

# COMMUNICATION OF ENVIRONMENTAL RISK

## *The case of the Grado and Marano lagoons: analysis of media coverage and institutional activity of ARPA FVG*

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### ABSTRACT

*isk communication plays a key role in crisis management; as such, this paper aims to investigate the issue in the context of public debate linked to a specific case study. The case considered here is that of overflows at the outflow the sewage treatment plant of the city of Lignano and the discovery of contaminated shellfish in the lagoons of Grado and Marano between 1 February 2017 and 30 June 2019. The survey is structured through a quantitative and qualitative analysis of the media coverage content with a focus on the actual institutional control and monitoring activity in the affected region. Three of the main figures involved in the case were also interviewed in support of this investigation. The results confirm greater interest on the part of mass media in events capable of generating controversy with multiple exchanges between the parties involved. Within the media arena, there is a proactive behaviour by the local political sources that have, indeed, guided the debate with respect to the institutions, and the competent authorities that have taken a passive stance. This choice did not favour the formation of a suitable risk perception on the part of citizens, because, since they were not exhaustive in responding to the concerns expressed by the population, inevitably the institutions have created an environment in which the trust placed in them by the people may be undermined. An example is given by the focus on the control and monitoring activities of ARPA [regional environmental regulatory agency] that shows a considerable presence in the field with over five thousand samples aimed at protecting the environment and public health; however, this Agency was widely attacked in the media as these activities were not made clear in the subsequent debate. It is therefore essential to carry out interventions in which the processes of listening to and the participation of citizens play a central role. Paying attention to and understanding the public's concerns about the dangers to health and the environment are essential aspects of risk communication in which public bodies and institutions in Italy should invest more, thus also optimising the aspects of risk management related to communication itself and, at the same time, guaranteeing citizens the right to information. Some statements made during the interviews, as well as certain activities undertaken by the competent authorities, therefore seem to be a good omen for the future insofar as greater investment in institutional communication will surely allow for an improvement both in the relationship of trust with the population and risk management. The improvement in the latter will also improve all the economic aspects related to the acceptability of the risks themselves that, at this point in history, represent the basis for a country's growth.*

### INTRODUCTION

Given the historical period in which we are living, this article aims to investigate aspects related to the communication of environmental risk that develop in the context of public debate on a current and real case study. The case considered here is that of the spillages at the outflow of the sewage treatment plant in the city of Lignano and the discovery of contaminated shellfish in the lagoons of Grado and Marano between 1 February 2017 and 30 June 2019, the deadline set for data collection. Given the nature of the case, the study is articulated across observations of the communication dynamics between the different stakeholders involved, through an analysis of media coverage, and by carrying out a focus on the actual institutional control and monitoring activity carried out by the Regional Agency for Environmental Protection of Friuli-Venezia Giulia (ARPA FVG) in the Grado and Marano lagoons. In support of the paper, interviews were carried out with three of the main figures involved in the case.

Within the event described, there are, therefore, numerous protagonists. However, the main players around which the story was structured are: ARPA

FVG, CAFC SpA, that is, the manager of the integrated water service of central Friuli, and the Five Star Movement (Movimento Cinque Stelle, M5S) that, in Friuli-Venezia Giulia, after the regional elections of 2018, is a political party belonging to the opposition .

#### The case

The story began in 2017 with a representative of the M5S who, having been alerted by citizens, accused the sewage treatment plant of the city of Lignano of not complying with microbiological regulations regarding its output, bringing as an example some excessive levels identified by ARPA FVG during its surveillance of the plant. Subsequently, an alert was triggered involving bivalve molluscs cultivated in the lagoons of Grado and Marano. This was due to the contamination of the seafood by the same species of bacteria due to which the sewage treatment plant exceeded regulatory levels. The political party, therefore, directly accused the plant manager of being responsible for this state of affairs. The company responded by explaining that the problem is, in fact, complex, and due to the concomitant occurrence of several contamination matrices, and that, in any case, with respect to the

YEAR	MONTH	EVENT
2017	February	<ul style="list-style-type: none"> <li>M5S received complaints from citizens</li> <li>New Decree authorising the outflow of the sewage treatment plant (no.809/AMB)</li> </ul>
	June	<ul style="list-style-type: none"> <li>1st excessive level identified by ARPA at the sewage treatment plant</li> </ul>
	July	<ul style="list-style-type: none"> <li>2nd excessive level identified by ARPA at the sewage treatment plant</li> </ul>
	August	<ul style="list-style-type: none"> <li>3rd excessive level identified by ARPA at the sewage treatment plant</li> </ul>
	October	<ul style="list-style-type: none"> <li>ARPA sampling found compliant level</li> <li>M5S accused the sewage treatment plant of having excessive levels</li> </ul>
	December	<ul style="list-style-type: none"> <li>AAS No. 2 issues the first ordinances; the case grows in importance</li> </ul>
2018	May	<ul style="list-style-type: none"> <li>The M5S comments on the AAS No. 2 ordinances</li> </ul>
	June	<ul style="list-style-type: none"> <li>M5S begins to request access to ARPA documents</li> </ul>
	September	<ul style="list-style-type: none"> <li>Sergo publicly requests clarification on the matrices</li> </ul>
	October	<ul style="list-style-type: none"> <li>Excessive level identified by ARPA at the sewage treatment plant</li> <li>ARPA set up a supplementary water sampling plan. This showed compliant results everywhere except at the mouth of the Tagliamento river</li> </ul>
	November	<ul style="list-style-type: none"> <li>M5S continued to request access to documents regarding the sewage treatment plant from ARPA</li> </ul>
	December	<ul style="list-style-type: none"> <li>ARPA sampling found compliant level at the sewage treatment plant</li> </ul>
2019	January	<ul style="list-style-type: none"> <li>Sparring match between M5S and CAFC</li> <li>The Region established 2 focus groups</li> </ul>
	February	<ul style="list-style-type: none"> <li>Further sparring match between M5S and CAFC.</li> </ul>
	April	<ul style="list-style-type: none"> <li>Additional requests for access to ARPA documents from M5S</li> <li>CAFC communication to ARPA: breakage of the sewage treatment plant discharge pipe into the sea</li> <li>Issuance of temporary discharge authorisation into lagoon (No. 1795/AMB)</li> </ul>
	May	<ul style="list-style-type: none"> <li>AAS No. 2 instructed ARPA to sample the outflow into the lagoon</li> <li>Tough media attack on ARPA and CAFC</li> </ul>
	June	<ul style="list-style-type: none"> <li>Excessive level identified by ARPA at the sewage treatment plant</li> <li>Legambiente Conference on Goletta Verde data from 2019</li> </ul>

**Tab. 1** - Timeline of main events

overruns attributed to them, the company took action to resolve the situation. Throughout all this, the competent authorities rarely took a stance in relation to the solutions and activities introduced to solve the problem. This raised concern in the population involved, especially in farms dependent on the cultivation, sale and use of the shellfish themselves. It should be noted that the ordinances issued by the Healthcare Authority No. 2 (AAS No. 2) remained active for 13 months, interspersed by two breaks, one of four and one of two months, over the course of the three years during which the affair took place. On 30 June 2019, these measures are still active. Table 1 offers a summary of the main events of the story.

