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MITIGATING CONFLICTS IN COASTAL AREAS THROUGH SCIENCE DISSEMINATION

Fostering Dialogue between Researchers and Stakeholders

edited by
Armando Montanari

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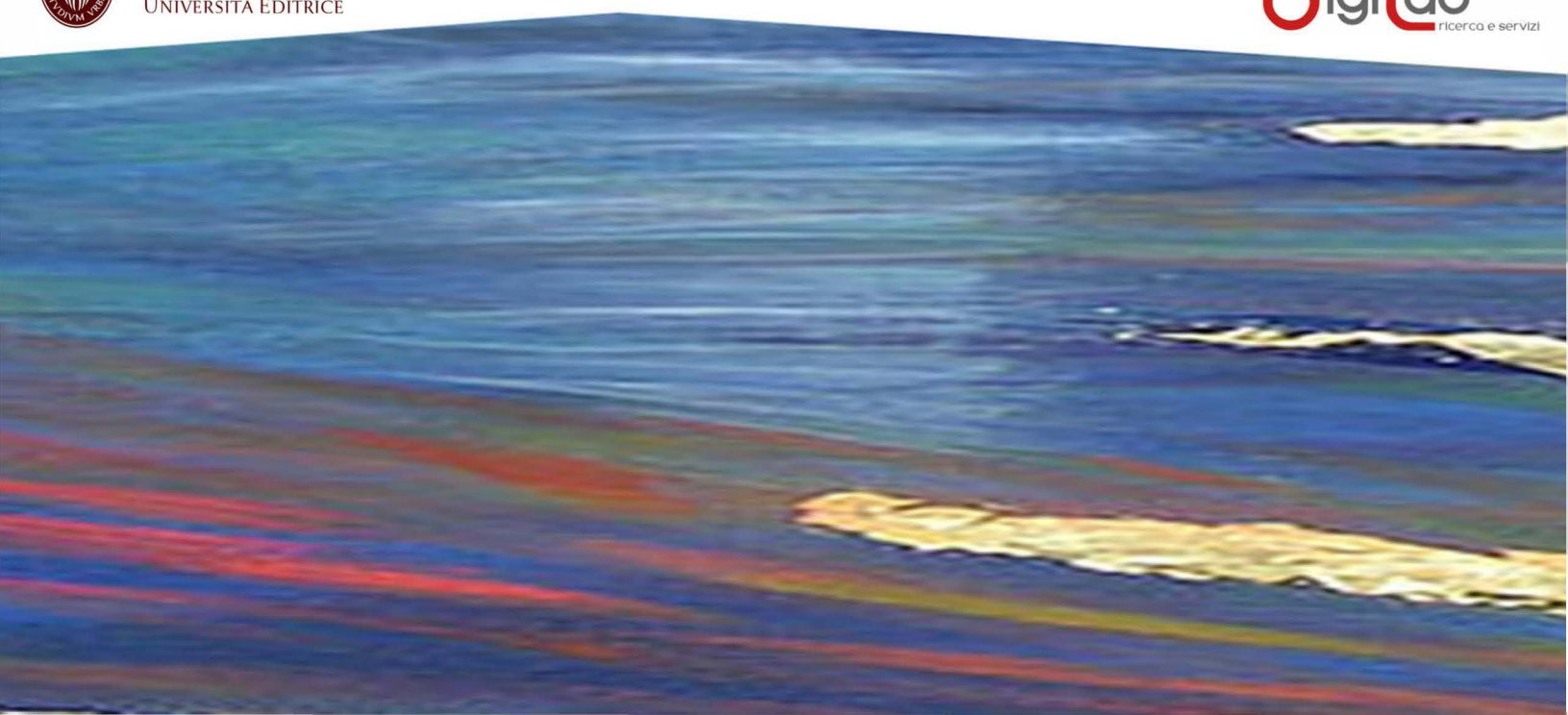

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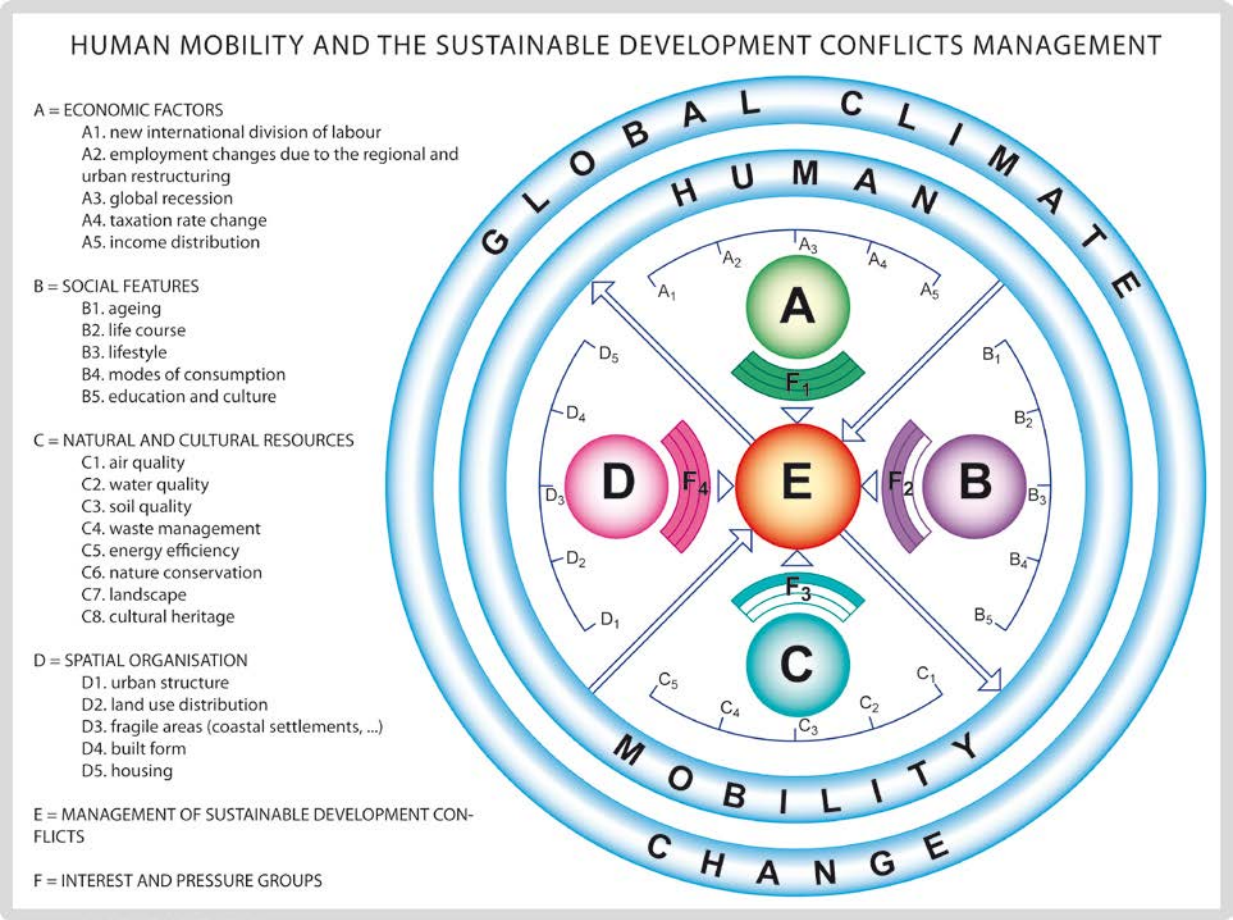
Editor's Preface to the Series

This volume is part of a series of publications on cross-national comparative research in the fields of global climate change, coastal areas, sustainable urban development and human mobility. These factors, are confronted with conflicts of interest which arise at both the local and the global level. The volumes being published in this series attempt to provide a contribution to resolving these conflicts. This multi-national and multi-disciplinary network was set up in 2009 on the occasion of the European Commission's call for proposals for a Seventh Framework Programme (FP7) project. The research project Solutions for Environmental Contrasts in Coastal Areas (SECOA), Global Change, Human Mobility and Sustainable Urban Development won the bid and began to work in December 2009 (http://www.projectsecoa.eu/), coordinated by Sapienza Innovazione (Riccardo Carelli), with scientific coordination by Sapienza Rome University (Armando Montanari). Global changes affect both the environment and socio-economic conditions: first the economic crisis of the 1970's and then the financial crisis of the first decade of the new millennium have had a profound impact on environmental and socio-economic conditions. SECOA examines the effects of human mobility on the growth and restructuring of urban settlements in coastal areas, where: a) the environment is particularly fragile and space is limited; b) every phenomenon is far more concentrated and; c) the effects on natural and cultural resources are more acute. Being aware of these effects can be extremely useful for governments and companies – particularly in the building sector, but also in tourism – with respect to plan future growth. Awareness of the environmental status of the coast and the local population's use preferences can help and support with regard to the planning of residential, retail and leisure facilities. Problems have multiplied as a result of climate change and its influence on environmental parameters such as the sea level, sparking an increased risk of flooding, the spread of pollution and the displacement of a large number of inhabitants. The control and reduction of undesirable consequences is leading to increased conflict among stakeholders. An integrated approach to the coastal ecosystem incorporating social, economic and natural sciences is essential to understand the complex and dynamic problems typical of these areas, as the Figure 0.1. illustrates. The problem's complexity and the heterogeneousness of the data required to document very diverse phenomena which are being managed using Geographic

Information Systems (GIS). SECOA aims to: 1) identify conflicts; 2) analyse their quantitative and qualitative effects on the environment; 3) create models to synthesise the various social, economic and environmental systems and; 4) compare the priorities of each type of coastal area using a taxonomic tool. Coastal areas have traditionally been considered difficult to manage due to problems such as the weather conditions, the tides' regimes and the atmospheric seasons and the overlapping of the specificities features of physical geography and hydrography, as well as overlapping jurisdictions and remits of individual government bodies and the competing needs of various civil society stakeholders. Local, regional and national administrations are often responsible for similar aspects of the same physical area, specially regarding coastal areas. Examples of that are fisheries, environment, agriculture, transport (inland and marine), urban planning, the land registry and cartographic and hydrographic services.

Many people are able to intuitively recognise a coastline, although they find it harder to determine its precise landward or seaward extent and vertical growth. For this reason, and considering the diversity of the stakeholders, managing authorities and administrative structures, there are inevitable conflicts between users of coastal zones, developers and the rest of society. Similarly, many times there is a conflict between human society and natural resources. Because of the complexity of the problems involved, the spatial component of data has also been taken into account through the use of GIS, which offer enhanced possibilities of contributing to coastal zone management for a number of reasons: (i) their its ability to manage large databanks and integrate data relating to quite heterogeneous criteria; (ii) their its inherent tendency to harmonise data from different sources and thereby contribute to the exchange of information between governing bodies and research institutes; (iii) the possibility it offers of using shared data banks; (iv) its inherent aptitude for modelling and simulation that allows for alternative scenarios to be built before being implemented. With the main goal of developing information that can appropriately inform decision-makers, online geographical maps are produced to illustrate the location of problems, the densification and concentration of shortcomings, the density, the content, what happens in the environs, and changes.

Figure 0.1. The SECOA Project (local-global-local).



Along with the problems created by climate change, the SECOA project examines the spread of human mobility – a research subject that principally involves the social science disciplines, each with its own research framework, levels of analysis, dominant theories and hypotheses of application. The social science fields can be considered according to the dependent and independent variables they use. For example, anthropology, demography and sociology consider behaviour a dependent variable; for economics, it is microeconomic flows and impacts; for geography, it is decision-making ability; for history, it is experience; for law, it is treatment and for political science, the dependent variables are management policies and their results. Examples are always hard to agree on, but in this case they are being used to emphasise the differences that exist even between related sectors, and the obvious multiplication of variables when the ones proposed by the social sciences must include geomorphological variables (the way the coast physically changes) and environmental and cultural resources (their availability and the way they are consumed). The SECOA project has attempted to tackle this problem by also

measuring types of individual mobility and the attractiveness of the territory. For previously mentioned reasons, these data are not generally registered, so it was decided to use the GIS tool, in order to add space and time values. Space in coastal metropolitan areas is characterised by the differences among the various spatial components, and it is not always easy to identify the coastal stretch used as the element of comparison. Time, on the other hand, is defined in terms of recurring daily, temporary and permanent mobility, with a further variant of mobility that is either production-led (blue-collar, white-collar, managers, regular and irregular workers) or consumption-led (including mobility for reasons of tourism, leisure and retirement). The prediction models, on the other hand, are an instrument to connect the past to the future, and hence to integrate the natural and cultural heritage and contribute to building prediction scenarios. The Series Editor wishes to thank the members of SECOA WP9 (of which this volume is an outcome), for their participation in the project and contributions to this volume. The Editorial Board, which played a key role, also took on the task of selecting and supervising the work of the referees – their collaboration has been invaluable in ensuring this volume is of good quality.

This volume also expresses necessary gratitude to and affectionate concern for all the stakeholders who have contributed with enthusiasm and efficiency to the work of the SECOA project. The Series Editor has decided to personally promote this seventh volume so as to emphasise a subject to which he has devoted the bulk of his career, starting with his involvement in CURB, a European research project, and later his role as member of the board of governors of the Italian NGO Italia Nostra and subsequently of the European Environment Bureau (EEB) in the 1970s; by contributing to the creation of European Partners for the Environment (EPE), and by participating in the work of the European Commission's Consultative Forum on the Environment and Sustainable Development, of which he was vice-president for a time. Finally, the Series editor would like to offer warm thanks to Riccardo Carelli, Braccioni and Marlène Sciarretta, Sapienza Innovazione, who set to work very competently, and with the great patience a comparative analysis project requires, to provide us with the science dissemination assistance.

Armando Montanari

Rome, November 2013

CHAPTER 0.
Introduction

Armando MONTANARI,
Department of European, American and Intercultural Studies,
Sapienza University of Rome, Italy

1. Introduction

Science dissemination is one of the institutional obligations of all researchers, particularly those whose work is supported by public funding. Validation for this assertion can be found in the basic instruments of the European Union, in the principles of partnership and, in its most advanced forms, in techniques of governance. If the process of science dissemination is not carried out correctly from the beginning, there is always a risk that the information may be manipulated, and public opinion with it; and this has happened so often that in many cases, and in many fields, researchers are no longer accorded the dignity of being seen as credible partners. It may indeed be true, as some believe, that there are disciplines in which the economic interests of the manufacturing sector are of such magnitude that knowledge is used, sometimes even manipulated with the collaboration of scientists themselves, in such a way that it is perceived in one way rather than another. On the other hand, civil society expects to be given information that is clear and complete, and for cultural mediators to interpret scientific results correctly; people want to know the real extent of any risks that applying scientific results might mean for their own existence and health and that of future generations.

In order to enhance its exploitation activities from the beginning, SECOA set up an End Users Panel; this was composed of local representatives from the SECOA case studies and national/regional institutions representing the countries involved. The End Users Panel is divided into the following major categories:

Table 0.1. SECOA, end users panel. Source: SECOA D 9.4 and D 9.5.

End Users Panel	**Typology**		
	National Authorities	**Regional and Local Authorities**	**NGOs**
Italy			
ISPRA – Istituto Superiore per la Protezione e Ricerca Ambientale	x		
Municipality of Civitavecchia		x	
Municipality of Pescara		x	
Municipality of Rome – District XIII		x	
Command Centre of the Port Authorities	x		

Belgium			
Municipality of Oostende		x	
Municipality of Brugge		x	
Flemish Government Coastal Division		x	
Ministry of the Flemish Region - Department Town and Country Planning		x	
AfdelingKust – Flemish Government		x	
United Kingdom			
Hampshire & Isle of Wight Wildlife Trust			x
Environment Agency	x		
Portsmouth City Council		x	
National Voice for Coastal Communities			x
Israel			
Ministry of Environmental Protection, Marine and Coastal Environment Division	x		
EcoOcean			x
Sweden			
Älvstranden Utveckling		x	
Kungälv municipality		x	
Vellinge Municipality		x	
Gothenburg Municipality – Department of Urban Development		x	
Gothenburg Region (County Administrative Borad Vastra Gotaland) – Water District Authority		x	
Malmö Municipality – Department of Urban Development		x	
Malmo Region (County Administrative Board Skane) – Department of Urban Development		x	
India			
Institute of Environmental Medicine			x
Mumbai Metropolitan Region Development Authority		x	
Chennai Metropolitan Region Development Authority		x	

Vietnam			
City People Committee of Hai Phong		x	
City People Committee of Nha Trang		x	
Vietnam Administration for Seas and Islands (VASI)	x		
Portugal			
Directorate General for Maritime Policy	x		
Regional Development and Coordinating Commissiono f the Algarve (CCDR Algarve)		x	
Municipality of Albufeira		x	
Municipality of Funchal		x	
Municipality of Almada		x	

The End Users listed below had regular contacts with SECOA representatives, but the level of interaction was less intense than with the End Users Panel members.

