing three consecutive groups of steps taken as part of the respondent selection process for research in the 'Beskid Five'. On the right side there is a description of the actions taken in each of the three groups of steps.

The non-profit sector representatives were from associations and foundations connected to tourism development. In total, 225 entities were selected for the research – 45 key stakeholders from each municipality and from each of the three sectors (see Table 1). This number is the result of two main factors. Firstly, based on secondary sources and interviews with local authorities and officials, we tried to ensure that the group included all the most important entities from the point of view of tourism development in the municipality and the region. Thus, we collected respondents until the saturation effect was achieved (i.e. the names of key actors identified by our different sources of information began to be repeated). Secondly, it was important to ensure that the respondents would be able to refer in the study to links with an assumed number of entities as potential co-operators. It was found that if this number was too large, it would be difficult to conduct the study. Taking into account these premises, it turned out that for each of the five destinations covered by the study, a minimum of 45 entities were needed. When this level was reached in each destination, we abandoned further recruitment for the study.

As a result, surveys were conducted with 225 entities with the use of a survey questionnaire.

Table 1: Entities (nodes in the network) according to type of activity

Feature	Szczyrk	Wisła	Ustroń	Brenna	Istebna	Total
Location						
No. of interviewees	45	45	45	45	45	**225**
Type of activity						
Associations	1	2	1	2	2	**8**
Tourist attractions	4	15	12	11	9	**51**
Accommodation	22	14	18	17	20	**91**
Local authorities	1	1	1	1	1	**5**
Gastronomy	7	6	5	5	4	**27**
Services	10	7	6	7	8	**38**
Travel agencies	0	0	2	2	1	**5**
Size (no. of employees)						
Micro (less than 10)	28	24	23	31	39	**145**
Small (10-49)	17	19	19	13	6	**74**
Medium (50-249)	0	2	3	1	0	**6**
Large (more than 250)	0	0	0	0	0	**0**

Each respondent was asked with whom from among those included on the final survey list he or she had cooperated in the last three years. This cooperation was defined and presented to the research participants, together with its nine possible forms. All meetings with respondents were conducted face-to-face, not online. The researcher was thus able to clarify any issues that were not clear to the participants. This decision was also taken because the list of potential co-operators was long, consisting of 224 entities from the participant's municipality and the four other neighbouring municipalities. If a particular type of cooperation was declared between any two entities, the link between them received the rating 1, and if not, 0. To calculate the set of NA parameters presented below (Table 2), the answers regarding the nine possible types of cooperation were aggregated.

On the basis of the question with whom each participant had cooperated in the last three years, we created a 225*225 binary matrix reflecting 1852 individual business cooperation relationships, which formed the network to be analysed. Among the many possible network measures, we used fragmentation index, degree distribution, clustering coefficient, diameter, average network path length, reciprocity, and modularity (we refer the reader to the literature for a detailed definition and justification for using these particular measures: see e.g., da Fontoura Costa, Rodrigues, Travieso, & Villas Boas, 2007).

The results of the network analysis are presented in section 4. Their detailed interpretation and discussion are presented in section 5.

4. Empirical results

The network presented in Figure 2 is a visualization of the geographical subdivision of the 225 key actors in the 'Beskid Five' region. Actors from different municipalities are identified in the figure with different colours.

The main characteristics of the network are listed in Table 2.