## **METHODOLOGY AND MATERIALS**

As already stated in the introduction, this article aims to observe and understand the communication dynamics between the different stakeholders in the context of the case study under consideration, with a focus on the institutional activity of ARPA FVG. To achieve this objective, it was decided to 1) analyse the Agency's field work on the case; 2) carry out an analysis of the media coverage offered by the regional press; 3) interview some of the representatives involved to clarify and further investigate the story. With regard to media coverage, an analysis of the content of the articles appearing in the local press was carried out. By

contrast, to outline ARPA's work, the most significant internal documents were viewed and searches were carried out through the Agency's reporting software.

### **Institutional role of ARPA FVG**

The section focused on ARPA FVG analyses the activities undertaken by the Agency in the lagoon area. The information relating to the types and methods of the aforementioned activities were obtained thanks to the current legislation that regulates them and the descriptions reported on the Agency's official website and collected during the internship activities. Finally, to obtain the data necessary to quantify the field work carried out by the different components of ARPA, the reporting software developed by SAP Business Objects was used. In addition to this, the main software of the ARPA FVG laboratory called LIMS EuSoft.Lab 10 was also used. The search analysis was carried out through the selection of prompts, that is, keywords necessary for the search itself. Below is an example: "category: e.g. sea water, product: suitability for life of shellfish, subject: Adriatic Sea - Mollusc cultivation, municipality: Lignano Sabbiadoro, year of arrival: 2015."

The data obtained was exported into Microsoft Excel software in order to better manage the analysis during the drafting of the paper.

### Content analysis

In the 1950s, the American sociologist Bernard Berelson defined content analysis as a research technique for the objective, systematic and quantitative description of the manifest content of communication. This definition has been subject to various critiques over the years, many of which have focused on the presumption of objectivity of this type of study. Indeed, a portion of the results inevitably become subjective because they are linked to the choices and interpretations of the researcher, although at least the reproducibility of the research procedures can be guaranteed. The ultimate aim is to provide the study with the necessary characteristics of intersubjectivity to allow different scholars to reach the same results by applying the same procedures. It is therefore important that the researcher explains in advance and in detail both the objectives of their investigation and the procedures for selecting and classifying the materials examined. To date, content analysis includes numerous quantitative-qualitative techniques for the study of images and texts, making it difficult to come to a single comprehensive definition. In the context of this paper, we have limited ourselves to examining its use in the analysis of written texts, applying it to articles published in the press. The objectives of this research methodology are to facilitate the analysis of a collection of texts by reducing their complexity and to deduce the relationships between the texts in question and the socio-cultural context in which they were produced, using reproducible procedures for classifying textual elements. Regarding the preceding point, content analysis is usually applied to the study of the mass media to investigate values, opinions, attitudes, prejudices and stereotypes that, in a given historical and cultural context, are prevalent in public opinion. The content analysis research design must first define the realm in which it will be carried out, i.e. choose the sources of the textual corpus that will be investigated and the timeframe within which the publications have taken place. In this article, we chose the texts published by all the regional newspapers and the press releases of the bodies involved on the case of the overruns at the Lignano sewage treatment plant and the contaminated shellfish in the lagoons of Grado and Marano. The period of time analysed for the formation of the textual corpus ranges from February 2017, the month in which the M5S claims to have received the first complaints from the population, to 30 June 2019, the deadline set for the collection of data. The next step is to outline the procedures for constructing the textual corpus, thus ensuring its reproducibility. To this end, it is necessary to consider how the aforementioned is composed of a set of analysis units, the true subject of the investigation, each of which corresponds, within this study, to a single journalistic article. Once the unit of analysis is chosen, we continue with the description of the procedure for the collection of texts. For this paper, we opted for a digital press review obtained by searching two sources capable of providing the articles of interest using appropriate keywords. These tools are the ARPA FVG intranet and the Google search engine that, to better obtain the articles published in previous years, was queried in the “news” section, setting a search by date starting from February 2017, while, for the most recent articles, we simply used keywords without any

filters. The analysis units coming from the ARPA FVG intranet were thus obtained by entering the following expressions into its search engine, found under the “communication” header and then “press review”: “Lignano sewage treatment plant”, “Grado and Marano lagoon”, “Lignano”, “Grado”. On the other hand, the following keywords were used to reach news items via Google: “ban on the consumption of Lignano shellfish”, “Salmonella Lignano”, “CAFC Lignano”, “Friuli shellfish”, “FVG clams”, “Lignano sewage treatment plant”, “Lignano lagoon emergency”. It should be remembered that this research methodology for the creation of the text corpus, despite the use of keywords capable of ensuring reproducibility, is not completely free from the subjectivity of the researcher, both for the choice of the keywords themselves, and for the need to evaluate the texts as more or less relevant for the ongoing research, thus deciding on their possible inclusion or exclusion. However, if the object of study has been well delineated, this subjectivity affects a small portion of the articles, thus becoming negligible. The full text corpus is presented in Table 2. It consists of 39 journalistic articles published between 1 February 2017 and 30 June 2019. Each analysis unit reports the date of publication, the author (if any), the newspaper, the title and the link to the article page (where possible).

The last phase of the content analysis is the definition of the survey parameters, also called codes, on the basis of which the texts will be classified. It is therefore a question of defining the so-called coding frame, that is, the interactive process through which each unit of analysis will be uniquely classified according to the codes used. These survey parameters may include open answers (for example the title, the author or the header to which they belong) or closed answers (for example the presence or absence of a terminology item, images), but the values that can be attributed to them must have exclusive characteristics. Finally, codes must be chosen in such a way as to guarantee independence between them, i.e. the value of a single code must not influence that of others. At this point, the qualitative-quantitative analysis of the body of text has taken shape and the research requirements that define the text classification parameters will depend on the achievement of more or less significant results with respect to the hypotheses and objectives of the survey.

### Interviews

As for the interviews, as already specified, they are able to clarify and deepen some issues dealt with through a conversation with some of the subjects involved. Specifically, interviews were held with: Dr. Marco Gani, head of the institutional communication function and press office of ARPA FVG; the regional councillor of Friuli-Venezia Giulia, XII Legislature; Cristian Sergo, a member of the M5S; a *Messaggero Veneto* journalist, Francesca Artico, who wrote several articles on the case. In principle, we had also contacted CAFC SpA to organise an interview with one of its representatives, but the company’s communication contact stated that the official information relating to the specific case can be viewed on the company website.