Table 0.2. SECOA, other end users. Source SECOA D 9.4 and D 9.5.

Other End Users	**Typology**		
	National Authorities	**Regional and Local Authorities**	**NGOs**
Italy			
Province of Chieti		x	
Sister srl (SME)			
Associazione per le Attività e le Ricerche Marine (MAR)			x
Belgium			
Belgian Federal Public Service of Health, Food Chain Safety and Environment	x		
Belgian Federal Council for Sustainable Development	x		
Flemish Community Department of Environment, Nature and Energy – Nature, Landscape and Energy		x	
Flemish Environmental Agency		x	
Flanders Marine Institute		x	
VITO - Flemish Technological Research Institute		x	
ICZM Coordination Point		x	
Oikos			x
Ruimte Vlaanderen – Flemish Government		x	

United Kingdom			
Commission for Architecture and the Built Environment	x		
Joint Regional Development Agencies Thames Gateway Program		x	
London Thames Gateway Development Corporation		x	
British Urban Regeneration Association (BURA)		x	
Department for Communities and Local Government		x	
Israel			
Society for the Protection of Nature			x
Sweden			
Swedish Agency for Nature Protection	x		
Swedish Board of Fisheries	x		
Swedish Association for Nature Protection			x
WWF Sweden			x
India			
Briahan Mumbai Municipal Corporation		x	
Vietnam			
Hai Phong Department of Science and Technology		x	
Hai Phong Department of Natural Resources and Environment		x	
Hai Phong Department of Agriculture and Rural Development		x	
Nha Trang Maritime Administration		x	
Portugal			
APL – Lisbon Port Authority		x	
LREC – Laboratório Regional de Engenharia Civil		x	

The SECOA Project considered a range of topics that are of direct interest to public opinion such as environmental conflicts and development scenarios for coastal urban settlements. Whilst all of these affect urban expansion and the control of climatic and socio-economic phenomena at the local level, their inherent nature means that they also have a global dimension. Local public opinion may be well aware of the consequences of such problems, but may find it less easy to understand its causes with any degree of clarity, and may hear remedies being discussed as the result of some catastrophe. Particularly in coastal areas, environmental conflicts are said to come about due to emergency situations: small and great catastrophes that somehow

seem to happen all the time. Often after each new catastrophe the local authorities, backed up by the so-called organs of "information", say that it was an extraordinary situation whose consequences could not have been foreseen. On 19 November 2013, for example, the New York Times reported that on the Mediterranean island of Sardinia "the streets and fields were flooded, homes and cars were submerged, and at least 16 people were killed after 17 inches of rain — half a year's worth — pummelled the island over a 24-hour period". The photograph that accompanied this report showed a road just outside the exit from a road tunnel, from which a torrent of water was pouring. But from this it was clear that the "catastrophe" had not come about as the result of some extraordinary event, but was the natural outcome of intense rainfall which was not only foreseeable but had in fact been predicted and had simply exacerbated a situation brought about by badly designed and implemented infrastructure and earthmoving works, leading to a crisis. The account given by the Italian media, which was seized upon by administrators and politicians, was that this out-of-the ordinary situation was the precursor of still more equally unimaginable, unforeseeable events and consequences to come. Therefore this deliberately misleading information attributed responsibility for the catastrophe to some "superhuman" force akin to the biblical Great Flood.

The environmental conflicts examined by the SECOA Project were related to rises in sea level and the direct effect of seawater flooding of coastal plains, as well on the flooding of inland watercourses and the normal reflux of inland water into the sea. Severe flooding always affects intensely populated coastal areas, destroys infrastructure and homes, and causes people to be killed, missing, or injured. For those who took part in SECOA, science dissemination is not only an instrument for communicating the results of research to stakeholders; the process of dissemination was a fundamentally important research tool for SECOA itself, since some of the work was based on consultations with SECOA's own stakeholders, collecting their assessments and their interpretations of the phenomena being studied, as well as the history of their local environmental conflicts and the reasons for those conflicts.

However this book cannot be, nor is intended to be an account of SECOA's activities in the area of science dissemination; it is simply to report on the issues addressed and the solutions sought. Our work took place as part of a discussion which has continued to expand during recent years and has brought in all sectors of public opinion along with administrators, private firms, and the media. The success of SECOA in the field of science dissemination is demonstrated by the numerous publications that were generated and the conferences at which SECOA researchers have assessed the possible outcomes of SECOA, which may continue to have their effects in future years.

It is not easy to fully introduce the principles of science dissemination into some sectors of society and indeed the initial difficulties are presented by the research sector itself, in which science dissemination is often seen as an inappropriate way of furthering the career of any young researcher. Other difficulties present themselves when dealing with public administrations, since politics have to be concerned with time-frames that are not the same as those of research. Research seeks solutions for medium to long-term issues, whilst politics has to focus on immediate action, not only to deal with contingent problems but because new elections come around every 4-5 years.

Therefore, politicians may not always have the preparation, or the interest, to grapple with the problems that scientific research puts before them and that often require difficult decisions to be taken. The media, too, are often constrained by the same time constrains as those that affect politics. All of which leaves civil society feeling the effects of this general unpreparedness, even though public opinion still allows itself to become involved in discussing issues about which it is not being given sufficient or correct information. Although in this regard, and as the results of SECOA have documented, there are significant differences between the less economically developed countries and those that are more developed, this is a large vicious circle that concerns all, and from which it is not easy to escape.

Although science dissemination is a civic duty for the researcher, any individual research project will only last for a short time, and cannot bring about the necessary change. A great deal was achieved by SECOA, but much more would have been needed. One sector where SECOA did achieve significant results was its work with schools at all levels, in coastal areas where children and young people have lived through environmental emergencies. Supported by able teachers, these youngsters showed a particular interest in learning more about these problems: verifying, discussing, and transforming their passion into teaching tools. Since these tools were based on a current first-level educational programme and directed to reflections that made it possible for the children to better interpret the world in which they live, they can be used as secondary sources. The personal experiences of the author at elementary schools (5-10 years old), middle schools (11-13 years old) and high schools (14-18 years old) in the coastal settlements in the metropolitan area of Rome, produced outstanding results and could lead to more successes in future. Inasmuch as they contribute to the knowledge of those who are destined to become the civil society of future generations.

In the coastal areas of all the countries where SECOA has operated there have been important experiences of awareness and knowledge rising that were helped by families and teachers working with non-governmental organizations (NGOs). So far as the metropolitan area of Rome is concerned, this educational experience with the youngsters, carried out in the schools,

made use of SECOA illustrative material along with the results of events organised by NGOs. We, researchers of SECOA were invited to take part in discussions with the children and answer their questions; although this may appear to have been only a secondary function, it forced us to operate on the same level as these young people, follow their ways of thinking, and use their words, and this enabled us to better understand the meaning of our own work. Perhaps this is where we should now begin again, to understand how knowledge *dissemination* can also become knowledge *advantage* for those of us who are involved in research.

However, it is difficult to give a quantitative assessment of this knowledge advantage, and a qualitative assessment will only be possible over a longer term, but now we can provide some data for the periodof June-November 2013 and for the previous period November 2009-May 2013:

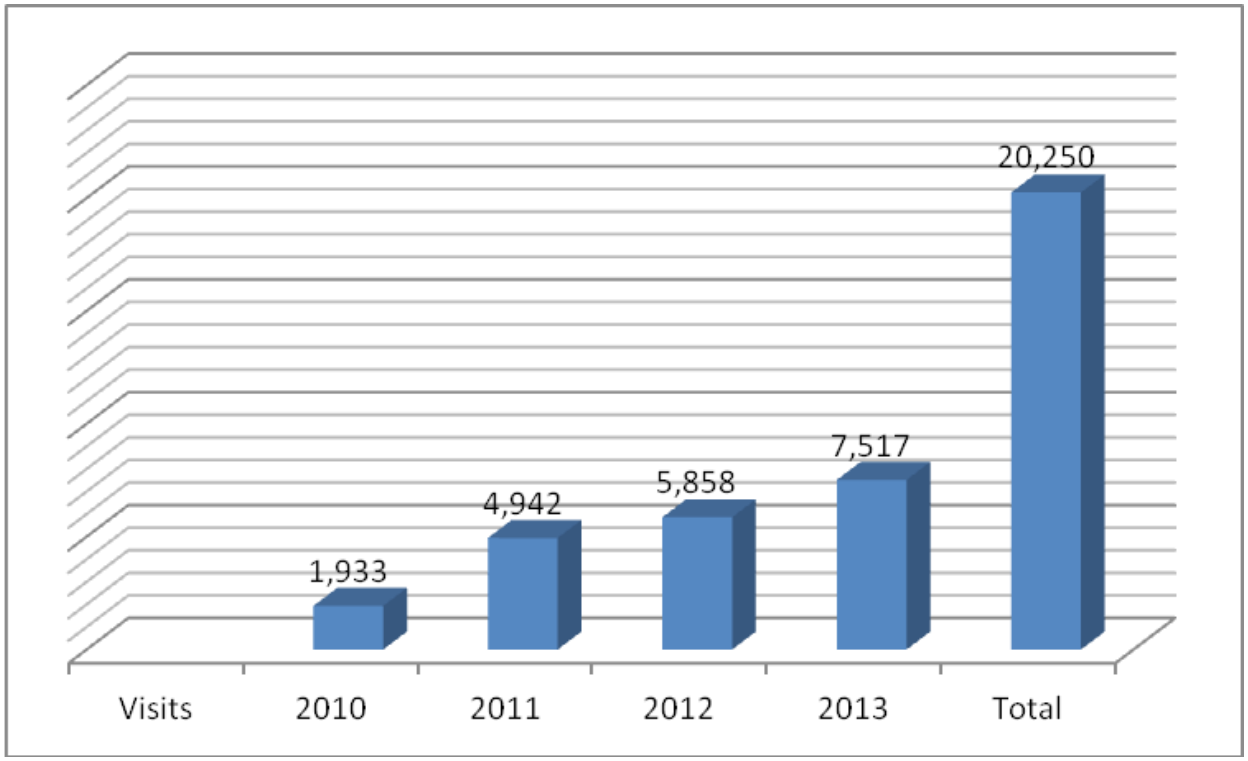
- 6 volumes have been published by Sapienza University Press in the open access series and 3 more are in preparation, making a total of 9;
- 6 contributions have been published in scientific journals or conference proceedings with 3 more pending, totalling 34;
- 2 articles in daily newspapers/magazines/websites (19 in total);
- 13 presentations at conferences/workshops (64 in total); 2 public events organised (4 in total);
- 2 posters presented (15 in total);
- 2 PhD theses on SECOA (5 in total);
- 2 participations in exhibitions during the course of the project (in the previous period);
- 1 interview (9 in total);
- 1 video (5 in total);
- Italy: 1 meeting (30 in total);
- Belgium: none (11 in total); United Kingdom: 1 meeting (28 in total);
- Portugal: 5 meetings (13 in total);
- India: none (14 in total);
- Vietnam: none (5 in total).

Additionally, as shown in Table 1, since the SECOA website was first set up in March 2010 it has had about 20,000 visits from 106 countries:

Table 0.3. SECOA Web Site visits (2010 – 2013).

Period 1.03.2010 - 30.11.2013						
	Country	**Visits**	**% New Visits**	**New Visits**	**Bounce Rate**	**Pages/ Visit**
		20,250	65.5%	13,272	62.5%	3.55
1	Italy	4,029	41.9%	1.689	44.9%	5.47
2	India	3,451	83.7%	2.890	78.2%	2.24
3	Portugal	2,438	62.8%	1.531	50.6%	4.35
4	UK	1,959	55.9%	1.096	57.8%	3.81
5	Belgium	1,195	40.3%	482	64.8%	3.64
6	USA	1,147	92.1%	1.057	85.8%	1.35
7	Sweden	790	40.1%	317	46.5%	5.37
8	Israel	566	52.5%	297	42.9%	5.51
9	(Not set)	444	92.3%	410	86.0%	1.29
10	Vietnam	427	44.0%	188	43.1%	5.86

Figure 0.1. SECOA Web Site visits (2010 – 2013).



Part One of this volume deals with the knowledge and topics addressed by those involved in knowledge dissemination, and considers the changes that have taken place during the past few decades, thanks to the introduction of ICT tools, which have also influenced the ability and readiness of public opinion to intervene in matters that are pre-eminently scientific. It presents insights that were developed in relation to the activity of the Food and Agriculture Organization of the United Nations (FAO), which operates globally, and the activities of the Association for Marine Activities and Research (MAR), an NGO that operates mainly at the local level.

Part Two considers the potential of the new technologies and the limits they can impose on scientific dissemination. Since photography was not covered by SECOA, the work made use of material from PLACE, a previous European project. Within SECOA our work on scientific dissemination made use of social media and the Internet.

Parts Three and Four focus on how scientific dissemination was tested and evaluated by the SECOA's stakeholders, who in this case were also the end users. Part Three recounts the experience of working with a middle school in Civitavecchia and a high school in Ostia. Both of these towns are on the coast of the metropolitan area of Rome and were selected by SECOA due to local environmental conflicts. In the case ofCivitavecchia, the conflicts derive from air pollution caused by a large power station and an intense traffic of commercial and cruise shipping. At Ostia the environmental problems are caused by sea level rise, coastal erosion, and flood risks. At Civitavecchia, a tutor working with a middle school class produced a kind of Snakes and Ladders game for which the students made drawings, taking their inspiration from themes concerning the sea and the coast. In the high school in Ostia the students were older, and had more highly developed practical abilities. Thus, they made a video in English, in which they explained their point of view on the environmental issues in their local region and about how they interpreted the programme of dissemination proposed by SECOA. For all these collaborations with schools, SECOA prepared a series of posters and videos explaining the essential elements of the project; all of this material is available at the SECOA website. The material produced by the schoolchildren was presented and discussed at the BIG BLU 2012 and BIG BLU 2013, events organised by the non-governmental organisation MAR. At the end, some of the SECOA researchers, were invited to take part in meetings at the schools, in order to answer questions from the students.

Part Four of this book deals with the activities of SECOA's end users and the outcomes of a meeting held in India as part of a SECOA session. It brings together their perceptions of the SECOA dissemination programme, and their opinions on what could be done to improve the

effectiveness of the collaboration between the partners. Our choice of end users tried to ensure that most of the stakeholder types would be included, but since it was not possible for all stakeholders of all countries to be represented, it was decided to have at least all the types represented, even though they were from different countries.

The end users of SECOA are those who have had formal recognition from the SECOA Project and the European Commission, and as such were invited to attend the scheduled SECOA meetings. Along with this international dimension, at the local level the researchers collaborated with all the stakeholder types and involved them in national or local meetings. The book brings together the testimony of those who were able to prepare contributions of their own, when all end users of SECOA were invited to do so. However should take into account that these stakeholders were extensively engaged in their own work, with deadlines that toke priority over those of the SECOA research project. Furthermore their activity is mainly deployed at the local level; the global dimension, such as that of SECOA, is understood but has not always succeeded in becoming a top priority for them.

PART 1. SCIENCE DISSEMINATION

CHAPTER 1.

Researcher and Stakeholder Cooperation in Scientific Dissemination: Fostering Innovative Challenges, Between Static and Dynamic Dissemination

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1. Introduction

The word "dissemination" derives from the verb *to disseminate* which, according to the Oxford Dictionary, means "to distribute or spread widely ideas, doctrines, etc.". Its equivalent in Italian is *divulgazione*; in French *diffusion*; in Spanish *diseminación*; in Portuguese *disseminação* and; in German *Verbreitung*. Most of these translations make reference to the Latin *disseminãre* in its meaning of spreading the seed on all sides, or to the Latin *divulgãre* in its meaning of "spreading through the crowd". These etymological references help us to go back over the evolution of the term. It now finds itself having to take on ever more sophisticated meanings whilst still struggling to lose its former values, which are limited to a process that relates an individual as "subject" who disseminates to another individual as "object" who receives that which is disseminated.

The concept of dissemination is not new to science, but there is no question that ICT has changed its terms, which are not technological as may have been thought, but are exclusively concerned with the political dimension. Technological tools may have made it possible to reduce distances, but now it is time for other tools, of culture and politics, to do likewise. That is why, in this publication, the word "dissemination" is not considered as only a technical phenomenon but above all as a component of a process giving access to information, activated first through partnership and then through governance. Where environmental issues are concerned, initially both concepts were applied because of a need to ensure the whole of society of its right to a healthy, uncontaminated environment. For that reason there was a need to identify a democratic right to information about the environment. In terms of policy, the need to integrate environmental concerns into all sectoral policies has been recognised; when Europe recognised the need to innovate by diffusing the results of research, particularly in the case of research supported by public funding, it was also reiterating a basic right.