Table 2: Main network parameters

Metric	Value	Description
Node count	225	number of nodes
Link count	1852	number of links
Density	0.073	ratio between the actual number of links and the maximum possible number
Giant cc nodes fraction	0.991	fraction of nodes in the largest connected component
Fragmentation index	0.018	proportion of pairs of nodes that cannot reach each other
Reciprocity	0.378	fraction of vertices in the directed network that are mutually linked
Diameter	5	distance between the two most distant nodes
Average path length	2.541	average distance between any two nodes
Average clustering coefficient	0.524	degree to which nodes in a graph tend to cluster together, local density
Global efficiency	0.434	global efficiency of the network in transferring information
Average local efficiency	0.723	average nodal efficiency
Modularity (main cc)	0.578	strength of network division into modules (communities)
No. of communities	5	number of communities found
Gini index degrees	0.415	Gini index for the degrees (measure of inequality of the degrees)
Degree distribution	lognormal	shape of the degree distribution (parameters are: m=2.16, s=0.82)
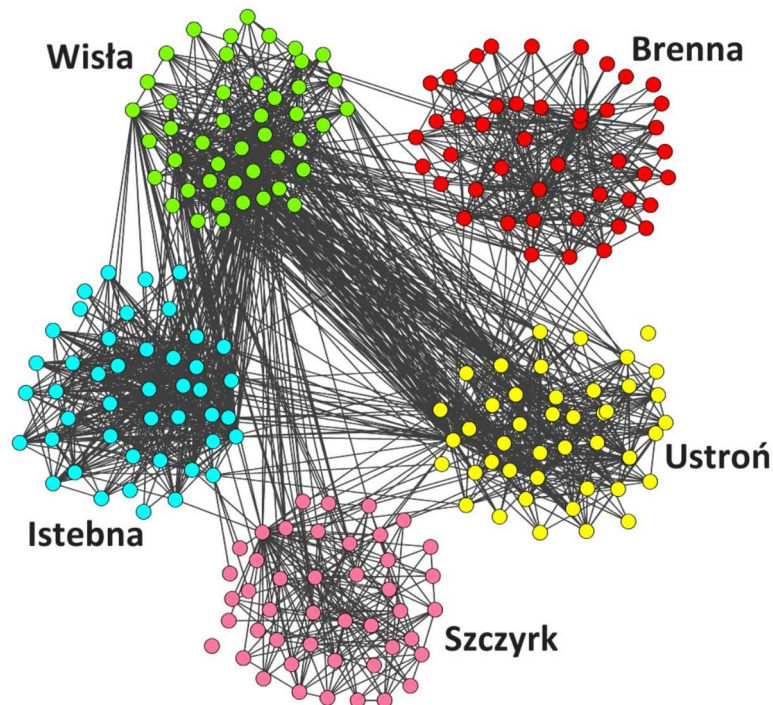
Figure 2: The 'Beskid Five' network of cooperating entities
A network consisting of entities representing five municipalities of the 'Beskid Five' connected by relations.
Five separate clusters are visible, each of which represents entities from individual five municipalities.

The network is directed and the size of the network is 225 nodes and 1852 ties. The fragmentation of the network is low (fragmentation index = 0.018) – the ties practically create a single connected component (cc nodes fraction = 0.991). The network density is low, at 0.073. Based on this result, it can also be concluded that only about 7.3% of the entire network is covered by any cooperative connection.

The density for individual types of cooperation was also calculated (see Table 3), and these are visualized in the 9 corresponding graphs in Table 4. The density of each of the networks is generally low, with the highest density at nearly 4%. The densest cooperation networks are for informing about complementary attractions and recommending them to tourists, as well as exchanging experiences. Meanwhile, with the exception of "other forms of cooperation", the least dense cooperation networks are membership in joint organizations, joint products (investments) and price reductions.

Table 3: Density calculations for the nine types of cooperation

No.	Type of cooperation	Density
1.	Taking guests to other attractions or jointly organizing attractions for them	0,0051
2.	Recommending other facilities when one's own is overbooked	0,0092
3.	Price reductions – joint tickets, ski pass, etc	0,0038
4.	Joint promotion – catalogues, brochures	0,0112
5.	Joint products (investments)	0,0039
6.	Informing about complementary attractions and recommending them to tourists	0,0396
7.	Membership in joint organizations e.g. Destination Management Organizations	0,0010
8.	Exchange of experiences	0,0271
9.	Other forms	0,0019