The type chosen for these interviews is defined as semi-structured because it is able to remain open to

DATE	AUTHOR	HEADER	TITLE	LINK	LINK VISITED ON
27/10/2017	Luana de Francisco	Messaggero Veneto	ARPA fines the Lignano sewage plant	No	
29/10/2017	Viviana Zamarian	Messaggero Veneto	Municipality calls for an assembly on sewage plant	No	
31/10/2017	No	Messaggero Veneto	Sergo (M5S): "Oversights on the part of the Province"	No	
15/05/2018	Drafting	UdineToday	The ban on the direct consumption of seafood from Lignano Pineta is still in force	<a href="http://www.udinetoday.it/politica/m5s-sergo-divieto-consumo-diretto-molluschi-mare-di-lignano.html">http://www.udinetoday.it/politica/m5s-sergo-divieto-consumo-diretto-molluschi-mare-di-lignano.html</a>	14/04/2019
30/05/2018	No	Il Piccolo	Focus on food safety of molluscs	No	
07/06/2018	No	Il Piccolo	Molluscs, more safety without penalising fishing	No	
20/09/2018	No	Messaggero Veneto	Shellfish harvesting: no more Sergio ordinances: we deserve it	No	
13/10/2018	Drafting	UdineToday	After 4 years, salmonella returns to the clams of our region	<a href="http://www.udinetoday.it/cronaca/salmonella-molluschi-m5s-vongole-laguna-lignano-sabbia-doro-2018.html">http://www.udinetoday.it/cronaca/salmonella-molluschi-m5s-vongole-laguna-lignano-sabbia-doro-2018.html</a>	14/04/2019
17/10/2018	No	ARPA FVG news archive	Water and shellfish sampling in Lignano	<a href="http://www.arpa.fvg.it/cms/hp/news/index.html?page=18">http://www.arpa.fvg.it/cms/hp/news/index.html?page=18</a>	14/04/2019
17/10/2018	No	IlFriuli.it	Shellfish: bacteria alert	<a href="http://www.ilfriuli.it/articolo/Cronaca/Molluschi-points_alar-me_per_la_presenza_di_batteri/2/187590">http://www.ilfriuli.it/articolo/Cronaca/Molluschi-points_alar-me_per_la_presenza_di_batteri/2/187590</a>	14/04/2019
17/10/2018	Drafting	UdineToday	Salmonella and escherichia coli in the water of Lignano in ARPA samples	<a href="http://www.udinetoday.it/cronaca/analisi-arpa-salmonella-escherichia-coli-acqua-lignano-sabbia-doro.html">http://www.udinetoday.it/cronaca/analisi-arpa-salmonella-escherichia-coli-acqua-lignano-sabbia-doro.html</a>	14/04/2019
17/10/2018	Francesca Artico	Messaggero Veneto	Shellfish, prohibition of harvesting up to Lignano	No	
17/10/2018	ARC/ARPA/Red	regione.fvg.it	Environment: ARPA, water and shellfish sampling in Lignano	No	
18/10/2018	Antonella Lanfrit	Il Gazzettino	"Lignano, bacteria all along the coast"	No	
18/10/2018	No	Messaggero Veneto	ARPA starts further laboratory analysis sampling this weekend	No	
18/10/2018	Francesca Artico	Messaggero Veneto	Ban on shellfish and clam sales dwindle in Marano	No	
21/10/2018	Drafting	UdineToday	Contaminated shellfish water analysis: Lignano approved, Tagliamento rejected	<a href="http://www.udinetoday.it/cronaca/molluschi-contaminati-le-analisi-lignano-in-passato-nel-tagliamento-alte-concentrazioni-batterie.html">http://www.udinetoday.it/cronaca/molluschi-contaminati-le-analisi-lignano-in-passato-nel-tagliamento-alte-concentrazioni-batterie.html</a>	14/04/2019
21/10/2018	Francesca Artico	Messaggero Veneto	Contaminated shellfish in lagoon drop in Legambiente area	No	
22/10/2018	No	ARPA FVG news archive	ARPA water analysis in Lignano: first results	<a href="http://www.arpa.fvg.it/cms/hp/news/index.html?page=18">http://www.arpa.fvg.it/cms/hp/news/index.html?page=18</a>	14/04/2019
22/10/2018	No	Messaggero Veneto	ARPA analyses sea water: there are no dangerous bacteria	No	
22/10/2018	ARC/ComArpa/EP	regione.fvg.it	Environment: Lignano seawater analysis rules out bacterial contamination	No	
01/11/2018	Fabio Folisi	friuliserà.it	Lignano Sabbia doro sewage plant: possibly not fit for purpose. In the past, the limits of escherichia coli better known as "poop" had been exceeded	<a href="https://friuliserà.it/depuratore-di-lignano-sabbia-doro-ce-il-dubbio-che-sia-insufficiente-in-passato-erano-stati-superati-i-limiti-di-escherichia-coli-meglio-nota-come-cacca/">https://friuliserà.it/depuratore-di-lignano-sabbia-doro-ce-il-dubbio-che-sia-insufficiente-in-passato-erano-stati-superati-i-limiti-di-escherichia-coli-meglio-nota-come-cacca/</a>	14/04/2019