The concept of *dissemination*, as it is understood today, evolved from the concept of *partnership,* which went on to become *governance*. But research has, intentionally, not always been considered as something that can be explicitly subjected to partnership. Although it should not be forgotten that there do exist EU research programmes which finance systems, methods, and topics that are defined *a priori* as part of the responsibilities of the European Council, the European Commission, and the European Parliament. Whilst that may be an inherently democratic arrangement, it could certainly be improved by introducing the idea of greater shared responsibilities and cutting back the role of the Directorates General, which currently have

absolute decision-making power in determining the geographic locations, time-frames, roles, and methods of research.

For some time the idea of partnership has already been applied to other areas of responsibility of the Commission, for example the environment, where it was fundamentally important to try to introduce partnership into sectors that traditionally came within the competence of the European Union. For that reason, more far-reaching integration should be attempted in all sectors of EU operation – including research, which has its own transversal validity – and including the greatest possible numbers of stakeholders. By these means the word "dissemination" would become understood not as a limited top-down process, but as a process verified by society itself, as the ultimate recipient of the disseminated outcomes from research.

2. Partnership as a basic principle of science dissemination

Science dissemination cannot be considered as an act of cognitive generosity, but should be understood more comprehensively to mean partnership. For that reason it has to be a collaboration that goes from identifying the research sectors to which priority financing should be awarded, to how that research should be conducted, and finally for making the outcomes available to civil society and the other stakeholders. This is especially the case when the knowledge to be disseminated concerns the outcomes of scientific research on environmental issues.

Ever since the 1992 Rio Earth Summit the word *partnership*, which until then was taken in its dictionary meaning of *association* and *society*, has acquired new significance and is now understood as one of the instruments that must be used to enable sustainable development to be achieved. But its meaning is sometimes still abused and even now is thought to be "ambiguous" in that its practical application refers to methods and experiences that are very different and even contradictory. So far as the European Union is concerned the idea of shared responsibilities, consultation, and partnership derive their cultural and regulatory reference from Article 2 of the Maastricht Treaty (1992) where the promotion of sustainable growth that respects the environment was set out as a priority objective of the EU and the Member States. Article 174 of the Treaty of Amsterdam (1999) further states that Community environmental policies should pursue the objectives of preserving, safeguarding, and improving the quality of the environment, protecting human health, using natural resources prudently and rationally, and promoting international measures to deal with regional or worldwide environmental problems. Science

must therefore also make its contribution to sustainable development via the instrument of partnership.

In the agreements signed by the national governments at the United Nations Conference on Environment and Development (UNCED) at Rio de Janeiro in June 1992, one of the first applications of those principles was entitled "*Towards sustainability: A European Community programme of policy and action in relation to the environment and sustainable development*" (the Fifth Environmental Action Programme or 5th EAP), which was approved by the European Council in February 1993. The 5th EAP indicated some instruments which, from then onwards, were intended to facilitate the attainment of two objectives: (1) the integration of environmental considerations into the formulation and implementation of economic and sectoral policies, into the decisions of public authorities, into the design and development of manufacturing processes, and finally into the behaviour and decisions of the individual citizen; (2) dialogue and concerted action involving the various partners (public administrations, public and private companies, and the public, represented by the NGOs dealing with the environment, by consumers, trade unions, and by trade associations): a dialogue that would only be fruitful if it was able to refer to objective, reliable information about the state of the environment, based on better data than what had been available until then.

Therefore partnership provides tools for overcoming the weaknesses of a fragmented, overly competitive, conflictual form of short-term management that is not able to take the longer view, although to be successful, it must

a) correctly identify the actors needed for the success of the initiative;
b) assist the partners to recognise their own strengths and weaknesses, identifying the opportunities open to them, and the objectives they set for themselves;
c) make the most of the differing resources and strengths of the partners;
d) provide an institutional meeting point as a forum where priorities can be defined;
e) provide a mechanism that makes it possible to identify the critical points for attaining the objectives;
f) integrate differing points of view to reduce the risks of conflict between the potential partners.

Nevertheless there is no absolutely fail-safe formula that could ensure the success of a partnership process, which will vary in relation to local characteristics and changes in how partnership processes are perceived at the global level, and may also vary in relation to the main scenarios to which it refers.

The Consultative Forum on the Environment, set up by the European Commission in 1997, set out the following scenarios for attaining the goal of a sustainable Europe: (a) a partnership model that is voluntary, pragmatic, orientated towards carrying out specific interventions, and aims to promote new ideas and helps to implement new solutions (the *Opening Opportunities* scenario); (b) a partnership model whose processes are managed and optimised from the top-down: partnership that aims to improve the quality, timeliness, efficiency, and effectiveness of the decision-making processes (the *Managing the Transition* scenario); (c) a partnership model that identifies risks and preoccupations in advance, takes the necessary precautions, and helps to rebalance the equity deficit (the *Transforming Communities* scenario). As examples of these top-down or bottom-up processes two European partnership experiences can be adduced: the European Consultative Forum on the Environment and Sustainable Development (ECFESD) (top-down), and European Partners for the Environment (EPE) (bottom-up).

At the request of the European Commission the EU set up ECFESD (the top-down version of partnership) in 1993 along with other innovative instruments designed to encourage concrete implementation of the principles set out in the Fifth Environmental Action Programme (the 5th EAP), and as a forum for consultation and information exchange between the manufacturing sector, the business world, regional and local authorities, trade associations, trade unions, environmental and consumer protection organisations, and the Directorates General of the European Commission. The task of identifying the most suitable instruments and methods for moving towards the common goal of sustainability, and for reaching a high degree of awareness and consensus for the application of the principle of shared responsibilities, was assigned to ECFESD, which from 1994-96 and then for four more years 1997-2001, issued guidance on environmental and sustainable development issues.

Whilst it is likely that establishing such meeting places at the European and national level, in which the research world could play a part, would have helped to refine the instruments of science dissemination, the ECFESD operated under the aegis of the European Commissioner for the Environment; this is a questionable type of arrangement that is not impartial and has at least the appearance of having an excessively pro-environmental bias, which means that it is not always able to provide the guarantees necessary for correct integration and may thus find it difficult to act effectively. What is more an environmentally-biased administrative body of that kind which, for purely political reasons, may have to commit too strongly to seek a balanced position, may in the end lose sight of its own founding aims and interests.

Moreove, EPE exemplifies the alternative bottom-up version of partnership. EPE is a not-for-profit private association established at the initiative of the European Environmental Bureau (EEB) and of a number of large private companies, which were later combined with public authorities, environmental organisations, private companies, trade unions, and professional and consumer protection bodies: exactly the types of actors called upon by the EU to be part of these processes. The EPE was set up not only to facilitate social dialogue on questions of principle or methodological approach, but also to achieve concrete results; the expectation is that in a setting of this type, which balances the needs expressed by the economy, society, and the environment in various places at various times, the outcome should be a change of attitude to the possibilities of a sustainable form of development. The EPE sees this change as interaction: a frank exchange of views and constructive confrontation between positions that do not always converge.

In general, the partners in EPE are intensely rooted in the economic and social fabric and their efforts are thus focussed on anticipating the aspirations of society. Companies are keen to learn more about consumers so that they can keep track of their tastes in a timely way and if possible, anticipate trends. In the same way, governments and administrations (for example) keep track of their electors, or environmental associations and trade unions keep themselves attuned to the expectations of their members. In EPE, all these actors agreed to come together and construct a concrete, ongoing point of reference in which each can construct its own wider network of knowledge and relationships and compare itself with other social and economic entities whose experiences, attitudes, and perspectives may differ widely from their own and may frequently even be alternative to them or in conflict with them. To put this all more briefly, EPE could be described as a reciprocal learning instrument whose focus is sustainability.

The point of reference that originally led to the setting up of ECFESD and the EPE was in the United States, where the former President Clinton established the President's Council on Sustainable Development (PCSD) in 1993. The PCSD was based on collaborative partnership between local authorities, private entrepreneurs, and citizens who since 1984 had already been working on the environmental and social recovery of the industrial area of Chattanooga on the Tennessee River, which at that time was one of the most degraded areas in the country. The PCSD Chattanooga project, which aimed to reach completion by the year 2000, identified the most suitable methodologies and technologies to reduce the production and storage of waste, toxic substances, and pesticides, to purify and protect the air, the water, and the land, and to identify new jobs and economic opportunities. It proved to be an environmental success story that reinstated the environment's quality and brought about a recovery of the economy, leading to

more widespread andequitably distributed social well-being, not because of some top-down development plan imposed from outside but, thanks to concerted bottom-up collaboration between various actors in the local community.

For some years a number of European countries have already begun attempting to protect the landscape using the instrument of shared responsibilities, which is seen as necessary to fully implement regulatory instruments which on their own are often ineffective, as well as financial and economic instruments which if applied without broad social control, can sometimes lead to abuses. The EPE has analysed the practical application of the principle of partnership in the sector of tourism, recreation and leisure, beginning from the assumptions that these sectors: i) are distributed in all regions and all countries; ii) specifically relate to environmental resources; iii) require a journey to take place in order to be consumed; iv) are particularly differentiated and fragmented and are therefore particularly difficult to manage and; v) generate spatial and temporal polarisation that increases pressure on the environment (Williams and Shaw, 1996).

In recent decades the social sciences have been devoting a great deal of attention to studying and analysing the local and regional consequences of the economic restructuring processes brought about by the passage from Fordist to post-Fordist forms of manufacturing (Amin, 1994). These studies have been supplemented by *regulationist* theory, according to which there is a correspondence between regimes of accumulation and the modes of regulation that are required to maintain the stability of social systems (Dunford, 1990). The fundamental problem has been to verify whether there is a logical nexus between the concept of sustainability and the need for regulation, in a context in which the use of landscape is becoming more fragmented and dispersed. Some scholars (Welford and Gouldson, 1993) claim that distributing manufacturing more widely, and keeping it at a smaller scale, is better for the environment because this gives local communities more control over it. Furthermore, local control presupposes that there will be less consumption of natural resources and that less pollution will be generated, than in large-scale situations where environmental, economic and social policy-making, as well as monitoring its implementation, are exercised from afar by administrations that have no local roots. Based on that assumption, it is possible to envisage the emergence of a new system of local economies that are locally controlled and have less of an impact on the environment (Gibbs, 1996). However since small firms and local systems of this type would be more likely to respond positively to the challenges of environmental management, they would need a greater degree of managerial autonomy so that they are directly accountable for their own actions, rather than being required

to operate in accordance with rigid regulations imposed from outside, which in any case may not be suitable for dealing with the problems at hand.

Consequently we find ourselves in a transitional phase as we move away from the direct, dominant involvement of central and local administrations, towards a much more complex system of territorial management, in which programmes are defined and prioritised on a case-by-case basis and run for a set time on a basis of partnership and collaboration between different local actors (Goodwin and Painter, 1996). The emergence of this new approach can be attributed to various factors:

a) a reduction of economic resources;

b) the need to avoid duplication in policy planning and management;

c) the benefits that can be derived from collaborating to seek external funding;

d) the synergies that are activated by combining knowledge, experience and enthusiasm;

e) the numerous contacts and collaborations that are activated;

f) the greater freedom and incentives for innovation that can form by operating outside the control of public agencies;

g) the possibility of establishing better contact with individual localities (Charlton, 1998).

These kinds of partnership find further legitimation in the concept of self-regulation, which makes individuals, firms, and administrations responsible for managing their own environment as a resource (Williams and Montanari, 1999).

Thus self-regulation becomes the antithesis of regulations imposed by public administrations (i.e. state regulation) and gets its impulse instead from a neo-liberalist approach, which assumes that individual decisions are more efficient at attaining predetermined objectives, including consumer satisfaction and protecting the environment, in that they maximise the positive effects of free decision-making by individuals who can operate without interference from public administrations; and this is said to make the market more effective at serving the interests of the individual (Hayek, 1988).

In Western countries, self-regulation finds further justification in the limits that state regulation has been encountering in recent decades, when rather than encouraging a positive attitude on the part of consumers and producers, has come to be associated with the imposition of negative, punitive controls and regulations. Both of these justifications can be successfully brought together to develop self-regulation policies that create the conditions for pressure and stimulus in forms of state intervention that are still possible, but hopefully are never needed.

3. Governance as an instrument for managing science dissemination

Governance is the outline of the different ways in which individuals and institutions, both public and private, manage their affairs: a continuous process in which different or even conflicting interests can be accommodated and initiatives can be jointly undertaken. The concept includes formal institutions and regimes to which full powers are granted to enforce compliance, but can also refer to informal agreements between individuals and institutions or potential agreements which they believe might be in their common interest (The Commission on Global Governance, 1995). Examples of governance at the local level could include neighbourhood work to organise and operate a service; a municipality that sets up a waste recycling system; an inter-municipal transport plan coordinated by the administrations and user groups; or a regional initiative taken by public administrations, industry groups, and residents' associations working together to control deforestation.

Translated into Italian the word *governance* might mean something along the lines of "*organising the decision-making process*" and its first meaning was in fact taken to be "*organised intergovernmental relations*". Today it is also assumed to include the activities of NGOs, citizen movements, multinational corporations, and even the global capital market; its former meaning as a partnership between governments has now extended to encompass other forms of shared responsibility. So far, concerning sustainable development, the word "governance" has become the metaphorical expression of a need for changed relationships between the actors involved in it.

The world's economy is undergoing profound transformation; as a result of the new information and communication technologies, the nature of work itself has changed, and will force nation-states to rethink the nature of their political systems. In coming decades the civil sector will be integrated into the traditional bipolar system of market plus government, replacing it with a tri-polar relationship in which each component will control and balance the other two: a new political paradigm that will then find itself compelled to reorganise the very idea of citizenship. And in fact, in May 1999 in his speech to the General Assembly of the European Parliament, the former EEB Secretary-General Raymond Van Ermen stated that the operational objective for Europe was to be "European Governance": a model of partnership for the 21st century that would be based on a three-way relationship between public authorities (infrastructure capital), the market (market capital), and civil society (social capital, i.e. social actors, associations, churches, humanitarian movements, consumer organisations, and institutions for education and lifelong learning). Each component of this triangle operates in accordance with its own time-frames which in the case of civil society could be anything from the short life-spans of NIMBY concerns to the thousand-year-old religions; in the case of the market

it could refer to the week-by-week deadlines of the financial markets, and in the case of public authorities, to the need for new elections every few years.

In Europe a new balance of power is coming about between these three main components; new prospects are deriving from the concept of European citizenship and from the rights associated with it. Even though so far the three components have not been accorded equal dignity and in some cases the idea of partnership between them has become confused with the idea of consensus-building, which may at times include forms of manipulation that further devalue it. Nevertheless partnership is necessary since there are, at least, two trust crises that must be overcome: (a) the lack of trust between society and the public authorities and; (b) the risk that business may lose the trust of the public if public opinion sees it as part of a system that does not respond positively to their demands and needs and is directed against them.

So far as the EU is concerned, to complete the institutional and procedural reforms that are expected by the new Commission and the new Parliament it is therefore necessary to define new forms of governance based on complete information, on dialogue with public opinion, and involving all the actors. Thus, rather than prescriptive measures, the basis for a culture of sustainable development in this new multilevel system of governance should be partnership, participation, and the involvement of civil society. As Italy is concerned, the instruments and methods of governance in relation to sustainable development, indicated in a document that the Consultative Forum on the Environment and Sustainable Development has submitted to the new European Commission, make reference to the need to reorganise such tried and tested social sectors as wage bargaining, the standardisation of products (via CEN and CENELEC) and of best professional practices, and the system of education and training (Commission of the European Communities, 1999).

Taking a similar approach, in recent years the government of the Netherlands has developed its own policy of cooperative environmental management, based on five elements: 1) making the whole of society responsible for the environment; 2) providing clear, comprehensible information that is acceptable to all; 3) recognising that the policy is only one element of a process in which many actors have a critical role to play; 4) configuring the political debate in terms that are acceptable to all its participants; 5) committing to the long-term continuity of the policy, of which there are numerous significant examples (de Jongh, 1999). This decision was motivated by the fact that a drastic policy shift is now required, since interventions so far have been confined only to the most badly degraded situations and there has been reluctance to address the root causes, since this would in turn require economic structures and manufacturing processes to be completely rethought.

Technology and economy are in fact continuing to expand much more quickly than the speed with which public administrations are able to draw up the necessary regulatory measures: an acceleration that is posing problems which can no longer be dealt with using the traditional instruments that regulate manufacturing processes, because those instruments can only intervene at the end. That being so, it is expectedthat a new, more advanced form of "science dissemination governance" can come into being.

Figure.1.1. SECOA phases of knowledge and information flows.