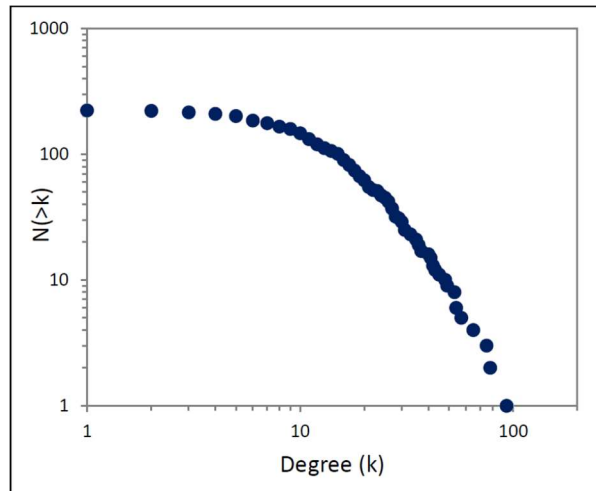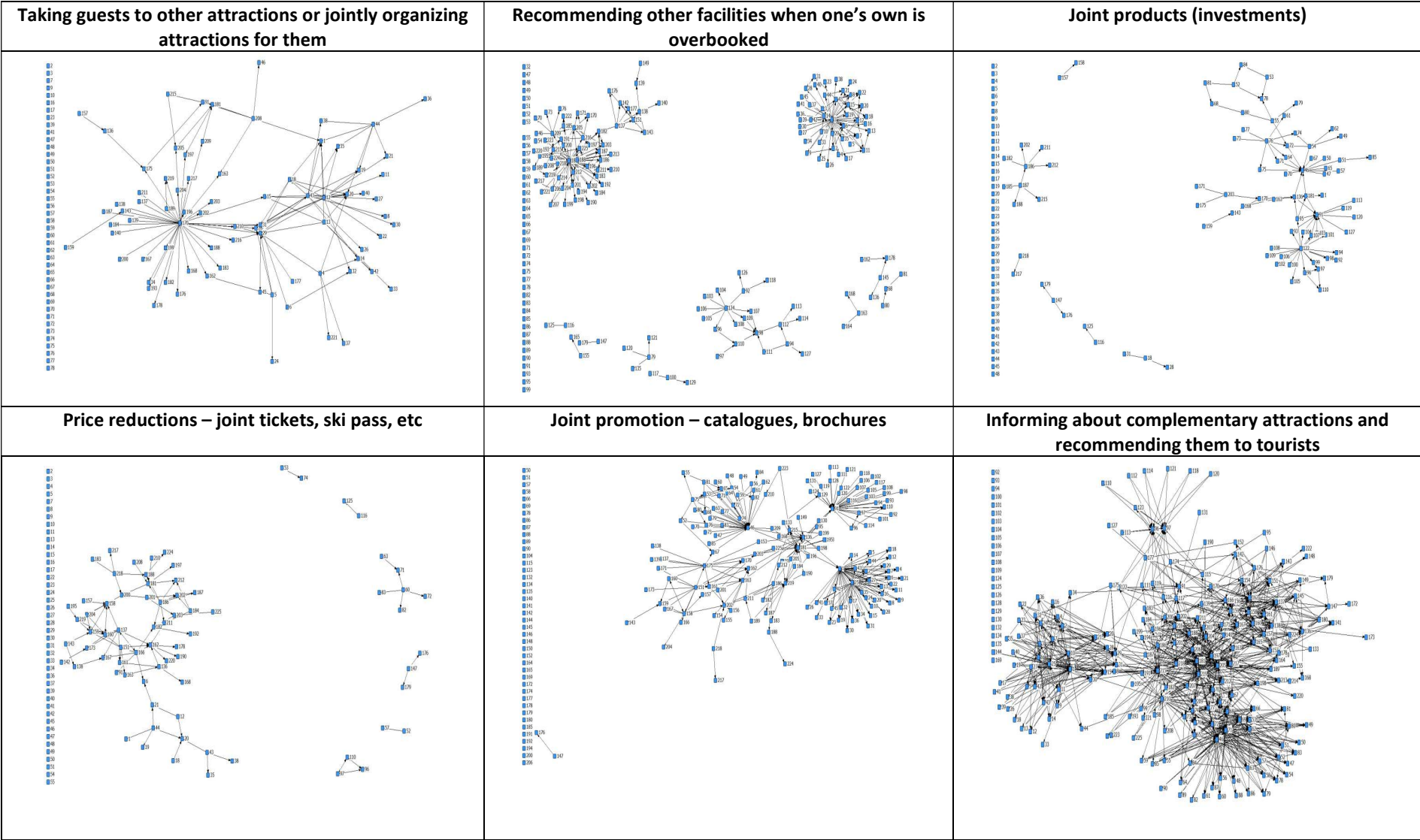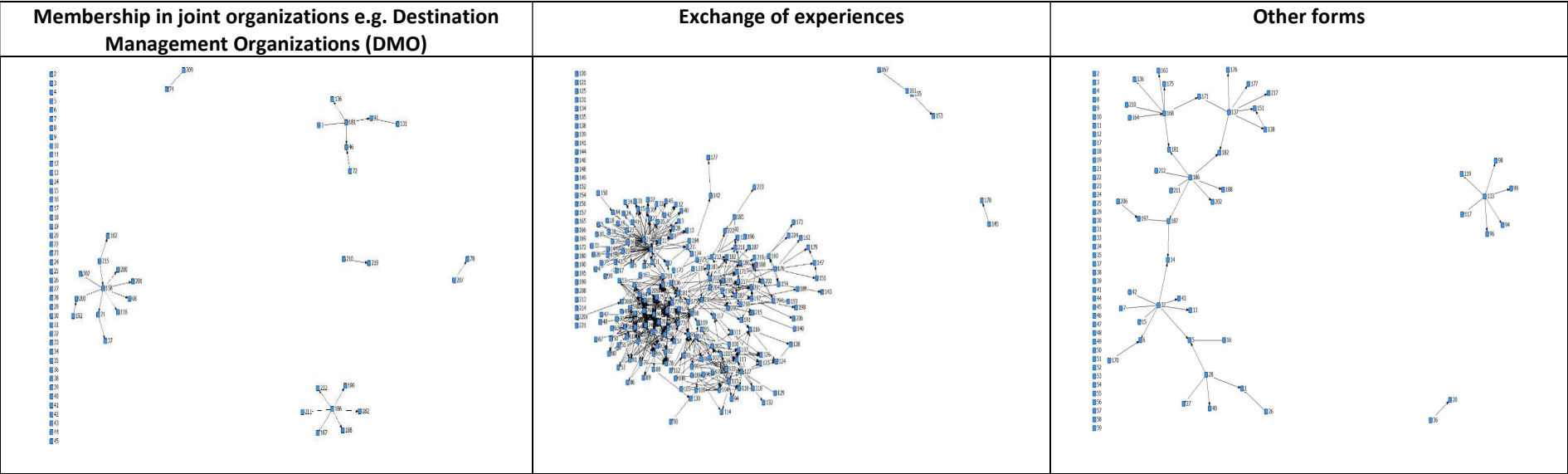We also analysed the cumulative degree distribution, as shown in Figure 3.