30/11/2018	Fabio Folisi	friuliseria.it	Marano lagoon and the Lignano sewage treatment plant. Allegations of contamination by a young biologist-fisherman are also confirmed in some aerial photos	No	
22/01/2019	No	IlFriuli.it	Sparing match regarding the Lignano sewage treatment plant	<a href="http://www.ilfriuli.it/articolo/cronaca/botta-e-risposta-sul-depuratore-di-lignano/2/192122">http://www.ilfriuli.it/articolo/cronaca/botta-e-risposta-sul-depuratore-di-lignano/2/192122</a>	14/04/2019
23/01/2019	Lisa Zancaner	Il Gazzettino	Lignano, controversy over the sewage treatment plant	No	
23/01/2019	Nicoletta Simoncello	Messaggero Veneto	“Lagoon contaminated by wastewater: fault of the sewage treatment plant”	No	
23/01/2019	Giulio Garau	Il Piccolo	Clam farms halted but there are no more on the island	No	
23/01/2019	No	Il Piccolo	The Region establishes two “focus groups” on the shellfish case	No	
12/02/2019	No	ARPA FVG news archive	Aquafarm 2019	<a href="http://www.arpa.fvg.it/cms/hp/news/index.html?page=12">http://www.arpa.fvg.it/cms/hp/news/index.html?page=12</a>	14/04/2019
18/02/2019	Drafting	Trieste All News	Sergo (M5S): “Shellfish ban, ARPA finds salmonella in the Lignano sewage treatment plant”	<a href="https://www.triesteallnews.it/2019/02/18/sergo-m5s-molluschi-vietati-arpa-trova-salmonella-nel-depuratore-di-lignano/">https://www.triesteallnews.it/2019/02/18/sergo-m5s-molluschi-vietati-arpa-trova-salmonella-nel-depuratore-di-lignano/</a>	14/04/2019
18/02/2019	Drafting	Trieste All News	Lignano sewage treatment plant, CAFC replies to M5S: “Sergo should do his research”	<a href="https://www.triesteallnews.it/2019/02/18/depuratore-lignano-cafc-replica-al-m5s-sergo-dovrebbe-studiare-meglio-le-carte/">https://www.triesteallnews.it/2019/02/18/depuratore-lignano-cafc-replica-al-m5s-sergo-dovrebbe-studiare-meglio-le-carte/</a>	14/04/2019
14/04/2019	Francesca Artico	Messaggero Veneto	Fewer and fewer clams at sea, shellfish consortium in crisis	<a href="https://messaggeroveneto.gelocal.it/udine/cronaca/2019/04/14/news/sempr-meno-vongole-in-mare-consorzio-molluschi-in-crisi-1.30190847">https://messaggeroveneto.gelocal.it/udine/cronaca/2019/04/14/news/sempr-meno-vongole-in-mare-consorzio-molluschi-in-crisi-1.30190847</a>	14/04/2019
06/05/2019	Fabio Folisi	friuliseria.it	Lagoon and coastline emergency, more than just “blue flags”. New photos show another story, one of contamination and inaccuracy/ Gallery at the bottom	<a href="https://friuliseria.it/emergenza-laguna-e-litorali-altro-che-bandiere-blu-nuove-foto-mostrano-altra-storia-una-brutta-storia-di-inquinamento-e-pressapochismo-gallery-in-calce/">https://friuliseria.it/emergenza-laguna-e-litorali-altro-che-bandiere-blu-nuove-foto-mostrano-altra-storia-una-brutta-storia-di-inquinamento-e-pressapochismo-gallery-in-calce/</a>	06/05/2019
06/05/2019	Drafting	Trieste All News	Sergo (M5S): “Lignano sewage treatment plant spills into the lagoon, shellfish harvesting banned”	<a href="https://www.triesteallnews.it/2019/05/06/sergo-m5s-depuratore-di-lignano-sversa-in-laguna-vietata-la-raccolta-dei-molluschi/">https://www.triesteallnews.it/2019/05/06/sergo-m5s-depuratore-di-lignano-sversa-in-laguna-vietata-la-raccolta-dei-molluschi/</a>	06/05/2019
23/06/2019	Drafting	friuliseria.it	“Goletta Verde” sets off from Friuli. Will the tests show a “Miracle in Lignano”? Will it be discovered that the excrement is aseptic and does not require purification?	<a href="https://friuliseria.it/goletta-verde-parte-dal-friuli-le-analisi-dimosteranno-un-miracolo-a-lignano-si-scoprirà-che-le-deiezioni-tettoniche-sono-asettiche-e-non-necessitano-di-depurazione/">https://friuliseria.it/goletta-verde-parte-dal-friuli-le-analisi-dimosteranno-un-miracolo-a-lignano-si-scoprirà-che-le-deiezioni-tettoniche-sono-asettiche-e-non-necessitano-di-depurazione/</a>	23/06/2019
26/06/2019	Drafting	friuliseria.it	Why is Goletta Verde promoting the FVG sea if critical issues exist? The situation is not tragic... it is not even serious	<a href="https://friuliseria.it/perche-goletta-verde-promuove-il-mare-del-fvg-se-le-criticita-esistono-la-situazione-non-e-tragica-ma-non-e-nep-pure-seria/">https://friuliseria.it/perche-goletta-verde-promuove-il-mare-del-fvg-se-le-criticita-esistono-la-situazione-non-e-tragica-ma-non-e-nep-pure-seria/</a>	28/06/2019
26/06/2019	Drafting	friuliseria.it	Sergo M5s: “Goletta Verde data in line with those of ARPA. But problems remain.”	<a href="https://friuliseria.it/sergo-del-m5s-dati-di-goletta-verde-in-linea-con-quelli-di-arpa-ma-i-problemi-rimangono/">https://friuliseria.it/sergo-del-m5s-dati-di-goletta-verde-in-linea-con-quelli-di-arpa-ma-i-problemi-rimangono/</a>	28/06/2019
26/06/2019	No	Udine20.it	Goletta Verde monitoring in Friuli-Venezia Giulia	<a href="http://www.udine20.it/il-monitoraggio-di-goletta-verde-in-friuli-venezia-giulia/">http://www.udine20.it/il-monitoraggio-di-goletta-verde-in-friuli-venezia-giulia/</a>	28/06/2019
26/06/2019	Drafting	UdineToday	Goletta Verde awards Lignano Sabbiadoro beach	<a href="http://www.udinetoday.it/cronaca/goletta-verde-lignano-26-giugno-2019.html">http://www.udinetoday.it/cronaca/goletta-verde-lignano-26-giugno-2019.html</a>	28/06/2019

Tab. 2

the highlighting, by the interviewees, of issues that had not been considered in the first place by the interviewer, thus allowing for a more incisive integration of the story. This method allows the questions not to be restricted to a specific number or topic. On the contrary, if the possibility of investigating a further context is created, the interviewer is free to do so. In addition, if problems are encountered such as to compromise the continuation of the interview, the answer to a partial number of questions is also accepted. The structure of the conversations thus includes eight questions per subject. The first half is asked to all respondents, while the next four questions are specific to the context, thus varying from person to person. The maximum duration of each interview is set at around 45 minutes. For the carrying out of the interview, face-to-face meetings or telephone calls are accepted in line with the availability of the interviewee and the interviewer. All interviews were recorded and transcribed by the interviewers.

## ■ RESULTS AND DISCUSSION

### ARPA: actual activity in the field

The lagoons of Grado and Marano that “constitute the transition complex located along the northernmost stretch of the Adriatic Sea and fall within the Venetian lagoon system that develops from the Po delta to the mouth of the Isonzo” are, therefore, involved in a series of controls and monitoring by ARPA designed to assess and preserve the complexity of the delicate ecosystems. This activity is subject to the provisions of current legislation and in particular Articles 118 and 121 of Legislative Decree no. 152/2006. These articles have the purpose of evaluating water quality through programmes to detect the characteristics of the river basins, in fact-finding missions allowing the Regions to set up water protection plans. In these plans, through the use of the data obtained from the fact-finding missions, the monitoring and controls of the water bodies are scheduled and developed for the achievement or maintenance of the quality objectives set by the Region itself. In addition, the transposition of Directive 2008/56/EC (Marine Strategy), enacted through Legislative Decree 190/10, affects the activity in the lagoon. Indeed, Member States are required to draw up a marine strategy based on an initial assessment, the definition of a favourable environmental status, the identification of environmental targets and the establishment of monitoring programmes for the achievement of the latter.