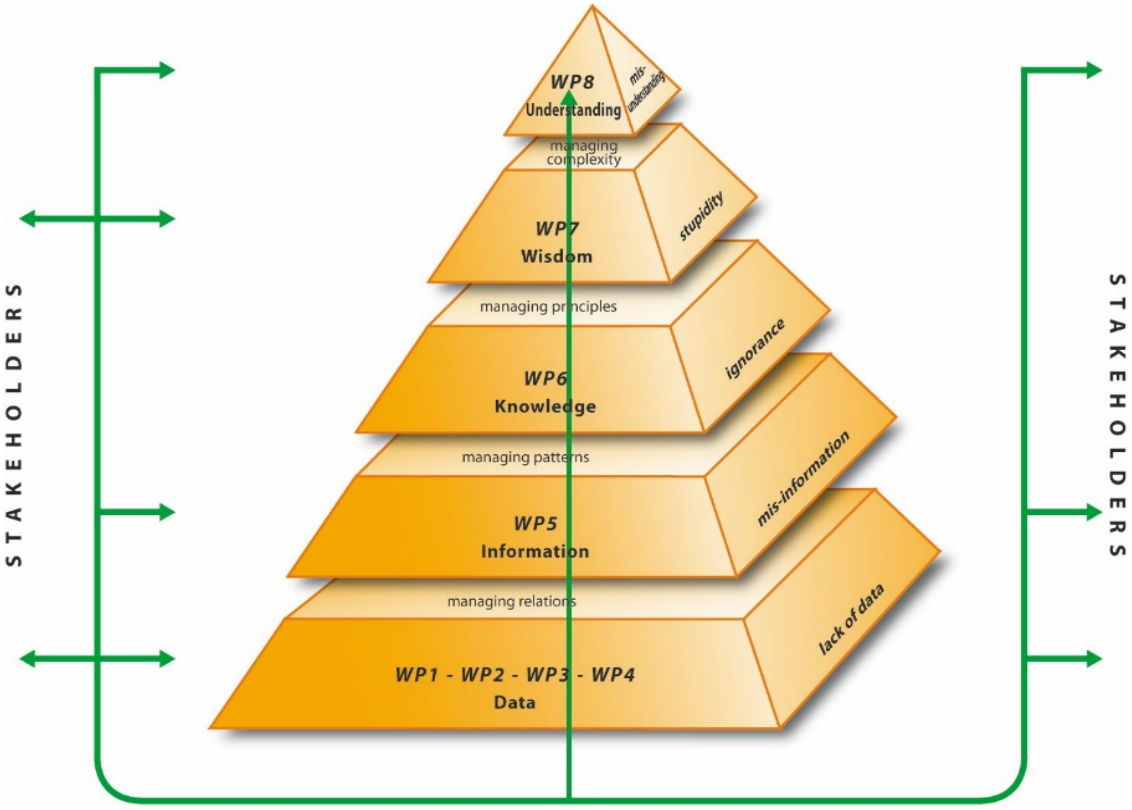


Fig. 1.1. shows the phases of knowledge as these were configured within SECOA, where an initial version of science dissemination governance became necessary so that the disciplines responsible for each level could communicate in the best way possible. For each of these levels a connection with stakeholders was established for collecting, selecting, and interpreting the data and identifying qualitative priorities. This first phase, which can be described as an early form of science dissemination governance, served to establish reciprocal trust and knowledge among the stakeholders in relation to the essential data to be collected. In the third phase of SECOA, the results of the scientific elaborations are made available to the stakeholders in a form that is already very familiar to them.

4. The relevance of science dissemination

Above and beyond the principles written into the constitution of the EU, science dissemination is much more important today than it may have been in the past. Partly because scientific progress is having a significant impact on society, and partly in relation to progress in the development of new information and communication tools. Whatever the reasons, if scientific information (which may or may not be genuinely "scientific") is not correctly managed, it can reach the general public in ways that may generate only uncertainty and panic, exacerbating the public's perception that scientific innovation is associated with risk.

Hence as Păcurar (2012) suggests, researchers ought to think more carefully about making the structure of their research and its outcomes more comprehensible so that the whole process can be understood; indeed, a distorted form of dissemination might be worse than no dissemination at all. Păcurar (2012) also suggests that if we want to ensure that all the components of a research process are more completely understood, we need to be aware of who is transmitting scientific knowledge to civil society today, and why it is now so important that public opinion should be correctly informed. For that reason many institutions have decided to promote the results of their scientific work as part of a wider process of mass communication.

However as demonstrated by the numerous publications which scattered technical and scientific information in the past, science dissemination is not exclusively a consequence of ICT, nor is it a topic that has only recently emerged. According to Lancaster (1977), "scientific and technical information is transmitted in two ways through formal and informal channels. The formal channels mainly involve the use of printed documents of various kinds, while the informal channels are more concerned with oral information transfer. Printed documents may be disseminated through 'invisible colleges' and similar manifestations of informal communication, while professional conferences combine formal presentations with the opportunity for informal communication. Both types of communication are important for scientific and technological progress". He drew a diagram, which depicted the technical and scientific disseminations that take place via primary and secondary sources as a continuous cycle. This cycle can be summarised as a series of steps: (i) the production and processing of ideas; (ii) codifying the outcomes, (iii) primary publication, (iv) refining and comparing the consequences of publication. This process is necessary to create the particularly complex product which is to be transmitted to society. Lancaster (1977) also tried to develop a hypothesis

by way of how the process might be transformed by computer technology, which already since the early 1960s had begun to be applied to the processes of dissemination. Depending on its ability to apply the new technology, he surmised that the dissemination process would remain the same but would accumulate more information and process it more quickly. But in the event, ICT significantly changed the process itself by reducing the distance between the producer of scientific results and the user, *de facto* abolishing most cultural intermediaries and filters.

Today and since some time ago, there has no longer been any difference between primary distribution and secondary publication; as soon as a text is published on the Internet it is immediately automatically catalogued, although printed documents can still be distributed through formal communication channels and formal presentations are still made at conferences, which continue to present opportunities for informal verbal communication. In terms of disseminating the results of research, for many years libraries used to play a very important role by cataloguing and indexing printed works and enabling them to be circulated, and the publishers of secondary services played an important role by publishing abstracts, indices, and synopses of the literature published in primary sources.

Lancaster (1977) also offered a glimpse of what he though was likely to come with the spread of ICT. We can understand how quickly that happened by considering the costs of access to publications. Between 1965 and 1975 in the U.S. a year's subscription to a typical scientific review increased by 250% but a researcher's salary did not increase by anything like the same amount, which put secondary sources beyond the means of the individual researcher. Lancaster (1977) predicted that something similar would soon happen in the case of primary sources as well. He was thinking about the situation as he knew it, attempting to construct future scenarios for the year 2000, when ICT tools became as widely used as the telephone was in his time in the 1970s.

5. Early examples of dissemination in the study of urban settlements: From the CURB project to the Turin project

While the concept of dissemination in practical terms referred to in this volume is relatively new, there have been forms of dissemination of the results of scientific research in previous decades. One such case is the CURB (Costs of Urban Growth) project, co-ordinated by the International Social Science Council (ISSC)'s European Coordination Centre for Research and Documentation in Social Sciences (Vienna Centre), from 1971–1982 (Montanari, 2012; 2013b). The results of the CURB project were transferred to the Turin project, which had been initiated and co-ordinated by local authorities with the participation of other stakeholders. The Turin project was formally approved at the United Nations Habitat Conference in Vancouver, in 1976. Subsequently, at the 7th Conference of Mayors of the World's Major Cities, organised by the Centre for Co-operation Among the Cities of the World and held in Turin and in Milan in 1978. Turin was asked to commission research into the problems of an industrial city. There were many factors pointing to the crisis that industrial cities were experiencing and the need to identify urban policies aimed at the economic regeneration of large cities. In fact, there was obvious signs of crisis: fewer industrial jobs, above-average unemployment levels in various countries, and a growing number of people employed by the service sector. For this reason, at the 1978 conference, the CURB project researchers were asked to transmit the results of their research, which had identified a turning point in the growth of metropolitan areas (Berg v.d., Drewett, Klaassen, Rossi, Vijverberg, 1982). A similar phenomenon had previously been noted in the U.S. by Berry (1976).

Vladimir-Braco Mušič, the CURB researchers' representative at the conference, made a speech in which he pointed out that the city is both a community of people and an opportunity for a learning experience. Therefore, social and economic relationships must be changed in order to efficiently change the city's structure. Civil society must be involved to the greatest possible extent in the process of change, and superficial utopias must be avoided. The former Mayor of Turin, Diego Novelli, criticised researchers and urban planners for being out of touch with society. Mušič replied that research on urban issues could not merely be considered a technical activity. It had to be seen first and foremost as a social sciences endeavour aimed at policy implementation. Therefore, the individual phases of a process comprising research, consultation, university teaching and political work had to be combined.

The conference gave Turin the task of initiating and managing the International Turin Project following a proposal by Mr Novelli to use the city as a living laboratory in which to study and acquire a clearer understanding of urban processes. Turin was a good base for in-depth study

because it had a wide range of problems, some of which had become particularly acute. A working group was set up by the Turin City Council, comprising technicians and city politicians as well as researchers from four faculties at the University of Turin, who worked on seven research themes together known as the Turin Project, with the sub-heading "The urban economy and its territorial and social aspects":

1. An analysis of the economic structure of metropolitan areas with a view to identifying the most important features and providing an explanatory model of the way in which the economy functions;
2. A study on population dynamics and structure including the demographic characteristics of the city;
3. An analysis of the labour market in a metropolitan area and trends in the demand and supply of labour;
4. Instruments for the management of spatial aspects of change in the urban economy at the local government level;
5. Tools for governing the local economy, a review of the practical experiences of the involvement of local authorities in the field of economic policy;
6. An investigation of the problems of a specific production sector which is of particular importance to the economy of the city;
7. An analysis of the time patterns which govern the every day life of the city and its citizens and how this information might be used in social services provision.

At the 9th Conference of Mayors of the World's Major Cities held in Turin in April 1980, the Turin working group presented a report on its research activity titled "The city: critical dimension – community of citizens" that was debated by the mayors present. The discussion was dominated by the speeches of three people who represented significant aspects of the international debate at the time: Diego Novelli, Mayor of Turin (1975-1985) and President of the World Federation of United Cities (1979–1982), Aurelio Peccei, President of the Club of Rome (1968–1984), and Adam Schaff, President of the Board of Directors of the Vienna Centre (1969–1989). These three eminent politicians and intellectuals proposed that the Vienna Centre, which had previously been responsible for the CURB project, was given the task of organising and co-ordinating the new project. The cities that took part in the Turin International Project were Cologne (BDR), Cracow (P), Dresden (DDR), Lille (F) and of course Turin – because they all had significant problems, and because they offered a sample which comprised cities in countries with market economies as well as cities in countries with planned economies. In 1980, Lille opted to

go out of the project and was replaced by Tallin (Estonia, USSR). To ensure continuity with the CURB project, from 1980 to 1983 the co-ordinator of the Turin International project at the Vienna Centre was Armando Montanari. Christiane Villain-Gandossi subsequently held the position until the project's conclusion in 1987.

Hence,the innovative factor was not only a new process of dissemination, but also, and above all, a new way to encourage the twinning of cities. Zelinsky (1991) retraces the history of these twinning's, the first of which dates, in Europe, to 1918, i.e. after the First World War, between a Swiss and a German town. But the Organisation for Sister Cities International was founded in 1967 following what the American President Dwight D. Eisenhower had called "people-to-people diplomacy", which was needed to overcome the divisions and brutality of the Second World War. Although this policy developed fast in the 1970s and 1980s, it was implemented exclusively between Western European cities. The Turin International Project indicated possible changes and the inevitable problems that would result:

1. Western and Eastern European cities, which were separated at the time by the Iron Curtain, could attempt to co-operate, even if any such co-operation was to be strictly controlled;
2. The scope of twinning until then had been to organise events and shows and exchange gifts, and mainly to organise big lunches and dinners. While all of this had certainly helped to thaw the icy relations between West and East in the wake of the Second World War, twinning could no longer continue unless it managed to tackle the concrete problems of each community;
3. With towns beginning to tackle concrete problems and potentially involve citizens in this process, it was absolutely necessary to supply information and encourage discussion and debate. This is how an early, basic form of dissemination came to be tested;
4. Local administrations' vision of their participation and involvement were limited to their own electoral terms. These periods did not coincide and did not provide enough time to carry out the required research;
5. Comparative research can be restrictive when it comes to selecting the data to be examined, and the comparison of results can lead to conclusions that are not always fully in line with the expectations of each administration;
6. The Turin International Project was undoubtedly an interesting example of dissemination, but it is unlikely to be remembered for its scientific results and publications (Allan, 1982; Lever, 1989).

Each of the municipalities that made up the Turin International Project had a research group involving researchers from that particular city. While this ensured optimal dissemination, it also made the research problematic in some ways. The project was built on two methodological references that were not entirely compatible with international comparative research. Firstly, the cities made it clear that they did not intend to follow a common research programme based on a single methodology, with identical data being collected and analysed. They decided on research that would be analogous to the greatest possible extent and that, while based on independent criteria, would supply results useful for some form of comparative analysis. A joint co-ordination meeting was to be held at least once a year. Secondly, the participating administrations wished to be free to exchange information on the policies adopted with regard to themes of immediate interest to each city. Any city could organise a meeting to discuss themes of interest to itself.

6. Multidisciplinarity and dissemination: Two aspects of the same process

Previous reference has been made (Montanari, 2013b) to Charles Percy Snow's work (1959) to attract the attention of intellectuals to the barrier that had come up between two cultures, science and the humanities. It was a subject Snow was well placed to discuss, being a man of letters as well as a scientist. Snow's concern, and that of the people who have discussed his work over the past half-century, was centred on two main objectives. The environment and the people who use it to survive on an everyday basis, are inter-related in complex ways that cannot be understood unless scientists, social scientists and humanities scholars work together. But the other problem is that, over time, the lack of collaboration has created a barrier; the lack of communication has given rise to languages understood only by the initiated, which slow down any form of communication.

The Internet has made it possible to increase possibilities for collaboration in previously unthinkable ways, and to extract significant information from the huge quantity of data produced in laboratories. Using this opportunity means being able to improve the way in which research is done and speed up the diffusion of discoveries while making the most of opportunities offered by a kind of programmed serendipity. More widespread diffusion of the results of knowledge will also make it possible to modify the role of scientific research in society. The EC requires EU-funded research projects to make their results openly accessible and to maintain constant contact with the end users that each project identifies beforehand. While processes are already fully shareable, procedures need to be opened up more completely.

7. Multidisciplinarity and dissemination: Italo Calvino's contribution to the study of urban settlements

All the world's cities have a shared development model because the economic and cultural impetus behind the growth of these cities has a common matrix, which is stimulated by communication and information exchange. This has been a topic of discussion within the International Geographical Union (IGU)'s commissions for the past forty years. Berry (1976) mentions that the main topic at a meeting of the Committee on Urbanisation of the Social Science Research Council, in the early 1970s, was that of reviewing research on urban settlements so as to identify structures, processes and growth phases that could contribute to a general theory on the phenomenon of urbanisation, irrespective of time- and space-related criteria in specific cases. Without a general reference theory, the social sciences could not be defined as sciences in their own right. The idea of finding a shared reference for urban development processes caused a great deal of controversy for at least a decade, as it was thought that this could contribute to possible conflicts of interpretation between Western countries with market economies and Eastern European countries with planned economies, and also globally, between 'North' countries with mature economies and the developing 'South'.

In a book that was greeted with more criticism than approval, Berry (1973) wrote: "What I do in this book is to disavow the view that urbanisation is a universal process." When the Commission on Processes and Patterns of Urbanization of the IGU (Jones, 1975) took a stance (including for ideological reasons) on the subject, it did so very clearly, explaining that the phenomenon of urbanisation - which had spread to all seven continents - was the result of quite different situations and factors. So it would not be possible – or even wise – to attempt to reduce the phenomenon to a model. Meanwhile, the writer Italo Calvino (1923–1885) had published *Invisible Cities* (Calvino, 1974) in which, in a poetic interpretation, he said that every city derives from a common model, and that therefore, despite their differences, all cities have a reference model.

Figure 1.2. the invisible cities published in English (Calvino, 1974).