Figure 3: Cumulative degree distribution
A graph showing cumulative degree distribution being of lognormal shape: N(>k) the number of nodes with degree greater than or equal to k.

Table 4: Graphs for the nine types of cooperation in the 'Beskid Five' region

Taking guests to other attractions or jointly organizing attractions for them	Recommending other facilities when one's own is overbooked	Joint products (investments)

Price reductions – joint tickets, ski pass, etc	Joint promotion – catalogues, brochures	Informing about complementary attractions and recommending them to tourists

Membership in joint organizations e.g. Destination Management Organizations (DMO)	Exchange of experiences	Other forms

The shape is that of a lognormal distribution, which can be interpreted as arising from a formation mechanism, a variation of the well-known preferential attachment mechanism (nodes link with higher probability to other high degree nodes) constrained by physical characteristics (the geography of the locations or the capability of an actor to connect to others), and the distance-dependent cost of forming long-range connections. Based on this, it can be concluded that the probability of finding a connection between two destinations decreases exponentially as the spatial distance increases.

Another important characteristic that may be useful in assessing cooperation among entities in the 'Beskid Five' area is the clustering coefficient. In this network, the value is 0.524. This means that on average, 52% of all possible links within the neighbourhood of an organization in the network are actually present, thus the average probability that an actor could be involved in any collaborative group is about 52%.

Moreover, we checked whether the network meets the condition known as *small world*. This occurs when average path length of the network is relatively small, while at the same time the clustering coefficient is relatively high. The average path length is 2.541 and, as mentioned above, the clustering coefficient is relatively high, i.e., 0.524. When the clustering coefficient/average path length ratio is compared to the same in a completely random network, it provides an indicator for the small-worldness of a network. In our case, this ratio is 4.8, which indicates the presence of *such small world* structure for the network (see e.g. Da Fontoura Costa et al., 2007).

In a directed network, reciprocity is especially interesting since it shows the extent to which the actors perceive each other as partners in cooperation. Our value is 0.378, that is to say that only about 38% of the ties in the network are reported as mutual, which indicates a limited but still noticeable tendency.

Since five municipalities were researched, we assumed that the network could consist of smaller groups such as communities or clusters. The modularity for this network is 0.578, which is relatively high, and 5 communities were identified. We used an adjusted Rand index, and adjusted mutual information to assess the possible similarity between the partitions identified and those according to geography, age or business type. Neither measure provided evidence that network communities are created based on business type, size or age (see Table 5).