The Agency also carries out works to monitor bathing water, pursuant to Legislative Decree no.116 of 2008 which requires monitoring and control during the bathing season set by the Ministry of Health from 1 May to 30 September. The Consolidated Environmental Text (TEU) also identifies the general and methodological criteria for the detection of the qualitative characteristics of water and for the calculation of its compliance or otherwise with the life of shellfish. These criteria apply to coastal and transitional waters in order to allow for the cultivation of shellfish and to contribute to the good quality of shellfish products intended for human consumption. The water monitoring programmes just mentioned include most of the areas classified by Regional Health for shellfish farming; therefore, monitoring is applicable as defined by the health regulations featured in the “hy-

giene package”.

Table 3 represents the total activities carried out by the Agency in the lagoon area over the period from 2015 to 30 June 2019. It does not include all the activities of the sewage treatment plants; only the Lignano plant is shown by way of example, and we have also excluded the values collected from the continuous sampling of the transition waters. To simplify, therefore, only the sampling performed manually by ARPA personnel were considered.

Summing up, this in-depth analysis made it possible to observe the activities undertaken by the Agency in the lagoon area and on the sewage treatment plant which, based on the public debate, were not very clear. Numerous attacks were launched against ARPA in the media regarding the control and monitoring service provided on the area involved in the case in question; however, what emerges from this analysis is considerable activity in the field, with over five thousand samples taken, aimed at protecting the environment and public health.

### Analysis of media coverage

The content analysis made it possible to collect a text corpus composed of 39 journalistic articles published between 1 February 2017 and 30 June 2019 on which a quantitative and qualitative survey was conducted. The survey parameters on which the quantitative analysis was focused were the temporal trend of the publications and the identification of the various sources that took part in the debate. The qualitative analysis focused instead on the communication strategy of stakeholders within the debate and on the classification of journalistic frameworks to identify the main topics of discussion.

The temporal trend of publications refers to the counting of the number of texts published by each newspaper per day/month/year. On the basis of this definition, the texts from the local newspapers that dealt with the case from 1 February 2017 to 30 June 2019 were counted. The frequency of publications shows how the issue was initially paid little attention by the media (only 3 articles in 2017), while it increased the following year with 20 articles and finally remained relatively constant in 2019 with 16 publications (Table 4). Going into more detail, Figure 1 shows that, over the course of 2017, at the beginning of the story, the 3 articles were all published in October, when the M5S monitoring concluded, having begun in February with the reports from citizens, and the local newspapers began to take an interest in the story. During the following year, the publications resumed in May to report on the ordinances prohibiting the collection and direct consumption of shellfish from AAS No. 2. The following summer was uneventful, with just one publication about it. The case blew up once again in late September, again reporting on the ordinances that had initially been withdrawn and then reissued in October. In fact, the majority of 2018 articles were concentrated over the latter month, as many as 14, while in November press attention once again dwindled (2 articles). The publications for 2019 have a different trend compared to the previous year. Indeed, they begin in January, before maintaining a certain consistency, with an average of approximately 3 texts per month, until June, when our sample ends.

From the observation of the temporal trend, moreo-

ACTIVITIES	2015	2016	2017	2018	2019	TOTAL
Monitoring of marine-coastal and transitional water quality	317	365	233	255	137	1307
Sampling and analysis of marine sediments	117	129	144	130	53	573
Checks on the fitness for life of shellfish	750	594	641	647	373	3005
Monitoring of consortium water engines (Draining basins)	20	10	0	25	10	65
Monitoring the discharge of sewage treatment plants	6	5	5	7	2	25
Bathing water monitoring	144	146	144	146	72	652
TOTAL	1354	1249	1167	1210	647	5627

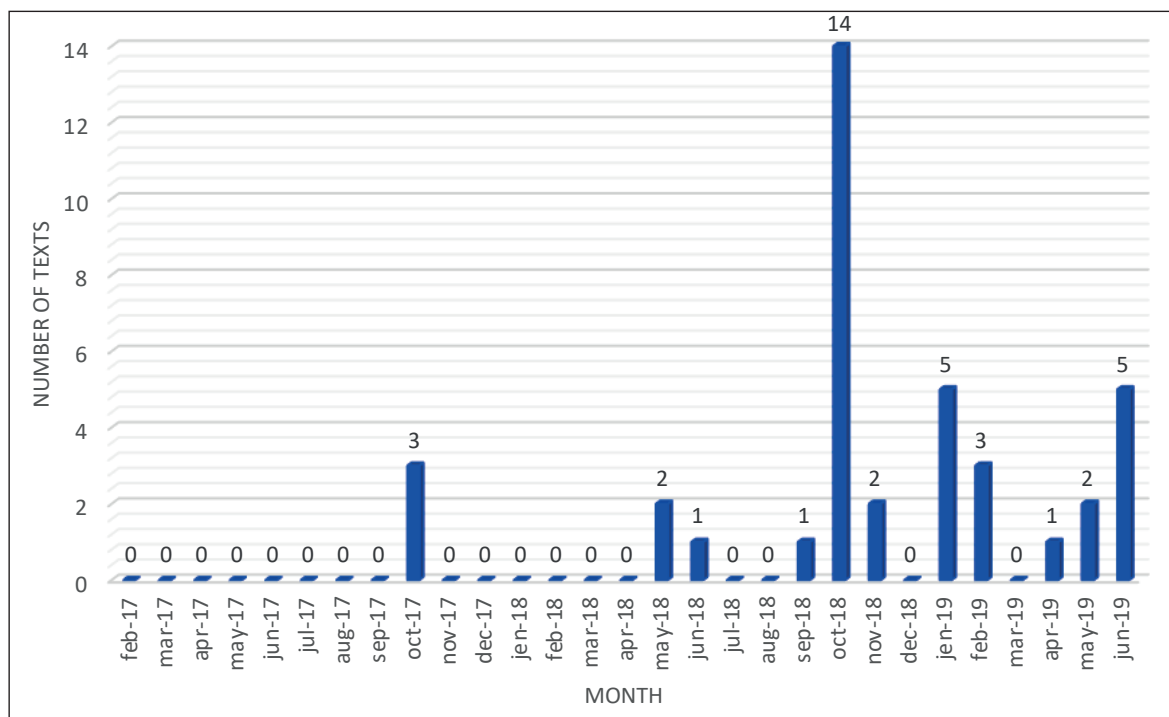
**Tab. 3** - Summary of ARPA activity in the lagoon from 2015 to 30.06.2019.

ver, we may observe that the majority of the publications over the three years (28 articles out of 39) were published at the end of the bathing season (the latter is set by the Ministry of Health from 1 May to 30 September). Therefore, the risk was more frequently discussed at a distance from the period of possible maximum direct exposure of the population to bacteria. In this regard, Councillor Sergio, during the interview, said that *“My decision to hold press conferences in this specific period [...] is due to the fact that certain information came into my possession during that period. For example, to obtain the results of a test report, for shellfish or for the sewage plant, a minimum of a month or two is required. So if ARPA does the sampling in July and issues the report in September, it comes to me in October. So there was no choice of disclosure so as not to affect the bathing period. When information was released, even in summer, we communicated it anyway because it was the right thing to do with regard to the citizens.”*

The identification of the sources that took part in the debate was built considering as the “source” of an article the person interviewed or cited or to whom an opinion referred to in the publication is attributed; what is important, however, is the explicit citation of the subject, whether it is an individual or a body. In this way, articles have been found that report a single source and others that contain more than one; therefore, the count placed more importance on the texts with the greatest number of references. The result, shown in Table 5, shows a wide distribution of players having taken part in the debate: simple citizens (traders, fishermen), various associations (environmental, purpose, business), consortia such as COGEMO (Consortium for the management of shellfish at sea) and CONOU (National Consortium for the Management, Collection and Treatment of Used Mineral Oils), a young biologist (Cristiano Mauro), CAFCA, ARPA, the FVG Region, AAS No.2, the municipality of Lignano and finally the M5S.