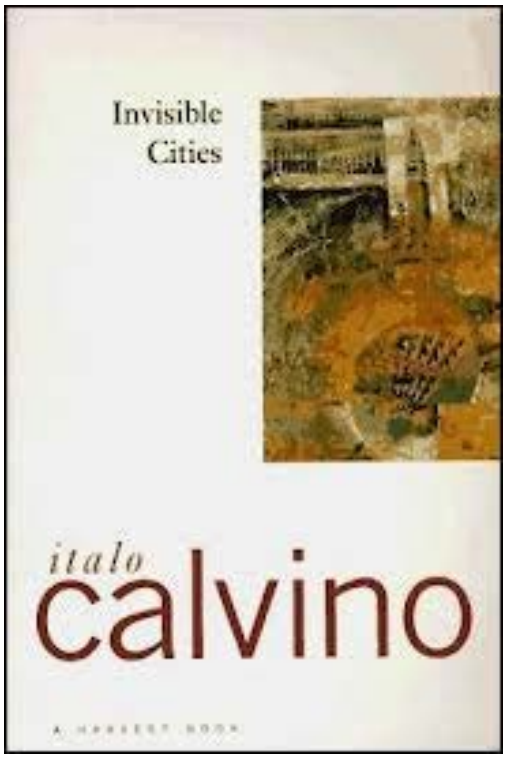
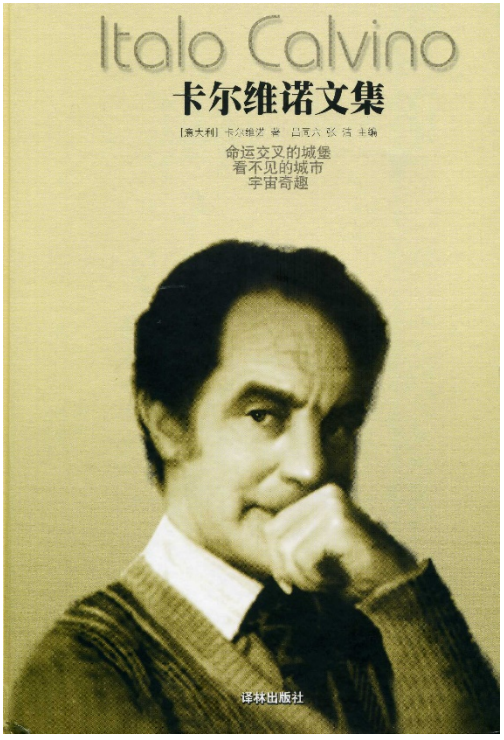


Figure 1.3. the invisible cities published in Chinese (Calvino, 2001).



This particular novel is situated in what critics define as the period in which Calvino (fig. 1. 2 and fig.1.3) was seeking a closer relationship between literature and science, and assimilating structuralism and combinatorial logic. The general model contains all the standard features of a city; so, as a good public administrator, Kublai Khan, the Tartar emperor who is conversing with Calvino's fictitious Marco Polo, merely had to envisage exceptions to the rule and calculate the most probable combinations.

In opposing the official stance of geographers at the time, Berry (1976) included a page from *Invisible Cities* in the introduction to his book; the page where Calvino (1974) writes "and yet I have constructed in my mind a model city from which all possible cities can be deduced… - Kublai said - …it contains everything corresponding to the norm", followed by "I have also thought of a model city from which I can deduce all the others … - Marco answered - ... It is a model city made only of exceptions, exclusions, incongruities, contradictions". Calvino's book (1974) became extremely well-known in the U.S. (fig. 1.4 and fig.1.5), not least because it was a finalist for the Nebula Prize awarded by the Science Fiction Writers of America (SFWA) in the Best Novel category.

Figure 1.4. Calvino in New York (1959), photography published in Mondello (1990, p.93).

Figure 1.5. Calvino in a drawing by David Levine (1974).

Berry was undoubtedly fascinated by the way Calvino indicated, in his poetic interpretation, that every city derives from a common model. And since the general model contains all the standard features of a city, Kublai Khan, who is conversing with Calvino's fictitious Marco Polo, merely had to envisage exceptions to the rule and calculate the most probable combinations. Kublai Khan obviously represents what any modern individual, public administrator or private sector entrepreneur who has to take a decision about urban development should be.

Calvino's theory, which Berry (1976) used as a reference point, in marked contrast to the position adopted at the time by the International Geographical Union, has served as a conceptual starting point for comparative research in the social sciences over the past thirty years. Cities will continue to grow and to spread the impact of the changes they are undergoing to the surrounding territories in a number of different ways that will, however, always derive from a common model.

Therefore, identifying a benchmark urban model – however complex the task – must continue to be the objective of social science research so as to better understand processes, create a framework for policy intervention and continue to anticipate possible future scenarios. Based on the identification of a reference model, Berry (1976) was able to affirm that "a turning point has been reached in the American urban experience. Counter urbanization has replaced urbanization as the dominant force shaping the nation's settlement patterns". Research has since been carried out in a number of countries on every continent on the basis of this assumption. Drewett, Goddard and Spence (1976) applied these theories in the UK and concluded that "it can be postulated that centralization and decentralization in both the Standard Metropolitan Labour Area (SMLA) and Metropolitan Economic Labour Area (MELA) systems are dependent upon the

stage in the 'life cycle' of individual cities, which in turn may be related to their location relative to other cities in the urban system".

In the second half of the 1970s, Roy Drewett and some other colleagues approached the ISSC-Vienna Centre with the proposed European CURB project to study the growth and decline of urban areas in European countries with market economies as well as planned economies (Montanari, 2013b). When the results of the CURB project were published (Berg v.d., Drewett, Klaassen, Rossi, and Vijverberg, 1982), some representatives of Socialist countries once again mooted, for ideological reasons – as had been the case within the IGU a decade earlier – that it was impossible to use a single model to explain urban changes. At the end of a prolonged debate that lasted well into the night on the last day of meetings held at the headquarters of the Polish Academy of Sciences on 23-26 November 1979, a compromise was found: the two-page summary specified, among other things, that "the form, scope and rate of urbanization depends on the level of socio-economic development attained, the geographic conditions, and the institutional structures of the given country, and on the preferences of individual population groups, authorities, enterprises, and other factors participating in the processes of socio-economic development… (Herman and Regulski, 1982)".

8. Multidisciplinarity and dissemination: Italo Calvino's contribution to the study of food and the landscape

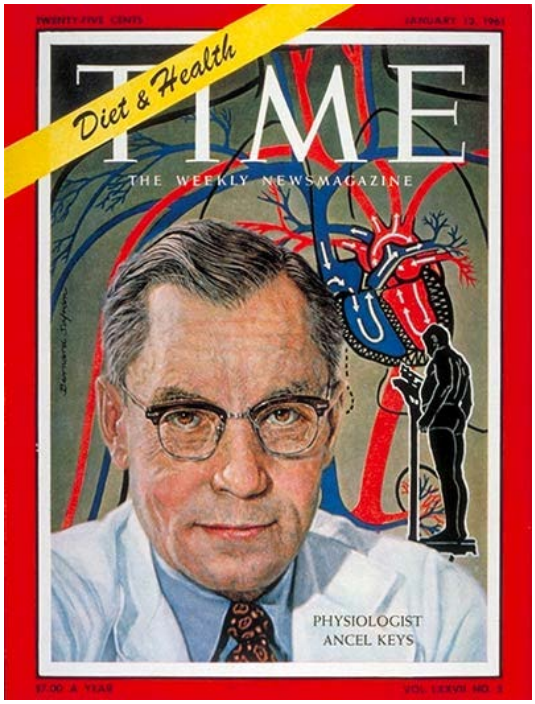
Calvino's interest then spread to other subjects. On 30 March 1983, he gave the James Lecture at the New York Institute for the Humanities, subsequently published (Calvino, 1983) in the *New York Review of Books*, during which he disclosed that he was considering writing a book on the five senses. The unfinished book would subsequently be published after his death (Calvino, 1988). In the introductory part of his lecture, Calvino discussed the relationship between the written and the spoken word, which lead to a further element of discussion (often pondered within the social sciences) about the instrument of oral expression, and the language in which it is expressed. All these elements profoundly influence the relationship between the person producing communication and those receiving it: "For a lecture, on the contrary," Calvino said, "I must face not only the audience but also the question within me: What is the audience expecting from my words? When I must lecture in a language that isn't my own language, a supplementary question arises: Are the words I'm thinking the same as the ones I'm saying and the same the listener will receive?" (Calvino, 1983).

Further, the subject is developed when we go from individuals who can choose between the written and the spoken word, depending on the circumstances to civilisations dominated by the written word and others in which the written word is totally inexistent. "Through the centuries, the habit of reading has changed Homo sapiens into Homo legens. But this Homo legens is no more sapiens than his ancestors. The non-reading man could see and hear many things we aren't able to perceive now: the tracks of the beasts he was hunting, the signs of the approaching rain or win. He could tell the hours of the day from the shadow of a tree or those of the night from the position of stars upon the horizon. And as to hearing, smell, taste, and touch, his superiority over us is undeniable. (Calvino, 1983)" Calvino referred to taste in a story originally published with the title "Sapore sapere" ("Learning to taste"), in which he explains that a true journey is one that forces us to experiment with a different reality to the one to which we are used (Calvino, 1988).

As with every form of human mobility, travel forces us to meet, confront and even clash with all that is different. When it comes to food, travel forces us into a complete change of diet that Calvino expresses as the need to 'swallow' the country we are visiting – its flora, its fauna and its culture. He specifies that he is referring not only to the composition of raw materials, but also to their treatment and use. He manages to express a seemingly contradictory concept: the food to which he refers is a complex cultural object, more intangible than intangible, which the traveller must, however, physically swallow, "making it go through the lips and oesophagus".

The idea that the country the traveller is visiting has to be 'swallowed' like any other food, leads us to a few similarities with the science of nutrition, particularly the Mediterranean diet. According to the dietician Donini (2012), "the Mediterranean diet is a collection of food-related traditions, artisanal know-how and techniques, imagery and landscapes that people living around the Mediterranean Sea recognise as being an integral part of their cultural heritage". The reference is to the work of Keys and Keys (1975), who published the results of a study initiated in the 1940s concerning the diet of ordinary people in Naples in the early 1950s: large quantities of fresh fruit and vegetables, pasta and bread, with small portions of meat and fish eaten only twice a week. The biologist and physiologist Ancel Benjamin Keys (1904-2004), who became well known to the general public after *Time* magazine put him on the cover of Issue LXXVII n.3 dated 13 January 1961, suggested imbibing the Neapolitan culture and landscape as a way to prevent cardio-vascular diseases (fig. 1.6).

Figure 1.6. Ancel Keys on the Time magazine cover (1961).



Donini (2012) maintains that "the duration and quality of life stems from balanced consumption of foods rich in fibre, antioxidants and unsaturated fats. Mostly plant-based foods, therefore: olive oil and olives, fruits, vegetables, cereals (preferably unrefined), pulses, dried fruit and fish; moderate amounts of milk and dairy products (mainly cheese and yogurt); occasional consumption of meat and cold cuts, and wine, if desired, with the main meals." However, Donini adds that "the evolution of our lifestyles and agricultural production methods, as well as scientific knowledge, mean that the model has to be constantly adapted – while maintaining the key points – to society's changing needs."

With regard to the need to constantly adapt the model, the scientist Carlo Cannella (1943-2011), then president of the Italian institute for food and diet research (Istituto Nazionale di Ricerca per gli Alimenti e la Nutrizione – INRAN), presented the New Pyramid of the Mediterranean Diet (NPDM) at the end of the third international conference organised by the Inter-university International Centre for Mediterranean Food Culture (CIISCAM, Sapienza University of Rome) in Parma on 3 November 2009. At the base of the NPDM are plant-based foods such as cereals, vegetables and fruits, which make up the main meal, with other foods needed to complete the meal depicted in descending order, depending on the recommended daily or weekly intake (Cannella, Giusti, Pinto, 2007). The conference drew on social sciences research to conclude that other key elements are physical activity, sitting down with friends and

family to eat a meal, and eating locally-grown, seasonal food (del Balzo, Diolordi, Pinto, Giusti, Vitiello, Cannella, Dernini, Donini, Berry, 2012).

The diet and behavioural recommendations were easily illustrated in the form of a pyramid chart that has become a self-standing tool of scientific dissemination using infographics. Each food item shown in the NPDM is the result of a chain that has developed in the territory where it is produced; it is the conceptual representation of the area's natural and cultural resources. In other words, it is an instance of the relationship between food, its production, the place of production and the culture of the place's inhabitants, which is summed up in the definition 'Geography of Taste' (Montanari, Costa, Staniscia, 2007).

The experience of visitors and consumers who 'swallow' the landscape to gain a better understanding of the culture of the countries they are visiting has been summarised as 'Taste of Geography' (Montanari, 2009; Montanari and Staniscia, 2009). The latter concept, developed within the field of geography, was introduced by a historian, Massimo Montanari (2002; 2004), who – repudiating history, paradoxically enough – used it to explain that historical archetypes have never existed, in that "the taste of geography does not belong to the past". Indeed, interest in so-called 'regional' cuisine only really began to grow after the early stages of industrialisation. He admits that regional differences have always existed, and therefore glorifies geography by saying that the concept of territory as a positive factor is a "new invention" (Montanari M., 2004). If there were any surviving doubt about Calvino's innovative interpretation, it is enough to recall that he urges consumers not to eat foods that are "exotic", and hence without a territory, because by doing so, they will restrict their experience to what they could just as well watch on television.

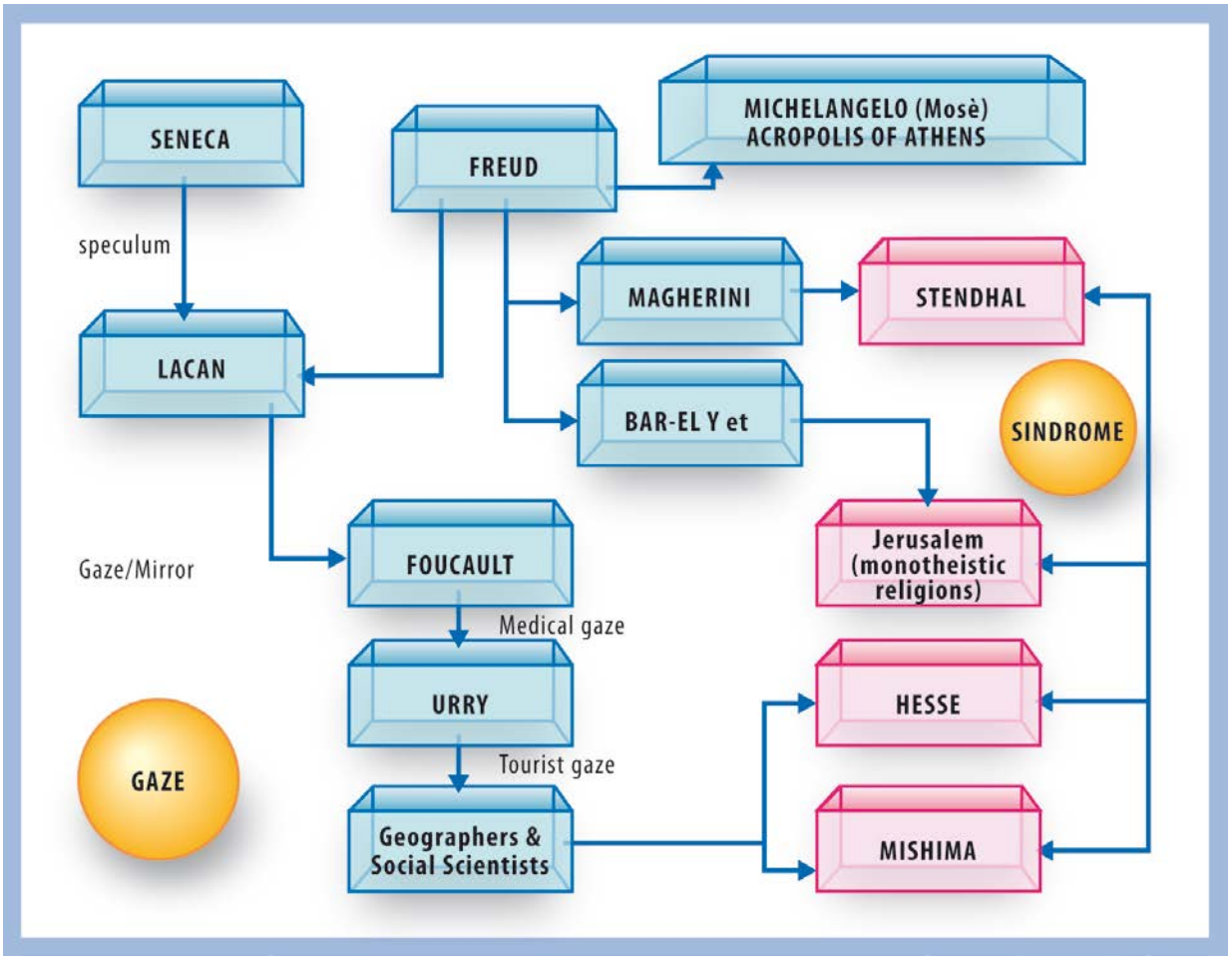
The transition from the Geography of Taste to the Taste of Geography has taken place through the interpretation of the concept of the "gaze". Several fields including medicine, psychology, philosophy, sociology and geography have contributed to giving the "gaze" a meaning relevant for human mobility. Shaw and Williams (2002) remind us that the tourist gaze is built on the basis of significant signs and elements of the landscape. Tourists are great collectors of these signs, which are filtered through to them by a dense network of information – in part exclusively cultural, but also messages aimed at creating and marketing touristic places. Together with other geographers, Shaw and Williams (2002) introduce the concept of the "gaze" as applied to tourism, using the work of the sociologist John Urry (1990) as their benchmark. Urry had based his own concept on the work of the philosopher and social theorist Michel Focault (1926-1984), who had introduced the concept of the "medical gaze". There are tourist resources that are the

result of a romantic or collective gaze, but they can also be historical or contemporary, or simply true or false resources, hence built from nothing.