Table 5: Basis for community building

Partition 1	Partition 2	AdjRandIdx	AdjMutInfo
community	municipality	0.966	0.947
community	business type	0.002	-0.007
community	Size	0.015	0.017
community	Age	0.005	0.006
municipality	business type	0.004	-0.004
municipality	Size	0.016	0.018
municipality	Age	0.003	0.004
business type	Size	0.045	0.061
business type	Age	-0.018	0.023
Size	Age	-0.013	-0.004

On the other hand, both measures showed a high similarity between the revealed communities and the municipalities (adjusted Rand index = 0.966 and adjusted mutual information = 0.947). This means that intra-municipal (intra-destination) cooperation prevails rather than inter-municipal (among all 'Beskid Five' destinations). This is clearly shown in Figure 2, as well as in Table 6, which provides the densities of the five municipal clusters, all somewhat higher than the overall density of the network.

Table 6: Density of municipality subnetworks

Municipality	Density
Whole network	0.073
Brenna	0.241
Istebna	0.438
Szczyrk	0.175
Ustroń	0.299
Wisła	0.303

5. Discussion

In this section, we discuss the results of the cooperation assessment carried out on the example of the 'Beskid Five' region and show how the proposed set of NA metrics can be interpreted. In a synthetic way these parameters, together with their interpretation, are presented in Table 7, which creates a framework for the cooperation assessment method.

We discuss our findings with the existing knowledge in the literature regarding NA used to analyse cooperation in other tourist destinations and refer to the theories and concepts that are useful in better explaining the NA results.

Regarding the 'Beskid Five' region, the calculated parameters reveal a relatively low level of cooperation in the region. While the local authorities of the five municipalities do cooperate with each other (and assess this cooperation very positively), the level of cooperation among other key stakeholders representing various sectors and different municipalities turned out to be relatively low. Thus, the goal of the 'Beskid Five', among others to integrate and stimulate tourism cooperation among entities representing three different sectors from the area of the five municipalities, seems not to have been achieved. Therefore, the enthusiasm of the local authorities regarding the assessment of the 'Beskid Five' cooperation cannot be shared. In the analysed case study, intra- rather than inter-destination cooperation dominates. As Mwesiumo and Halpern (2019) stress, effective intra-destination cooperation can be a precondition to successful inter-destination cooperation. Thus, the research results have shown that there is potential in the case of the 'Beskid Five', however, this potential has not yet been exploited. This is evidenced by more objective data, i.e., the values of the calculated network parameters presented synthetically in Table 2.

Table 7: Set of network parameters used in inter- and intra-destination cooperation assessment

No.	Metric	Use in cooperation assessment
1.	Node count	The size of the cooperation network
2.	Link count	
3.	Density	What part of possible relationships in the network (0-100%) is cooperation? For sub-networks (9 types of cooperation): which form of cooperation is the most/least popular and why (e.g. because of location, type of cooperating entities)?
4.	Giant cc nodes fraction	To what extent the network of cooperating actors creates a connected component?
5.	Fragmentation index	
6.	Reciprocity	To what extent are relationships reciprocal – convergence/divergence in perceptions of cooperation?
7.	Diameter	The distance between actors in a network. Probability that an organization can be involved in any collaborative group. Properties of the small world – assessment of the potential level of cooperation
8.	Average path length	
9.	Average clustering coefficient	
10.	Global efficiency	Efficiency in transferring information in a network of cooperating actors – for a network and an average actor in a network
11.	Average local efficiency	
12.	Modularity (main cc)	Whether, to what extent and based on what similarities (e.g., type of organization, location, etc.) entities are joining together in cooperative communities, and what is the number of communities in the network
13.	No. of communities	
14.	Gini index degrees	Analysing tendencies to cooperate – with similar or different actors.
15.	Degree distribution	Actors having a lot of cooperation relationships link rather actors having also a many cooperation links (this is constrained by physical characteristics, e.g. the geography of the locations – e.g. actors in two distanced municipalities)

Firstly, the overall density of the network is low (0.073). This means that, according to cohesion theory, the level of connectivity in the network is also low. Low network density limits the flow of resources in the network and raises transaction costs (Hwang & Stewart, 2017), thus hindering, for example, communication (Kim & Shim, 2018) and the flow of knowledge or information, limiting cooperation and development of the network as a whole. Although the level of the 'Beskid Five' network density is in line with other research showing that the density is usually low or very low (for instance at the level of 0.027 in Baggio's research (2020a, see Table 4; see also Del Chiappa & Baggio, 2015)), in this case, the aim of the 'Beskid Five' cooperation was to stimulate inter-organizational (and inter-sector) cooperation between entities from all five municipalities, so the result should have been higher.