Month	Number of articles in 2017	Number of articles in 2018	Number of articles in 2019
January	0	0	5
February	0	0	3
March	0	0	0
April	0	0	1
May	0	2	2
June	0	1	5
July	0	0	0
August	0	0	0
September	0	1	0
October	3	14	0
November	0	2	0
December	0	0	0
TOTAL	3	20	16

**Tab. 4** - Number of texts published annually



**Fig. 1** - Temporal trend of publications (February 2017 – 30 June 2019)

If we group the different sources by the groups to which they belong, as in Figure 2, what emerges is a clear political and institutional prevalence with a recurrence of 32% for both, followed by associations with 18%, the entities involved (7%) and gradually all the others. Observing the results of the main stakeholders, the M5S appears 18 times (31.6%) as a reference versus 9 times (15.8%) for ARPA, the top institution mentioned; lastly, CAFC SpA stands at 7.0%. A further observation on the main sources has brought to light an important fact: we may note that the M5S speaks through C. Sergio, the Region through the councillor for environmental protection, F. Scocimarro, and the CAFC through its managing director, while ARPA has relied on impersonal press releases.

The latter choice seems less effective since, in the communication of risk, the role of the spokesperson is essential since they not only speak on behalf of the institution, but allows it to be “personified”. Giving a face and a voice to the latter allows people to place more trust in it, as we are more open to a real person rather than an abstract institution.

It is, therefore, clear that, even in the case examined here, the mass media offered an arena for discussion on risk management that has involved all stakeholders, giving a voice to both the institutions and the different groups involved. That is why the most popular publications were those where the debate was more heated, that is to say when a large number of subjects participated.

SOURCES	RECURRENCES	PERCENTAGES
M5S	18	31.6
Restaurants	1	1.8
Fishermen	2	3.5
COGEMO	1	1.8
Cristiano Mauro	2	3.5
CAFC S.p.A.	4	7.0
ARPA FVG	9	15.8
AAS No.2	2	3.5
FVG Region	5	8.8
Municipality of Lignano	2	3.5
LegaCoop FVG	1	1.8
Legambiente	7	12.3
CONOU	1	1.8
Temporary Association	2	3.5
TOTAL	57	100.0

**Tab. 5** - Type of sources and their recurrences in the textual corpus



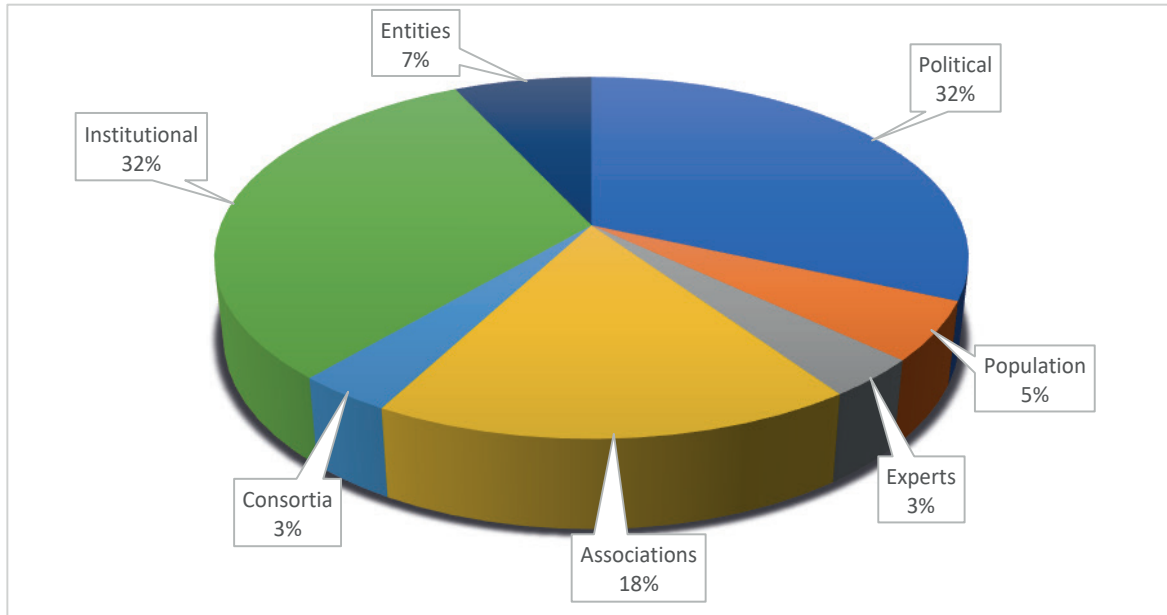


Fig. 2 - Classification of sources by type

With regard to the communication strategy of the stakeholders within the debate, the analysis focused on the propensity of the different stakeholders to adopt a proactive and more direct communication strategy to get their view across, or a passive strategy, making comment in the media only if called into question. As can be seen from Figure 3, the textual corpus can be broken down into a rather large portion containing the texts in which the stakeholders showed a proactive or passive attitude. The remaining material is represented by simple reports.

In this 85% of the material, composed of 33 units of analysis of a total of 39, we can observe 20 articles containing what until now has been defined as proactive behaviour, that is, all the criticism, accusations, complaints, etc. used by some stakeholders to remain, in a way, protagonists of the debate and to guide it. By contrast, 13 of the 39 texts are a platform for responses, expressing a more passive attitude; however, responses were not always given, and as a result they are fewer in number. The analysis shows that the M5S is responsible for the largest number of proactive articles, as many as 13 of the 20, followed by the general population and the editorial staff of the media outlets who have published 3 texts each; lastly, Legambiente generated only one article of this type. To better understand the extent of this behaviour, articles with the same content published in different newspapers were excluded from the count: the M5S is still the stakeholder that effectively held the reins of the debate with 12 articles; the numbers of the other active players remain unchanged. If we observe the targets of these criticisms, accusations, complaints, etc., the first group to stand out are the institutions (ARPA FVG, AAS No.2 and the Region), which are dealt with in 14 articles out of 20, followed by the CAFC with 10, then Legambiente with 2 and finally the M5S, which appears only once. Since in each article classified as proactive, one or more stakeholders are called into question, there are more citations than the total number of texts of this type. Regarding the answers giv-

en, according to the results of the analysis, it can be said that there was a certain reluctance on the part of the players involved in countering the attacks. That said, Figure 4 shows the stakeholders who have answered more or less directly to the accusations. First, it would seem that ARPA is the body with the largest number of pieces published by way of response (6 articles), followed by the CAFC (4 articles) and, lastly, the Region (3 articles). Here, once again, we applied the technique of removing the same articles present in several newspapers, and we observe a drastic change between the hierarchies represented in red. Indeed, the Agency falls to the last place with only 2 rebuttal articles while the CAFC and the Region have 3 articles each. What emerges, therefore, is a certain detachment of the ARPA from the media controversy involving it. Despite the many attacks, it did not appear to feel the need to comment directly, for example by specifying its activity, except on rare occasions, as occurred with the establishment of the supplementary sampling plan.