The creation of unreal images charged with signs and meanings are the instruments that many tourists create for themselves, the better to escape their daily routine. Tourism that is attracted by cultural heritage prevalently uses the attraction in itself as a resource. Nor can one underestimate the powerful social metaphor of the cultural attraction as a means to represent the relationship of the visitor to his own history and the history of other cultures.

We can go back in time and trace the origin of the "gaze" concept to the work of the neurologist and psychoanalyst Sigmund Freud (1856-1939) and that of the psychoanalyst and psychiatrist Jacques Lacan (1901-1981), which in turn leads back to the Roman philosopher Lucius Annaeus Seneca (4 B.C.–65 A.D.), as seen in Fig. 1.7 and explained in greater detail in a recent article (Montanari, 2013a).

Figure 1.7. The gaze, the powerful social metaphor of the cultural attraction as a means to represent the relationship of the visitor to his own history and the history of other cultures.



The latest version of the NPDM was produced during the World Forum for Nutrition Research, held in Reus, Spain, from 20-21 May 2013, with a reference territory proposed for each food item so as to go from the geography of taste to the taste of geography. This latest version of the Mediterranean diet pyramid not only refers to healthy eating and individual well-being, it also makes it possible to contribute to the development of the territory by setting up networks of small and medium businesses operating in the production and services sectors.

9. Science dissemination: Functional illiteracy and national prosperity

According to the Organisation for Economic Co-operation and Development (OECD), the term "functional illiteracy" applies to an individual who cannot engage in all those activities in which literacy is required for effective functioning of his group and community. This means that even people who can use reading, writing and calculation may have knowledge gaps if their skills are not adequately shored up by the spread of innovations introduced by scientific research.

The Human Development Report 2013 (UNDP, 2013) points out that when developed economies stopped growing because of the 2008-2009 financial crisis, the emerging economies continued to grow. Justification for this growth was provided by GDP figures and international trade growth figures. The UNDP (2013) also points out other factors such as social equality and democratic management of public administrations, continuous investments in human development and the creation of opportunities for greater human progress.

The results of the most recent Programme for International Students Assessment (PISA) conducted in 63 countries in the course of the year 2009 reveals that many countries have made considerable progress in the quality of learning outcomes. Students in Shanghai, China, outscored students in 62 other countries in reading, maths and science. Students in the Republic of Korea, Finland and Hong Kong SAR (China) topped the scale in reading; Singapore, Hong Kong SAR (China) and the Republic of Korea in mathematics, and Finland, Hong Kong SAR (China) and Singapore in science. In the agricultural sector, China, with 1,100 research institutions at universities and academies of science, has taken over leadership in South-South co-operation with African countries. In countries that have sustained growth in the long term, governments have generally invested both money and energy to educate their citizens and enhance the cognitive skills of their human capital, and the results of this can been seen in the performance of the science and mathematics students who took the test (UNDP, 2013).

In the early 1980s, the Royal Society had already pointed to the fact that public awareness of science is lacking; and it subsequently published a report titled "Public Understanding of

Science", which was put together by a working group headed by Dr W.F. Bodmer, and is hence also known as the Bodmer Report (Royal Society, 1985). The report examines the relationship that individuals, civil society and industry have with science and technology, starting from the premise of a system in which individuals communicating science are addressing other individuals whose cultural level is adequate to receive what is being communicated to them. The report emphasises the importance of this fundamental relationship in contemporary society, but can only deplore the continuing deterioration of the public perception of science.

An enhanced understanding of scientific issues could help individuals to take better decisions about the right diet to follow, the vaccinations to get, personal hygiene, and safety at home and in the workplace. The report also sets forth the importance that science should be given in the school syllabus, in the work of Parliament, in the day-to-day work of journalists and in industrial production. Scientists, for their part, should learn to communicate better with everyone, particularly with the media. Scientists must be prepared to communicate personally, not delegate the task to others; they must learn to consider dissemination a duty and an integral part of research. In actual fact, the best scientists see research as their only objective; this "culture" is "imposed" on them from the moment they enter university. As a result, they try to avoid jobs in the administration and the government, preferring to stay in their laboratories and carry out research, even if this means giving up the possibility of better pay.

The Bodmer Report notes that, for these reasons, there are few scientists in important posts in government, public administrations and industry. While this attitude is hard to change, people in key positions should at least be required to have some ability to understand scientific issues, even if they do not have a scientific background. This can be achieved by making scientific education more widespread, at school and subsequently in society. Antonio Ruberti (1927-2000), Italian minister for research and technology from 1987 to 1992 and commissioner (1993-1995) for research, training and education when Jacques Delors was President of the European Commission, acted in keeping with the recommendations of the Bodmer Report. During his time in the Italian government, he introduced Law 113 (1990), subsequently extended with Law 6 (2000), for the diffusion of scientific culture through a commission that would coordinate the organisation of the Scientific Culture Week and provide financing to promote the historical scientific heritage as well as scientific dissemination.

As European Commissioner, Ruberti introduced the first European Week for Scientific Culture from 22 to 27 November 1993; the press-release for the event stated that its objective was "Making science, and in particular science in the Community, more accessible to the man in the

street". Ruberti (Ruberti and André, 1995) believed that despite all the technological advances of the 20th century, science was not being adequately recognised for the key role it had played.

When the media and the government mention culture, they are referring to the arts, literature, cinema and theatre, certainly not to science and technology. Even people working in scientific sectors are so focused on the objectives of their research that they disregard the scientific culture, history and basics of their particular sector. In an article he wrote for the Italian newspaper *Il Sole 24 Ore*, Ruberti (19.11.1996) affirmed that education is the highway to scientific dissemination, and that the Italian and European weeks for scientific culture have provided a reference point to stimulate and support public awareness of science. At a speech at Rome Rector Sapienza University (08.11.1999), of which he was (1976-1987), Ruberti emphasised that "the research professor must overcome the concept of knowledge accumulation as hoarding and affirm the importance of the contextual diffusion of research results. It is therefore at the very roots of the University that the values of the freedom of research and the democratisation of knowledge are to be found."

10. New tools and new cultures

The contribution that cinema and television have made, or at least attempted to make, in bringing science closer to the general public cannot be overlooked. In Italy, since 18 March 1981 Pietro Angela has hosted the science programme "Quark" on the leading television channel, Rai 1. The programme has changed over the years, but it has maintained some key elements such as the presence in the studio of authoritative scholars such as Danilo Mainardi (ethology), Carlo Cannella (food science), Elisabetta Bernardi (nutrition), Paco Lanciano (physics) and Alessandro Barbero (history).

Unlike most scientists, Carlo Cannella, who died in 2011 aged only 67, was good at talking to the general public. He has already been cited in this volume for his ability to use illustrative tools such as the food pyramid, which create an immediate connection between the supplier of information and the receiver. His warmth endeared him to people and encouraged them to watch as he drew on his scientific knowledge to talk to them about food – how to choose, cook, eat and preserve it, thereby putting one of the principles enumerated in the Bodmer Report into practice. Cannella also wrote a scientific but accessible book on common misconceptions about food to debunk myths about what people should or should not eat (Cannella and Carrada, 1997).However, he always made it clear he was first and foremost a scientist – a necessary

clarification at a time when any number of people with no specific training feel entitled - to talk about food, nutrition and diet in newspapers and on television.

Other major international television channels had also produced science programmes made and presented either by scientists or by celebrities, whose fame helps science shows to gain viewers. Brian Edward Cox, a brilliant physicist and a professor at the University of Manchester, is better known to the general public as the presenter of many BBC science programmes on astronomy and physics. The American actor Morgan Freeman hosted "Through the Wormhole", a science programme that aired on the Discovery Channel cable and satellite television in 2009. Since 2006, the American astrophysicist and science communicator Neil deGrasse Tyson has hosted the popular PBS series "NovaScience Now". The French oceanographer and filmmaker and Jacques-Yves Cousteau (1910–1997) brought popular attention to undersea exploration and the issue of marine conservation with his film "The Silent World", which won the Palme d'Or at the Cannes Film Festival (1956). Cousteau spent many years doing undersea research from on board his ship *Calypso*, after which John Denver named a song in 1975.

Unfortunately, it cannot be denied that the research world has never encouraged – and in fact has even obstructed – scientific dissemination. Cattaneo (2013) writes that "we researchers think that because we are so familiar with the subject of our work, communicating it to the public is easy, and with this firm conviction, we talk without paying enough attention to the people who are listening to us." Carrada (2006), however, points out that the academic world has shown little appreciation for those who have devoted themselves too assiduously and too successfully to scientific dissemination. As a result, dissemination is often carried out inappropriately, carelessly and without sufficient means, or is considered an obstacle to the advancement of one's scientific career, and therefore a handicap for anyone who goes about it seriously.

Carl Sagan (1934-1996), the American astronomer and science communicator, featured in a number of popular TV shows and films such as *Cosmos*, *Contact*, *Good Morning America* and *Horizon*. The television series *Cosmos*, which covered an array of scientific topics starting from the origin of life, aired for the first time on PBS in 1980. It has been broadcast in more than 60 countries, and watched by more than 500 million people. It was an extraordinary example of scientific dissemination in which the globalisation of research topics was accompanied by the globalisation of the tools and methods of dissemination, helped in no small measure by Carl Sagan's scientific reputation and authoritative tone. And, as Carrada (2006) points out, "in 1992… he was denied membership of the National Academy of Sciences….Too many colleagues turned up their noses at his tireless activity in spreading scientific news, which had made him perhaps

the most famous scientist in the United States, and one of the most vibrant defenders of science in the world".

Giovanni Carrada, who joined Pietro Angela's team of presenters on "Quark" in 1994, was commissioned by the Directorate General for Research of the European Commission to write a manual for scientists to teach them how to communicate their field (Carrada, 2006). There is little point quoting from his "Scientist's Survival Kit" here; quotations used out of context would only take away from the pleasure of actually reading it. However, it is worth singling out the passage that quotes, tongue-in-cheek, the movie character Indiana Jones saying: "Nothing shocks me. I'm a scientist". The quotation takes one aback, not so much because it appears in this otherwise serious survival kit, but because it instantly brings to mind some of our scientific colleagues – and indeed reminds us of ourselves, for, like Indiana Jones, we are often unaware of getting ourselves into ridiculous situations.

Perhaps we should place a mirror at the entrance to every laboratory to allow scientists to check their appearance and leave their Indiana Jones hat and whip in the cloakroom. There are many indicators that, for a variety of reasons, the prevailing climate has changed, and that society will now accept an Indiana Jones type of scientist only in the movies. Carrada (2006) says: "…English high energy physicists lost out, when a few years ago they received the following request from Her Majesty's Minister of Scientific Research: 'In thirty lines explain why British taxpayers should invest a substantial part of their resources in Higgs' Boson research'." Carrada berates the scientists concerned: "What those physicists wrote is not known, but they did not convince the minister." However, on the same page he cites a more felicitous example of a case of researchers winning a referendum granting them financing for their research on embryonic stem cells. The referendum was held in California in 2004; presumably, the scientists managed to convince public opinion that, "thanks to the people's voice, California will likely become the most advanced centre in the world for this type of research too". Carrada draws on these two incidents to wisely point out: "Today society no longer signs blank checks for anyone, not even for science." This is a principle we can all agree with.

However, on what ground is society capable of judging, appropriating and rationally evaluating the research sectors it wishes to subscribe to and support? The way in which these judgements are made are being studied and explored, but they remain somewhat inexplicable. Carrada says: ""Our mind, however, literally abhors scraps of information, the lack of meaning and significance, and an image of the world is reconstructed using the scraps available, unifying them with ties which are often arbitrary and irrational, filling in the blanks with what we have."

In the past few decades, all researchers have begun using common rules and codes (with a few field-specific differences) to communicate with each other; in more recent times, they have even been using a common language for the purpose. In recent years it has been possible, albeit not without controversy, to identify a common yardstick to evaluate the importance of the scientific message, its scientific accuracy and the ease with which it can be transmitted within the scientific community.

However controversial, this yardstick evaluates the incisiveness of scientific communication using a concise quantitative value called "Impact Factor".Whether the Impact Factor actually manages to supply an objective evaluation as compared to the tools that have so far been used, remains to be proved. The measurement method may be questionable, but there is no question that a concise value must be used, one that is simple (but not ordinary), which can be understood by all at a time when ideas must be able to cross all disciples and cultures. Nevertheless scientific dissemination must use different parameters and tools. "Public communication has different requirements; it follows different norms; and above all, it takes place in a different context. Most of the problems which occur during an exchange of ideas with society arise when these differences are not taken into consideration." While it is still hard to teach a scientist to become a scientific communicator, Carrada (2006) supplies us with his idea of the way scientists should behave when they leave their laboratories to go and meet the press or the general public.

The subject of scientific dissemination is a topical one throughout Europe; particularly so in Italy in 2013 because of the Stamina method – a controversial therapy for neurogenerative diseases that some illustrious scientists maintained was backed by public support rather than scientific criteria. The Italian National Research Council (CNR) and Academy of Sciences therefore decided to organise a debate on "Journalism and scientific culture in Italy" on 12 November 2013, to be coordinated by Gilberto Corbellini, a professor of the history of medicine at the Sapienza Rome University, and Armando Massarenti, a philosopher and scientific communicator. The event was organised around three themes: (i) Italian scientists are accusing scientific journalists of manipulating information and misleading public opinion. How did scientists manage to get their communication wrong? (ii) In their defence, the journalists say they used available sources of information and that in any case it is not their job to verify the accuracy of research. What are the limits of Italian scientific journalism? (iii) Problems arising at the level of political decision makers are not vetted by the scientific community. What should and can be done to ensure that policy makers use technical and scientific data when they draw up laws?

With regard to the last question, the meeting made reference to the OECD and UNDP (2013) reports, which show that Italy is the developed country with the highest level of functional illiteracy. Politicians represent this situation, and therefore reflect the scientific ignorance of the entire community. At a time when Europe's economic performance is measured in terms of spreads, e.g. between Italian BTPs and German bunds, it is easy to refer to the spread of scientific culture between Italy and other developed countries.

Intervention by the European Central Bank (ECB) will not suffice to reduce the spread; action will have to be taken at the educational stage, in every category and at every level, over at least two generations. That is effectively a very long period, and therefore attention must essentially be focused on more suitable short-term policies. In her address at the 12 November 2013 meeting, Elena Cattaneo, the pharmacology professor who was made a senator on 30 August 2013 for scientific merit, emphasised that the most urgent steps are to remedy the poor aptitude of the Italian political class for scientific culture, and to create adequate space in the media to popularise scientific culture (Cattaneo, 2013).

11. Conclusions

Numerous studies and experiences on the subject of scientific dissemination have shown that the sector would appear to have three stakeholders in particular: scientists, scientific communicators and public administrators. The relationship of these three stakeholders to each other determines the volume and quality of information provided by those who produce scientific dissemination. Civil society would appear to be the only target of scientific dissemination.

The relationship between these four components is constantly changing, influenced in part by the introduction of ICT tools which have accelerated relationships and contributed to educating a public that is aware of its own rights and therefore wishes to assert its opinion on how scientific research should be funded.

It is undeniable that training could greatly improve the quality of the debate, and hence of the solutions proposed. But training is a process that requires time – a few generations, and people cannot meanwhile suffer the consequences of the serious mistakes that are still being made.

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CHAPTER 2.
A Review of FAO Dissemination Tools and Techniques

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1. Introduction

The Food and Agriculture Organization (FAO) is the largest, Rome based, organization of the United Nations (UN) system. FAO was founded in Canada on 16 October 1945 and was located in Québec City until 1951 when it was moved for a short period to Washington DC and then to Rome, its current headquarters. For more than 60 years, FAO has been the "place" where 194 countries (current number of member nations) meet and define the policies and actions aimed to: i) achieve the food security in the developing countries; ii) optimize the agriculture and food production; iii) improve the life standards of rural populations and; iv) manage the impact of climate changes.