This is also confirmed by the density of the networks calculated for each of the nine types of cooperation. The densest networks of cooperation were identified for: informing about complementary attractions and recommending them to tourists (0.0396), and exchanging experiences (0.0271). These are forms of cooperation that are usually informal and are likely to involve limited or even no cost. The least dense cooperation networks are: membership in joint organizations (0.0010), joint products (investments) (0.0039) and price reductions (0.0038). These, meanwhile, are very concrete forms of cooperation, often requiring the commitment of resources, and incurring real, tangible costs. This leads to the conclusion that cooperation in the 'Beskid Five' region is still underdeveloped and rather unformalized. At the same time, it is worth adding that the relatively high level of cooperation in terms of informing about complementary attractions, recommending them to

tourists and exchanging experiences, is fully justified by the complementarity of the offer provided by the five destinations (see section 3.1.) and may generate significant benefits for all parties to the cooperation (Czernek-Marszałek, 2020a; Naipaul et al., 2009; Yang, 2018). Moreover, these three forms of cooperation constitute a good starting point for deepening cooperation in other areas – e.g. joint investments/products related to skiing, which is well-developed in most of the five municipalities, or jointly organized events e.g. in the form of the Beskid Culture Week, a cyclical event on an international scale. The benefits of such cooperation are both individual – for entrepreneurs (Wilke, et al., 2019; Albrecht, 2013) representing: accommodation, travel agencies, tourist attractions, gastronomy or other services (for example, in the form of cost reduction or an increase in the number of customers), and collective – for all five municipalities and the entire region (Czernek. 2013; Naipaul et al., 2009), which, thanks to developed cooperation, become more competitive (Fyall at al., 2012) and can thus attract a larger number of tourists and/or ensure they stay in the region longer. Therefore, it is essential to take into account inter- and intra-destination cooperation in its different forms in the planning and development of the 'Beskid Five' region.

Secondly, regarding the other parameters of the network, there is also a relatively short average path length (2.541) and diameter (5). Small network distances between actors facilitate and accelerate the flow of resources in the network (Cowan, 2005), thus making cooperation easier. The clustering coefficient for this network was relatively high (52.4%), which together with the results for diameter and average path length, indicates that the network displays small-world properties. The clustering coefficient/average path length ratio (4.8) (see: Albert & Barabási, 2002) shows that the potential for cooperation development in the 'Beskid Five' is relatively high – everyone in the network can be reached via a short chain of relationships. However, the low level of density in the network shows that this potential has not been exploited.

This is also confirmed by a third issue, the low level of reciprocity in the network (37.8%), as a result of which most ties (62.2%) are not mutual (are not perceived the same way by both partners). This may mean that in many cases, even if there is cooperation between partners, it is not seen as essential to an organization's activities, or that the different stakeholders do not consider the possible connections in terms of information exchange as the basis for any cooperation.

Fourthly, the modularity index (0.578), together with the calculation of the adjusted Rand index and adjusted mutual information, points to the fact that the 'Beskid Five' region consists of five sub-networks, with municipal affiliation acting as a basis for community creation. By analysing the graph in Figure 2, and also the graphs for different types of cooperation, e.g. joint promotion or recommending other facilities (Table 4), it can also be concluded that the entities cooperate mainly within municipalities, and not across the entire 'Beskid Five' region (by analysing actors' numbers in the whole 'Beskid Five' network, it can be seen that different types of cooperation are reflected in the graphs of entities usually representing the same municipality). Also, the relatively high density of cooperation among entities within each of the five municipalities (significantly higher than the density of cooperation in the whole area – see Tables 2 and 6) confirms the domination of intra- rather than inter-destination (municipal) cooperation.

This may be due to various reasons, which can be explained with the use of a few complementary theories, i.e., social capital, including bonding and bridging capital theory (Kim & Shim, 2018; Hwang & Stewart, 2017), transaction cost theory (Williamson, 1985) or social embeddedness theory (Granovetter, 2005).