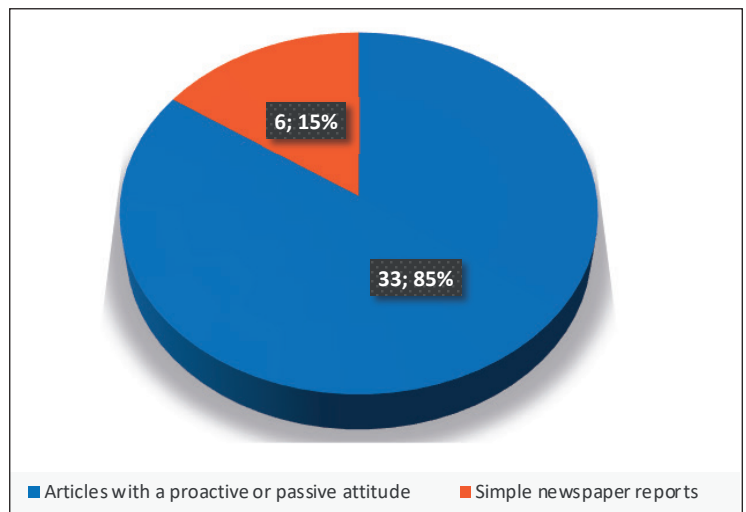
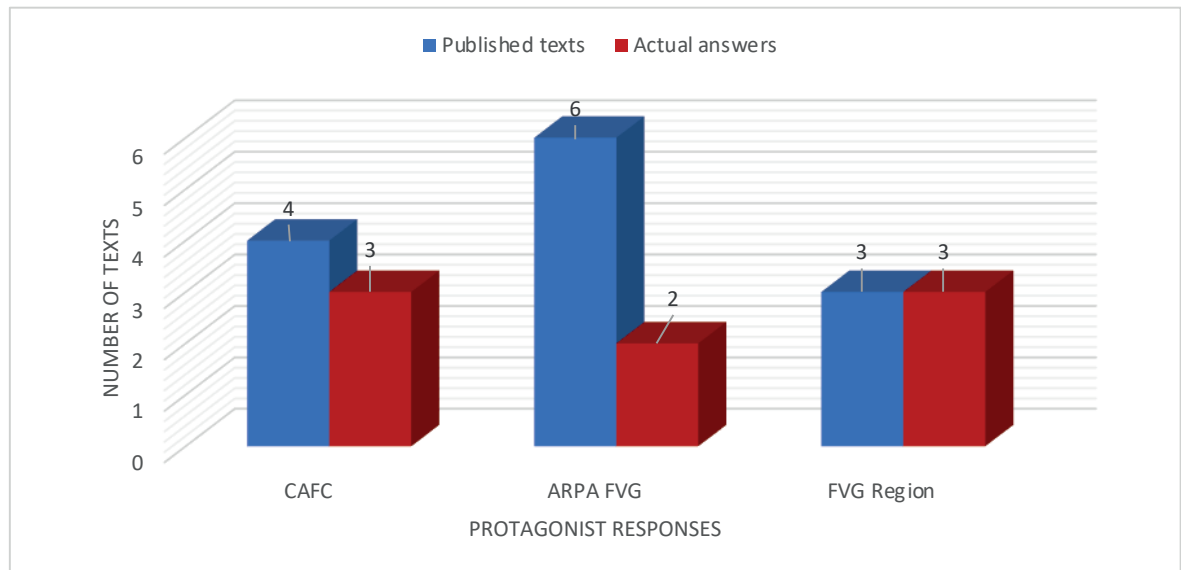


Fig. 3 - Classification of the articles contained in the text corpus



**Fig. 4** - Classification of the responses given

Another noteworthy fact, regarding the answers given by the institutions, is related to the communication of the activation of certain countermeasures, such as the focus groups set up by the Region. The underlying problem is the failure to give updates on the progress of these countermeasures intended to shed light on the case. If we look at the published articles in more detail, we may note, in the final texts from late June, specific requests which, precisely, regarded the activities of the institutions, such as:

- Has the Lignano plant been completed and is it operating in a biological regimen as provided for by the transposition of the European Directives of 1991 and the most recent ones of 1999 and 2006 in order to guarantee the required level of water quality? Are the investments declared to the press by the CAFC, which up to now have exceeded 6 million euros, consistent with a plan approved by the Region and have they now been concluded? Has the ARPA identified the cause of the frequent presence of *escherichia coli* in shellfish in the lagoon and at sea in the area accessible to swimmers? Has the ASL made any kind of comment? Has the Municipality of Lignano, over the course of the meetings that have been reported in the press, been properly informed and has it been able to understand the causes and solutions of the problems in order to assume the protective role in the region to which it is entitled by law? Did the task force announced by the regional councillor and the studies of the CAFC with the Institute of Experimental Oceanography (Ogs) come about? Or did they remain as unmet needs? Have the checks been intensified and deepened after the complaints of the excessive levels to the manager?

**Sergo also commented on this in his last published article:**

After raising the issue for two and a half years, there is still no official word on the origins and causes of the spills, nor even on the irreversible reduction of seafood.

In this way a considerable risk is created. Indeed, ig-

norning the concerns and needs of the public or avoiding confrontation inevitably leads to an undermining of citizens' trust in institutions.

This issue was also pointed out by Francesca Artico, a journalist of the *Messaggero Veneto*, as emerges from the interview: *“Communication is lacking even with regard to ARPA, which offers brief answers only if strongly called into question. I would not speak of harm, but the people are certainly losing faith in institutions. For example, the healthcare authority [...] could also take a position on the matter; but even here, if not strongly called into question, the latter does not offer comment.”*

Moving on to the analysis of journalistic frames, we can define framing as the positioning of news within an interpretative framework that organises and contextualizes the facts reported by emphasising (or excluding) parts of them. It is similar to assuming a point of view that suggests a certain causal interpretation or a moral assessment of what has happened. In order to identify the various journalistic frameworks, we therefore read the articles of the textual corpus, looking for the interpretative frameworks used, in support of which we used the various topics constituting the news items. It was possible to observe the presence of at least one frame per article, but often more than one was identified, in a similar manner to the source analysis. Having said that, Table 6 summarises the main topics of discussion in the context of the disputes over the case of the overflows at the Lignano sewage treatment plant and the discovery of contaminated shellfish in the lagoons of Grado and Marano. The results clearly express a considerable articulation of the debate, intertwining the various scientific, political, economic and safety aspects.