Today, more than 80 low-income developing countries suffer from chronic food deficits and over 840 million people go hungry. In 1996 FAO held the World Food Summit where world leaders gathered in Rome and committed their countries to reducing the number of hungry by half by the year 2015. FAO was seen to play a major role towards this objective by encouraging and monitoring progress, and re-focussing its own programmes on the goals of the Summit.

To better guide its work for the two decades following the World Food Summit, FAO developed «The Strategic Framework for FAO, 2000-2015», which was approved by the FAO Conference at its 30th Session in November 1999. FAO's Strategic Framework is built on 5 major corporate strategies to:

a) contribute to the eradication of food insecurity and rural poverty;

b) develop, promote and reinforce policy and regulatory frameworks for food, agriculture, fisheries and forestry; create sustainable increases in the supply and availability of food and other products from the crop, livestock, fisheries and forestry sectors;

c) support the conservation, improvement and sustainable use of natural resources for food and agriculture; and

d) improve decision-making through the provision of information and assessments and fostering of knowledge management for food and agriculture.

Among other duties, one of the major tasks undertaken by FAO is the diffusion of reports, documents, project briefings, statistics, databases, etc., to disseminate and share the knowledge among all interested people.

What is the FAO approach to achieve the above objective? Even though each department has its own *modus operandi,* all the dissemination process is based on a single point of entry: the FAO WEB site (www.fao.org), where, through an easy navigation path, one can find and access any type of available information. The site is has been visited by over 2 million users per month in 2013.

2. Dissemination

As stated in the Article 1.1 of FAO's constitution, «the organization shall collect, analyse, interpret and disseminate information relating to nutrition, food and agriculture». Moreover, the key strategy of FAO is to improve decision-making through the provision of information and assessments, and fostering of knowledge management for food and agriculture. In support of these critical functions, FAO established the World Agricultural Information Centre (WAICENT) as a corporate framework for agricultural information management and dissemination.

One of the fundamental principles of WAICENT is that is based on a participatory and decentralized approach. Each technical unit is responsible for collecting, analysing, interpreting and disseminating the information for which it is responsible. The amount of information and knowledge acquired, managed and published under this approach is enormous as manifested by the half-million HTML pages available on the corporate web-site. However, at the same time, FAO strives to provide an «integrated information resource base, with current, relevant and reliable statistics, information and knowledge made accessible to all FAO clients». Without the guidelines and standards offered by the WAICENT framework, it would be virtually impossible to obtain integrated access to FAO's information under a decentralized approach and it would be very difficult to cover the many interdisciplinary and cross-cutting themes that FAO is mandated to address.

The vast amount of information generated by a large organization such as FAO, together with the apparent dichotomy between decentralized production on one hand, and a desire for integrated and interdisciplinary information access on the other, makes the WAICENT framework a rather complex institutional arrangement.

The following figures show first of all the channels used for information dissemination, then three examples of different ways to disseminate information about FAO campaigns (through the WEB, television and printed material) and, finally, the types of reports in use for the spreading of information about technical researches, workshops and publications.

Figure 2.1. Modes of Information Dissemination.

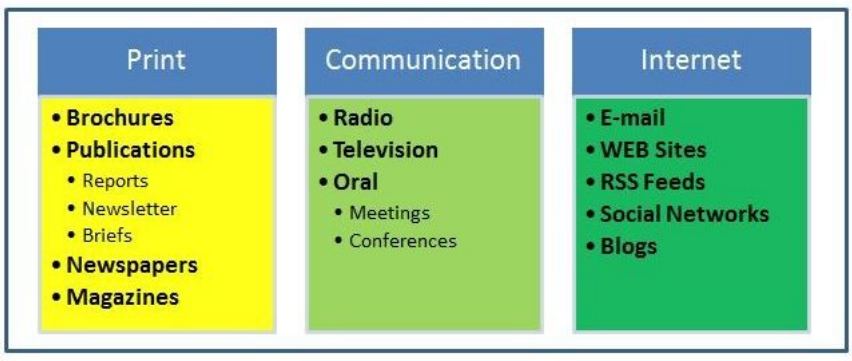
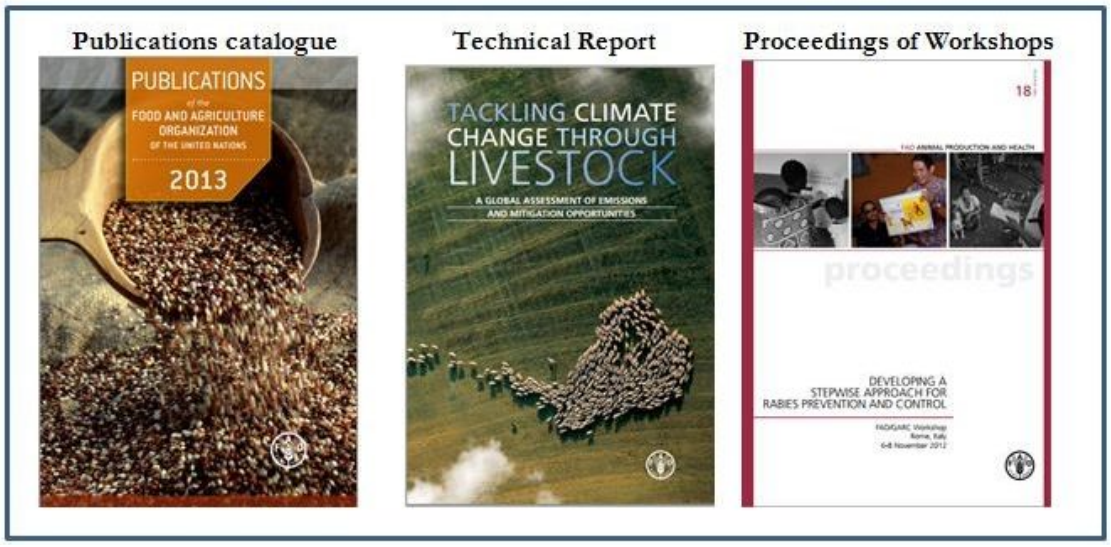


Figure 2.2. Examples of Dissemination Items produced by FAO for the 1 billion Hungry campaign.

Figure 2.3. Types of Report.



3. Statistical Activities for dissemination

The Statistics Division is part of the Economic and Social Department and is organized in five teams: Production and Trade Statistics Team; National Statistical Systems, Census and Surveys Team; Food Security and Social Statistics Team; Economic and Environmental Statistics Team; Statistical Systems and Data Dissemination Team.

The main activities of the Statistics Division are:

a. Collect, assemble, compile, analyze and disseminate statistics and related metadata on world food and agriculture through its corporate database FAOSTAT and to collaborate with member countries in improving the availability and quality of data.
b. Compile and disseminate food security indicators for monitoring progress towards the achievement of the MDG target on hunger and to prepare annual food supply assessments for all countries develop concepts, definitions, classifications, and methodologies on the global agricultural statistics program.
c. Assist in development and improvement of food and agricultural statistics by providing advice and technical assistance to member countries in: agricultural census and surveys; planning for agricultural statistics systems; strengthening national institutions; statistical data processing; dissemination of country data (CountrySTAT); food consumption statistics and derived indicators.
d. Provide technical inputs in the form of short-term expert and consultant services, short-term and practically-oriented training activities to build statistical capacity, and equipment and supplies.
e. Advocate for better coordination between the Ministry of Agriculture, other line ministries and the National Statistical Office and for the integration of the Agriculture Sector into the National Strategy for the Development of Statistics.
f. Promote the coordination of statistical activities performed by different FAO Departments and facilitate the development of an integrated FAO statistical programmer.
g. Represent FAO's statistical work in international forum and increase its visibility by strengthening partnership with major international organizations and development partners.
h. Advocate for the importance of sound food and agricultural statistics for the design, monitoring and implementation of effective and efficient food security and rural development policies.

The statistical data dissemination is very important for FAO, because, as a matter of fact, the publication of statistical data by means of printed reports or, even more, through the WEB, opens the gate by which millions of users can access to and interact with the largest UN organization. On the other hand, the data published are not always easy to understand, unless you are a field expert. It goes without saying that it would be perhaps necessary to diversify the dissemination making some data more accessible and manageable.

The term "dissemination" has become a familiar part of our vocabulary within higher education and it is easy, therefore, to talk about doing it without having a real grasp of what it means, "to disseminate" or what it is you are trying to achieve by doing it. It is helpful to think about dissemination in three different ways, as presented in the table below:

Table 2.1.

Dissemination for Awareness	It can be assumed that, at the very least, you wish people to be aware of the work of your project. This may be useful for those target audiences that do not require a detailed knowledge of your work but it is helpful for them to be aware of your activities and outcomes. Creating such an awareness of your project's work will help the "word of mouth" type dissemination and help you build an identity and profile within your community
Dissemination for Understanding	There will be a number of groups/audiences that you will need to target directly with your dissemination. This will be because you believe that they can benefit from what your project has to offer. It will be important, therefore, that these groups/audiences have a deeper understanding of your project's work.
Dissemination for Action	"Action" refers to a change of practice resulting from the adoption of products, materials or approaches offered by your project. These groups/audiences will be those people that are in a position to "influence" and "bring about change" within their organizations. These are the groups/audiences that will need to be equipped with the right skills, knowledge and understanding of your work in order to achieve real change.

4. Understanding and improving access to on-line information

The FAO Web site provides access to information on agriculture, forestry, fisheries, sustainable rural development, economics, food and nutrition. It is a comprehensive source of agricultural information, having approximately 500.000 web pages, over 100 databases, and thousands of documents. With over two million visits per month, the Web site gives access to the accumulated knowledge and expertise of FAO. The internet is certainly the newest and liveliest method for information dissemination and has attracted a lot of support and cooperative effort within the Organization.

An additional, more recent way of communication and dissemination is represented by the WEB Social Networks, such as Facebook, Twitter and others. These media have been also included in recent FAO dissemination and information-sharing campaigns.

Figure 2.4. Posterof the 4th Edition of the Run for Food Race.

Also special events have been organized and used for awareness campaigns, such as the "*1-Billion-Hungry*" (today renamed to "*Hunger-Ending*") that was launched in 2010, and the "*Run for Food*", that happens every year, on the 16th of October, in support to the World Food Day. These events, as well as others, are also supported by the participation of the so called "Good Will Ambassadors", very important and well known people belonging to the show, sport and culture milieus. For instance the 1-Billion-Hungry campaign was launched in 2010 with a video starring the actor Jeremy Irons and the testimonial of the Run for Food is the champion of athletics Karl Lewis.

Moreover, associations, institutions, schools, universities, public and private companies are invited to organize events to raise awareness, especially among young people. As a result a variety of meetings, conferences, workshops, etc. is organized, also with the cooperation of the Italian Ministry of Foreign Affairs and other governmental and non- governmental institutions.

FAO has been one of the first institutions to embrace the concept of institutional digital information repositories. In 1995, it established a support structure to foster the dissemination of agricultural information through WAICENT (World Agricultural Information Centre). This system was created at FAO to bring together and refocus the multiple information related enterprises, databases and publishing tasks of this large, multidisciplinary, international institution. There was also a need to reorient these activities to take advantage of the rapid

developments in information technology. The WAICENT framework integrates and harmonizes standards, tools and procedures for the efficient and effective management and dissemination of high quality technical information, including relevant and reliable statistics, texts, maps, and multimedia resources.

With the advent of the Internet in the 1990s, there have been enormous advances in information technology and the task of managing and disseminating information in a digital environment has become increasingly complex. As a result, at FAO the following tasks are assuming greater importance: i) to enable better access to FAO's information resources; ii) to promote partnerships with other agricultural information networks and; iii) to assist FAO Member Nations to build their own capacity to manage and utilize food and agricultural information.

Figure 2.5. Waicent Logo.

WAICENT comprises the following three principal computerized systems which are interactive, integrated and complementary:

a) **FAOSTAT** The Statistical Systems and Data Dissemination Team maintains, the FAO corporate database of standardized and consolidated national, regional and global statistics on food, agriculture and hunger, disseminating data on about 200 countries and territories from 1961 onwards. Since July 2010 open and free access is granted to all FAOSTAT data. The team supervises and organizes the updating of the FAOSTAT metadata system and data quality. Data and metadata contained in the FAOSTAT system are also published both in hard-copy (FAO Statistical Yearbook), as well as on CD-ROMs. In collaboration with the Country STAT initiative the team promotes the use of Statistical Data and Metadata eXchange Standard (SDMX) for automated harvesting procedures at national, regional and supranational partners. The Team is also in charge of the

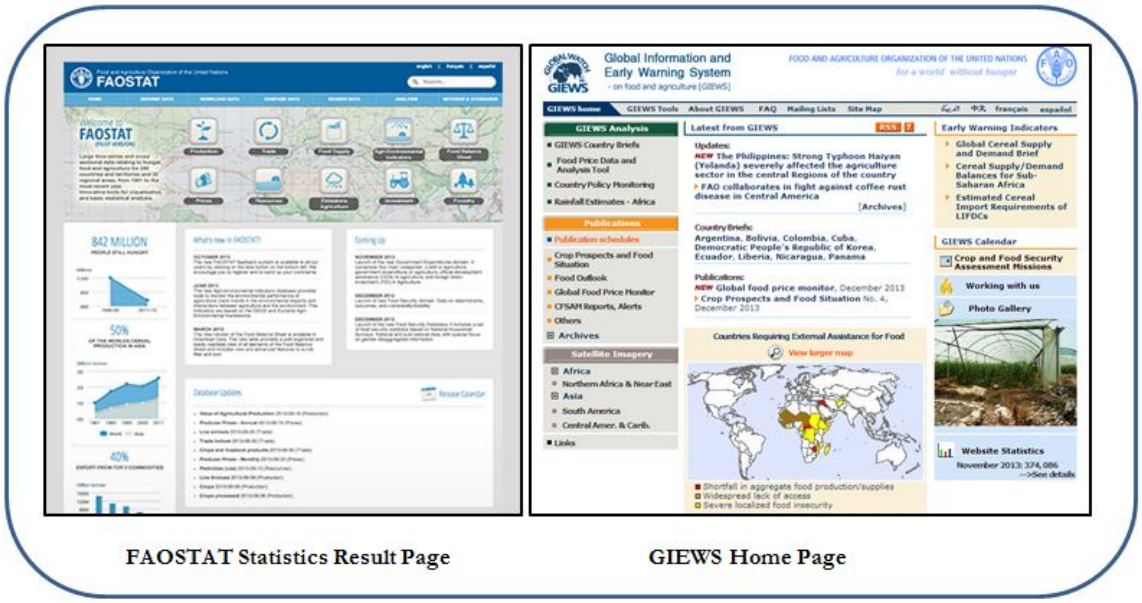
improvement and maintenance of the Statistics' Division Website, for the storage and dissemination of statistical information, which is made available on the internet, CD-ROM and diskettes, as well as in printed yearbooks and other special publications. Special software was developed to allow users to select and organise the statistical information into tables and charts that meet their individual needs.

b) **FAOINFO** which covers hypermedia information (viz. text, images, audio and video); the data are indexed by the FAO documents unit and the citations added to the FAODOC (Documentation) and AGRIS (the International Bibliographic Information System for the Agricultural Sciences and Technology) databases, with links back to the full text records. The data can also be easily output in HTML format for the FAO world wide web pages and in other appropriate formats for printing or other forms of electronic distribution.

c) **FAOSIS** which covers very specialised information systems. The Global Information and Early Warning System on Food and Agriculture (GIEWS), the Domestic Animal Diversity Information System (DAD-IS), the FAO Emergency Prevention System (EMPRES).

The following figure shows one of the pages of the FAOSTAT system that shows the result of a user search and the home page of the GIEWS (Global Information and Early Warning System) system.

Figure 2.6. FAOStat and Giews.



The principal aims behind the creation of WAICENT were to:

a) Increase the extent of information coverage handled by FAO;

b) Improve and streamline in-house data management;

c) Strengthen and simplify the flow information to and from the Member countries;

d) Reduce processing costs in all phases of receiving, treating and disseminating information;

e) Reach FAO's target audiences more effectively and at less cost.

Having recognized information and knowledge management as one of the five key strategies to achieve the goals of the World Food Summit, FAO reinforced the WAICENT as a corporate framework for agricultural information management and dissemination.

FAO is faced with increasing demands to prepare, manage and disseminate the information that it produces to the widest possible audiences, in the most efficient manner, utilising the latest in technologies, and at less cost.

WAICENT is a good example of how information dissemination activities can be integrated across departments and divisions, with reciprocal advantages allowing for greater efficiency and overall lower costs for the Organization. It provides the corporate tools for electronic processing and dissemination, making information equally available to all interested people.