According to the concept of bonding and bridging capital (Burt, 2000; Rodriguez-Giron, & Vanneste, 2019), the maintaining of relationships between entities close to one another – from the same community or municipality (bonding capital) – promotes cooperation because there is trust and a quick flow of resources, which makes communication between partners easier (Burt, 2000; Hwang & Stewart, 2017). Moreover, bonding capital enhances the capacity to detect and punish defective behaviours (Hwang & Stewart, 2017). It is said that this positively influences the effectiveness of a network (Cui & Yi, 2020). Prior qualitative research conducted in the geographical area covered by this study shows that this could definitely be one of the reasons why intra- rather than inter-destination cooperation is more developed in the 'Beskid Five' (Czernek, 2013). Although dense networks favour cooperation, at the same time the literature emphasizes that too high a density also has a 'dark side'. Excessive network relation density is not conducive to innovation or creativity, and causes closure (lock-in) to other, unknown solutions or activities (Czernek-Marszałek, 2020b). Thus, relying only on bonding capital limits the influx of new ideas and network innovation. Building so-called bridging capital is also needed (Cui & Yi, 2020). Bridging capital, consisting of establishing relationships with entities from outside of one's own, well-known environment, is conducive to innovation (Rodriguez-Giron & Vanneste, 2019). Thus, it is claimed that for the proper development of a given area, it is necessary to build both bonding and bridging capital. A limitation to the development of the 'Beskid Five' area therefore seems to be underdeveloped bridging capital.

Transaction cost theory (Williamson, 1985) may also be useful in providing some explanations here. According to the theory, organizations more willingly cooperate with entities located close to them due to the fact that such cooperation is associated with lower costs (e.g., travelling to a partner, organizing meetings). This may be the reason why intra- rather than inter-destination cooperation prevails (Fyall et al., 2012). In the 'Beskid Five', inter-destination (inter-municipal) cooperation was to some extent noticeable, but it mainly concerned entities located in neighbouring municipalities, often on the outskirts of these areas. On this basis, we can claim that the criterion for community formation is not only administrative, but also (and perhaps even more so) geographical, which is connected to transaction costs. Also, the cumulative degree distribution seems to confirm our claims, since its lognormal shape means a rapid (exponential) decay in the probability of finding a connection between two destinations with increasing spatial separation (see e.g., Alizadeh, Cioffi-Revilla, & Crooks, 2017; Mitzenmacher, 2004).

This can also be seen by analysing the graphs for the nine different types of cooperation (Table 4). All the types of cooperation occur mainly inside municipalities, however, in some cases there is visible cooperation between entities from neighbouring municipalities, such as Wisła and Ustroń (taking guests to other attractions, jointly organising attractions for them) or Wisła and Istebna (informing about complementary attractions and recommending them to tourists). These types of cooperation do not involve any costs, and even if they do, these costs are relatively small due to the proximity of the location.

On the other hand, the theory of social embeddedness (Granovetter, 2005) states that entities cooperate mainly with partners they personally know and trust. Such ties are most often built with neighbours, or with entities with whom entrepreneurs have social relationships often formed in previous workplaces, schools or partnership organizations (Hwang & Stewart, 2017). Such relationships are most often built within municipalities or even individual districts. Moreover, it is claimed that one of the sources of social embeddedness favouring cooperation may be a sense of

community, which is strongest at the local level. Also, previous qualitative research findings, especially in Wisła (Czernek-Marszałek, 2020 a, b), seem to confirm this statement.

6. Conclusions

The aim of the paper was to discuss how intra- and inter-destination cooperation can be assessed using structural network properties. To achieve this aim we propose a set of NA parameters as a new way of cooperation assessment. Although these parameters are not new in themselves, their selection – so that they create a set of the most adequate and complementary measures for assessing intra- and inter-destination cooperation – determines the originality of the research approach used. Additionally, this approach is based on the new idea of assessing inter- and intra-destination cooperation, which determines also the method of collecting material so as to be able to analyze cooperation in its nine forms and in an aggregated way in a single municipality and the whole region as well. Although in this text we have not focused on analysing or detailed comparison of the nine types of intra- and inter-destination cooperation, it is worth noting that to date in the literature, network analysis has not been applied to several hundred entities from one region (including several municipalities and sectors) by type of cooperation. This we see as a value in itself and an element that could become the subject of deeper analysis in other works.

Moreover, a proposed way of assessment is a ready-to-use tool that can be successfully applied to assess intra- and inter-destination cooperation in other tourist regions. Such an assessment may, in turn, be useful for planning the development of tourism in a region with the participation of various interested parties.

By achieving the aim of the paper and proposing a new method for assessing inter- and intra-destination cooperation, we fill several literature gaps.