By dividing the frames into broader categories, the macro-frames, we can see how the debate takes on five main dimensions: economic, environmental risks, health risks, political-social and technical-scientific. What emerges from the analysis is a prevalence of the debate on the political-social issues that prevail over those related to risks to health and the environment (Table 7).

FRAME	RECURRENCES	PERCENTAGES
Lignano sewage treatment plant anomalies	12	11.1
Shellfish food safety	12	11.1
Research into the causes and people responsible for the contaminated shellfish	11	10.2
Accusations against the institutions	9	8.3
economic impact on businesses	9	8.3
The ARPA supplementary sampling plan	9	8.3
Bathing safety	7	6.5
Clarification request for citizens	6	5.6
Human pressures on the lagoon	6	5.6
The Goletta Verde 2019 inquiry (Legambiente)	5	4.6
economic impact on public expenditure	4	3.7
Countermeasures taken by the CAFC	4	3.7
Desire to silence the story	4	3.7
The Region takes action on the problem	4	3.7
The complaint against Legambiente	2	1.9
Legambiente Credibility	2	1.9
The situation of shellfish in Grado	1	0.9
Discrediting of the CAFC	1	0.9
TOTAL	108	100

**Tab. 6** - *Journalistic frames*

In summary, the results of the quantitative and qualitative analysis of the media coverage of the case examined confirm a greater interest of the mass media in events capable of generating controversy rich in exchanges between the parties involved, so much so that the majority of the articles analysed constitute sparring matches. Within the media arena, there is a proactive behaviour on the part of the local political sources that have, indeed, guided the debate with respect to the institutions, the competent authorities and the CAFC that have, by contrast, refrained from making comment. The latter, by showing a degree of reluctance in countering the accusations, have therefore decided to take some risks regarding citizens' trust

in them. Finally, it was noted that the debate focused more on issues of a political and social nature, placing less emphasis on health and the environment. This is definitely the result of the fact that the ranks of the public debate were held by only one stakeholder, the M5S, while the other stakeholders mostly remained passive.

A key element also emerges, namely a lack of communication clarity on the part of the institutions, the competent authorities and the CAFC. As highlighted by the journalist of *Messaggero Veneto*, Francesca Artico "the crisis has not been handled very well. [...] From a communicative point of view, I can say that there is a lack of clear and comprehensible com-

MACRO-FRAMES	RECURRENCES	PERCENTAGES
Economic impact (on public expenditure and businesses)	13	12.0
Technical-scientific (the ARPA supplementary sampling plan, the 2019 Goletta Verde inquiry)	14	13.0
Health risks (Bathing safety, Shellfish food safety)	19	17.6
Risks to the environment (Abnormalities at the sewage treatment plant, human pressures on the lagoon, the shellfish situation in Grado)	19	17.6
Politico-social (The countermeasures adopted by the CAFC, Accusations against the institutions, clarification requests for citizens, the search for those responsible and the causes of the contamination of the shellfish, the complaint against Legambiente, the desire to silence the story, the Region takes action on the problem, discrediting of the CAFC, Legambiente credibility)	43	39.8
TOTAL	108	100

**Tab. 7** - *Journalistic macro-frames*

munication by all stakeholders. This is because it is easy to use an array of technicisms, but we must also make the story understandable for “ordinary people” who do not understand these terms, but still need to form their own opinion on the matter.” We must also bear in mind how the population of Lower Friuli is particularly sensitive to environmental issues, given the historical events due to the Torviscosa industrial site, and this is confirmed by the statements made by Artico: “In this region, for more than thirty years, there have been committees dealing with the environment and when they announce conferences, meetings, etc. there is a big response from the population”.

The choice of the institutions to take a passive stance in public debate certainly did not favour the formation of a suitable risk perception on the part of citizens, because, since they were not exhaustive in responding to the concerns expressed by the population, inevitably the institutions have created an environment in which the trust placed in them by the people may be undermined. This interpretation is confirmed in the words of Dr. Marco Gani of ARPA FVG who, called to answer regarding the possibility of speculation and repercussions on the Agency’s reputation due to this attitude, stated “Absolutely. I have seen concrete evidence from other cases too, such as, for example, the cement plant in Fanna: when we lowered our attention we had significant media repercussions, which are difficult to recover from.”

Finally, the results show the strong involvement of certain political players, with their supporting arguments. This is because in the so-called “risk society”, it is impossible to externally attribute at-risk situations to any one body. In other words, the risks depend on human decisions, and since they are produced on an industrial scale, they reflect on the political sphere. Therefore, in cases of crisis or emergency, politics carves out a significant degree of responsibility towards citizens, as Gani also confirms: “politics must have two roles: one to inspire, to bring out the problems by whistle-blowing in the media, and a second relating to finding solutions.” And again from Sergio: “Political decision-makers [...] should first ask themselves what are the sources of any dangers and worry about mitigating the damage, but also prevent these dangers from being perpetrated over time. [...] Fur-

thermore, I believe that they must clearly involve all the relevant people [...] but above all politics must provide the means for these institutions to play their role”.

To conclude, this case study has allowed us to confirm how risk communication plays a fundamental role in the management of a crisis. Indeed, the decision not to participate proactively in the debate by those in charge of risk management has a negative impact on all other stakeholders, and in particular on citizens, since they entrust their safety to others. It is therefore essential to carry out interventions in which the processes of listening to and the participation of citizens play a central role. Paying attention to and understanding the public’s concerns about the dangers to health and the environment are essential aspects of risk communication in which public bodies and institutions in Italy should invest more, thus also optimising the aspects of risk management related to communication itself and, at the same time, guaranteeing citizens the right to information. Therefore, ARPA FVG’s choice to place more emphasis on improving its communication strategy by investing in techniques and tools that have not been used very much so far seems virtuous, as stated by Gani: “The ideal tool would be a periodic informative magazine, also published via the web, but that keeps up with the times”. The head of the institutional communication function and press office of ARPA FVG also said: “We would like to increase direct proactive communication, involving citizens more with conferences, meetings, etc. in the areas where the problems are present, allowing ARPA technicians to speak directly to the population. We are moving in this direction. For example, this year, we held a stand at the Barcolana where we illustrated and explained certain activities”.

These statements and the activities undertaken seem to be a good omen for the future insofar as greater investment in institutional communication will surely allow for an improvement both in the relationship of trust with the population and risk management. The improvement in the latter will also improve all the economic aspects related to the acceptability of the risks themselves that, at this point in history, represent the basis for a country’s growth.

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