Firstly, we focus on network structure analysis, which to date has not been widely used in tourism cooperation evaluation (Mwesiumo & Halpern, 2019). We use variables that are of key importance when it comes to cooperation, i.e., relations between actors (Wilke, et al., 2019), the content of which are nine different kinds of cooperation. At the same time, we contribute to the limited research on the measurement of cooperation in tourist destinations, omitting the simple and popular measures usually used previously (Wilke et al., 2019; Cao et al, 2010). Moreover, the proposed method of evaluation is more objective as it allows for assessment of the entire structure of the network, and not only relates to the subjective feelings of the respondents regarding cooperation. Indeed, our analysis demonstrates that the subjective assessment of the 'Beskid Five' cooperation differs from our assessment based on NA. Therefore, our proposed method can be used not only on its own, but also as a complement for or comparison with an assessment made using another method, or conducted from a different perspective or using a different type of study, such as qualitative research.

Secondly, we analysed cooperation not only within one tourist destination, but also between destinations (municipalities), which is also rarely the subject of analysis although it is strongly recommended by some authors (Fyall et al., 2012; Mwesiumo & Halpern, 2019; Wang et al., 2013). The analysis in the paper made it possible not only to assess the level of cooperation in each municipality, but also to compare these levels.

Thirdly, what is also new is the combination of conclusions from NA with the achievements of other theories/concepts on cooperation. We show what exemplary theories/concepts and in what areas they can be useful to better understand intra- and inter-destination cooperation, when the starting point are the conclusions from NA.

Based on the research some practical recommendations can be formulated. In order to plan the development of a tourism region, effective cooperation is needed between different sector entities from the municipalities that make up the region. This condition was not met in the case of the 'Beskid Five' due to the emphasis only on formal signed cooperation between local authorities, excluding the private and non-profit sectors. Planning the development of tourism in a situation where entrepreneurs do not feel included in the proposals of local authorities means that they do not feel like co-authors of these proposals (Czernek, 2013). Thus, efforts should be made to encourage to cooperation and integrate entities from the whole area in order to stimulate tourism planning and development for the benefit of the entire region. In such a situation, one solution could be to create an organization (perhaps a DMO), which would associate representatives of the three sectors from all municipalities. Such solutions work well in planning the development of tourist regions (e.g. investments, marketing activities) because DMOs bring together entities from different sectors and therefore have at their disposal different, mutually complementary resources and competences (Soteriades, 2012; Czernek-Marszałek, 2019). They enable cooperation between entities who feel they are both equal partners and co-creators of the vision of the region's development, and at the same time co-responsible for its implementation (Melis, McCabe, Atzeni & Del Chiappa, 2023). Moreover, through the various stages of cooperation focused on planning the development of a tourist region, members of DMO get to know each other, better see the benefits of working together and complementing one another to achieve complex regional goals, which in turn encourages them to further cooperation. Finally, the presented assessment of cooperation can be used to identify the actions that need to be taken by a joint organization (e.g. a DMO), for example verifying the scale of cooperation in a region (i.e. what geographical area it covers or what types of entities are involved). It can also be applied as a means of controlling activities already implemented by the organization in the field of regional tourism planning and development.

This study has some limitations which also provide directions for future research. Firstly, the presented data was aggregated, thus even though we included entities from three sectors, due to limitations regarding the scope of the paper, we were unable to deepen the analysis of cooperation from this – cross-sectoral – perspective. In future empirical research, it would be worth developing this issue using parameters other than those presented here, e.g. actor centrality, in order to show, for example, the importance of entities from different sectors in cooperation. Secondly, the research did not cover all the actors involved in the development of tourism in the five municipalities, only the principal 225 actors. Although these key tourism stakeholders were selected using triangulation of data sources, less important entities (potentially also engaged in cooperation) were not included in the research. Thirdly, the study is only a 'snapshot' of the current situation in the 'Beskid Five' destination. It would be worth repeating such research in the future with the same entities in order compare the values of the parameters characterizing cooperation in the 'Beskid Five'. A further limitation is that the collected data was only quantitative, which made it possible only to quantitatively characterize the cooperation with the use of NA parameters. In the future, it would be worth carrying out analysis with both quantitative NA parameters and qualitative observations concurrently using a mixed-methods approach (see e.g. Mariani & Baggio, 2020).

Disclosure statement
The authors report that there are no competing interests to declare.

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