Individuals, institutions, organizations and governments all over the world may access the WAICENT centralized database through the FAO home-page. Each department in FAO has presented its wealth of information sources independently; conformity only lies in the search mechanism. By providing exhaustive online information through the World Wide Web, along with complimentary services on CD-ROM, diskette and in print, FAO ensures that countries which face emergency situations will be alerted fully and ahead of time and are now able to have real-time contact with experts and immediate relief programmes.

Appendix I. Interview to Mr. Enrique Yeves

The interview reported below was conducted in October 2013 at FAO headquarters in Rome. Mr Enrique Yeves is the Chief of the FAO office for Communication, Partnerships and Advocacy. His position has made him the most appropriate person to answer questions about the subject of this work. The interview resulted in a confirmation of what has been reported in the article and a further explanation of the meaning of "dissemination" in the FAO world as well as a clear elucidation of the measures applied to control the validity and accuracy of the reports produced.

I would like to take this opportunity to give my sincere thanks to Mr Yeves and his staff for their kind availability and collaboration.

Figure 2.7.

Box. 2.1.

Question: FAO produces many scientific reports which are then distributed on paper and/or online. What is the meaning of «dissemination policy» for FAO?

Answer: FAO's overall distribution approach includes both a marketing and dissemination component, as both contribute to the eventual success of FAO's distribution of knowledge products and expertise.

Marketing: FAO maintains a corporate approach to ensure individual products and the publishing programmer as a whole are promoted in a coherent, high-impact manner. The Office for Corporate Communication (OCC), and specifically its Publications Group, supports marketing efforts of authoring teams and manages corporate-level initiatives with the aim of reaching all potential audiences. Importance is given to collaboration with institutional and commercial publishing partners and participation in industry events. To develop content and products that convey relevant information in the most suitable format for access by intended audiences, FAO places emphasis on audience engagement through needs assessments and customized marketing and monitoring activities for individual information products. Authoring teams exploit channels such as technical networks,

partnerships and specialized conferences to conduct audience research and promote their own information products. OCC combines stakeholder analyses, audience profiling and usage reporting to inform corporate-level monitoring and evaluation. Strong synergy between FAO headquarters and the Organization's decentralized offices, including systematic communication with FAO Representatives, supports outreach and facilitates feedback on usage and demand for products.

Dissemination: dissemination of FAO's information products is consistent with the objectives of maximizing access and impact, while respecting the need for efficiency through the adoption of appropriate production and delivery channels. Online delivery is prioritized, while selective distribution of products available in print and other physical formats is carried out where necessary to guarantee access by primary target audiences. There are three key ways dissemination is carried out:

Free official distribution: FAO's official distribution system currently provides for designated recipients in member countries, including FAO Depository Libraries, to receive one copy of major print products (generally products assigned an International Standard Book Number) free of charge. More limited distribution may be applied to region- or country-specific products. To achieve a more targeted and cost-effective official distribution system, a demand-driven approach is utilized, both in terms of product selection and mode of delivery. An e-mail alert system, together with a specific twitter account for FAO Publications, announcing newly released products and providing links for download by officially designated recipients will eventually replace the supply-driven delivery of all eligible products to official distribution lists. If required, recipients may request a print copy, if available.

Free targeted distribution: under this option, authoring teams provide a list of recipients (excluding official distribution recipients) selected to receive the product free of charge. E-mail announcements of new releases are utilized for targeted distribution, and are be planned in consultation with OCC to ensure consistency and avoid duplication.

Sales: selected FAO information products are made available for sale through a global network of distributors and sales agents. All sales of FAO products are managed by OCC through the Information Product Revolving Fund (IPRF), which selects products and sets pricing. Regular sales reports are made available to FAO departments and decentralized offices to support monitoring and evaluation of information products.

Question: Does FAO use specific rules to ensure the dissemination of its reports? Does it use any verification ex-post mechanism?

Answer: FAO monitors the dissemination of its publications in several ways: Authoring units within the Organization monitor products and record results against the indicators set at the planning stage; OCC monitors products and records results from marketing and corporate communication initiatives, licensing activities, permissions and sales reports; Authoring units, with support from OCC, evaluate products after an appropriate time lapse determined by content category, audience and type of indicator.

Question: Could you give us any example of FAO best-practice in the preparation, documentation and verification of documents and policies dissemination?

Answer: FAO's flagship publications are global reports that present FAO's official position, or information resulting from its global perspective, on a specific sector related to priority programmer or thematic areas. Flagship products are corporate products that are scheduled for periodic release and serve as major advocacy tools for the Organization. They are attributed to and cited in the name of the Organization, and forewords or similar statements are signed by the Director-General. Flagship products are conceived and presented as the most important among related products in a given programmer or thematic area. Flagship products are subject to periodic corporate evaluations to ascertain their continuing relevance and impact.

The dissemination of flagship publications is handled in a coordinated fashion throughout different parts of the communication team in the Organization. FAO's technical departments inform their own technical networks and external stakeholders of the upcoming publication and its main contents. They also hold important briefings with FAO's decentralized offices on the main messages related to the upcoming publication.

Once the official launch day is established for any given publication, media coverage is handled by organizing press conferences, disseminating press releases, and coordinating interviews with FAO's technical experts worldwide. FAO also uses social media such as Facebook and Twitter to spread information about these flagship publications.

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CHAPTER 3.

Pelagos, Sea Communication

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1. Introduction

MAR – the Marine Activities and Research Association – was created as an association to combine professionals from different disciplines in order to channel their efforts into investing in promotion of the elements making up the concept of "Sea Heritage" – the collection of natural, scientific, cultural and social elements which, over the centuries, have developed along the Mediterranean coast thanks to the interaction between man and the marine ecosystem. After many years' work, we felt the need to verify and validate our work and progress by further specialising in our activities to include an increasingly less localised and more European scenario. The current problem in communication about the sea is that there is no holistic and integrated approach towards Sea Heritage, but rather many small communication/production efforts, each corresponding to a small use segment of the sector. This leads to a lack of perception and dissemination of projects, products and services, that often influence unfortunately only a privileged few people in the know. A qualitative breakthrough will occur only when it is possible to work at a national and European network level on integrated communications efforts which are also able to make direct use of the sector's databases.

2. Ostia: Rome's seafront

2.1. The unresolved relationship between the Italian capital and its seafront

In the 19th century, the area currently covered by the Ostia district of Rome was merely an area of salt flats, abandoned to its own devices and infested by malaria and brigands. The same was true for almost all of the Papal States' Tyrrhenian coast, with marshland extending from Terracina to Piombino. It became clear to Italy's governing class that reclamation of the land around the new capital of the Kingdom of Italy was necessary, convinced as they were that this unhealthy area surrounding it would be a negative influence on the economic development not only of the city, but also of the wider kingdom. Considering that the ideal option of raising the land level would have taken an estimated 50 years with the technology available at the time, the alternative of creating a drainage system to channel away the water was chosen. In 1884, the *Braccianti Ravennati* labourers installed themselves in Ostia Antica, and the work began. These people were landless labourers who brought their whole families with them; they had been left without work by the crisis of the paddy fields which had struck the Ravenna area, but as leaders in their field, they began to organise themselves into associations. *L'Associazione Generale Operai Braccianti del Comune di Ravenna* (Town of Ravenna General Association of Labourers) was the first cooperative

in Italian history, applying for and winning the subcontract for the reclamation works. In 1884, financing was also obtained from the Depretis government to start the works, including railway concessions for the transfer of the families and their belongings. Among the economic and social tensions of that period, the commencement of the reclamation works could be considered a Keynesian project ahead of its time, and enjoyed great success: the initial 303 members of the co-operative had become 2547 by August 1885. The work, which had been estimated at four years, ended up taking seven, and was also characterised by great difficulties and negative events. Nevertheless, both the new united Italy and the labourers were eventually successful. As a matter of fact, in the years immediately following the reclamation, consideration was given to a railway linking the Kingdom's capital with its seaside; however, none of the projects proposed was approved by the authorities, who were reluctant to finance a connection with Ostia, which was at the time little more than an uninhabited hamlet.

The first settlement following the reclamation was, indeed, the *Villaggio dei Pescatori* (Fishermen's Village), so called because it was inhabited only by a few Neapolitan fishermen who settled down there, building wooden houses on the sands. It was only in 1915 that the municipality approved a project proposed by the engineer Paolo Orlando; however, this was immediately placed on hold, with Italy becoming involved in the Great War. The work restarted in 1917, using around 500 Austrian war prisoners to provide the labour. The works came to an end in 1924, with the inauguration of the line connecting Rome to Porta San Paolo and Ostia Antica. The railway led not only to the renaissance but also to the expansion of the Roman coast, and was initially used above all by Romans to reach the seaside. During the Second World War, the Rome-Lido railway was seriously damaged by the retreating German forces, aiming to prevent the Allies from gaining quick access to Rome. With the war over, the railway line was rebuilt, taking back its role as a bridge between Rome and its seaside. Though, consolidating a public transport system capable of efficiently connecting Rome with its coast did not mean, on the one hand, managing a synergistic relationship involving social and economic development, able to increase the value of the capital through its marine resources, or to integrate the coastal economy with the development plans of the eternal city, on the other. It was this type of approach, or rather this structural and planning deficiency, which would, unfortunately, accompany the history of Ostia and the Roman coastline right up to the present day. The area therefore took on the characteristic of a district or even suburb of Rome, playing a marginal and improvised role in the social and urban planning processes which characterised the capital's growth.

2.2. The dormitory town of the 1970s and the phantom beach

The 1950s and 60s marked a period of significant growth for Ostia. The area expanded, becoming one of the most populous districts of the Italian capital. Ostia turned into a holiday spot for Romans wishing to escape to the seaside. It was precisely this expansion which determined the birth of the westerly quarter, known as Nuova Ostia, which would become the western edge of Rome and echo the problem of marginalisation. After around twenty years of spontaneous, but nevertheless profitable development for the small coastal economy, which had become a major commuter tourist destination and the location of various social events, Ostia began to suffer from its geographical and conceptual isolation from Rome, which had grown during the uncontrolled demographic explosion of the 1970s and 80s. This expansion physically reduced the space between the Rome Lido and its main nucleus. However, the addition of small settlements encompassing various existing villages accentuated some imbalances and highlighted various environmental, economic and social issues connected with management of the coastline: from coastal erosion, through the degradation ensuing from the lack of investment to redevelop the bathing facilities, to the growing level of water pollution due to the lack of purification plants and the increasing level of urbanisation (often due to unauthorised construction).

In the meantime, the only attention paid by politicians to Ostia was in housing tens of thousands of homeless and destitute whom Rome no longer wanted to deal with – in the space of just a few years, the equivalent of a third of the area's inhabitants arrived from the most depressed areas of the outskirts of Rome, decisively changing the town's fortunes in social, economic and town-planning terms. The isolation of Ostia, that was for years the symbol of the unresolved problem of Rome with its seaside, was evidenced by the absence, or the small number and irregularity through the 1970s, of combined studies of the ancient and modern history of the Roman coastline. The physical evolution of the area and its natural qualities, ancient and modern human settlements, naval and port facilities, the drainage and reclamation, architecture and town planning, aimed at reconstructing the physical evolution and historical/anthropological identity of the Roman coast. These social problems spread, creating a period of conflict which caused anger and frustration among the locals, those residents with one, two or even more generations of history in the area – passionate about their land, and aiming to find the economic resources to live through seasonal or even permanent entrepreneurial initiatives. Two referenda were even held, ten years apart (1987 and 1997), attempting to create an autonomous coastal municipality. Rome initially left them to it, but then started to get worried as it discovered that the area had

become the centre of operations for Mafia-style clans – a breeding ground for organised crime. The problem became serious, with Ostia's problems having significant repercussions on the Capital, no longer confined to a local issue. Another serious problem for Rome came with the separation of Fiumicino - the historic fishermen's port and another mistreated district of Rome – in 1987 it obtained independence from the city following a referendum and began to grow, finding its strengths in the rural population and maritime operations. This separation also led to the loss of Fregene and its upmarket beaches, which had been systematically protected over time compared to the Ostia coast as it fell within the jurisdiction of the new municipality and also risked leading to a loss of strategic control of Fiumicino international airport and its service area. These last events essentially represented a situation of degradation and intolerance that the supervening distance of the administration could not handle.

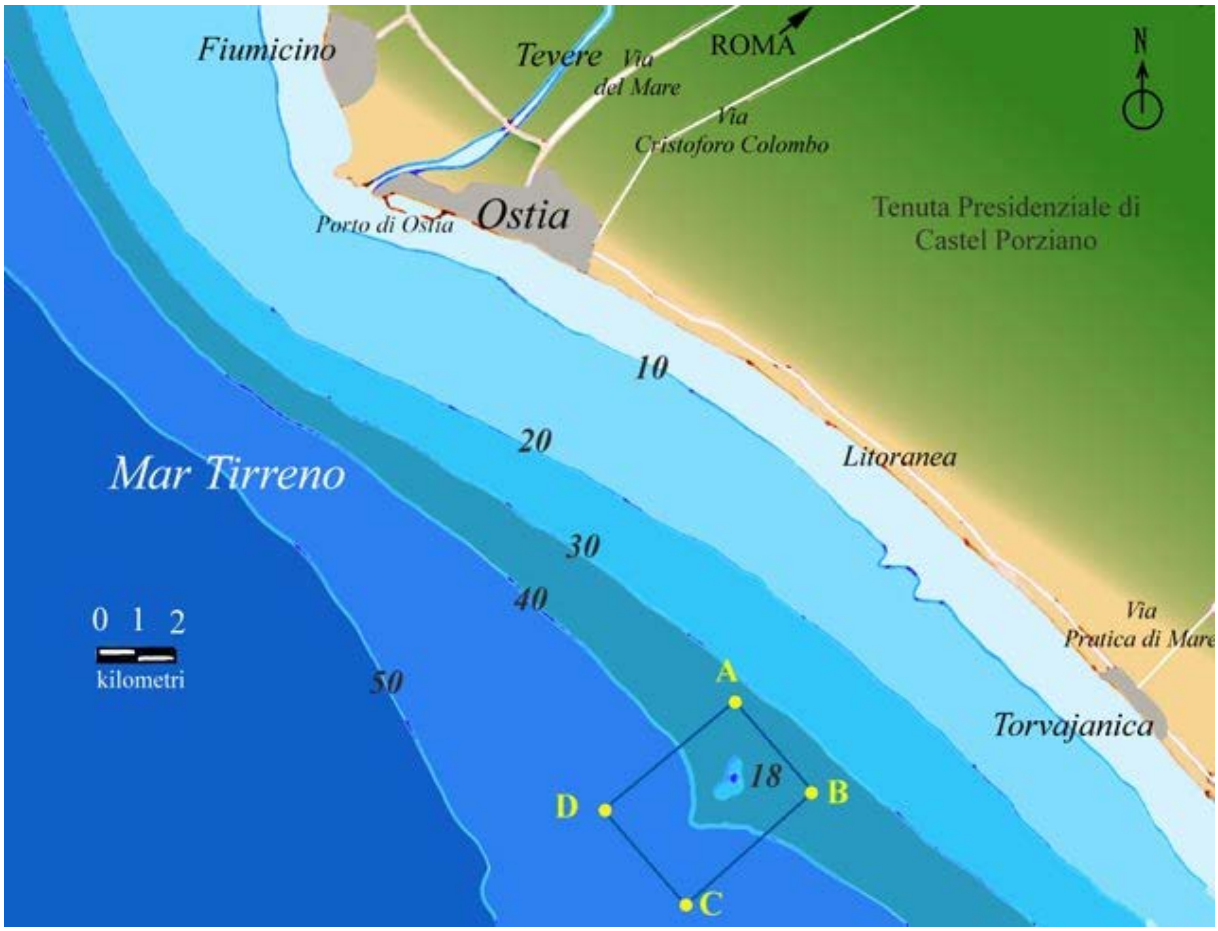
2.3. The first initiatives to re-launch the Port of Rome

Between the 1970s and 1990s, Ostia suffered from this social and cultural distance from Rome, but after a serious slump, it managed to resurface, playing a connecting role between the capital and the sea, thanks to a series of measures aimed at reclaiming and managing some portions of the area, as a first step towards a new environmental, cultural and social plan for the Roman coast. In 1985 measures were enacted – repeated in 1999 and between 2001 and 2003 – to protect the coast through a system of *supporting groynes* to the east and west, and via beach nourishment with sand taken from deep water mines. In 1988, the City of Rome and the ACEA water company conducted the upgrading and enlargement of the purification plants on the left bank of the Tiber at around two kilometres from its mouth, in order to supply the settlements on the Roman coast such as Ostia and Isola Sacra, as well as further inland such as Acilia, Infernetto, Dragona and other surrounding areas, as far as the municipality of Fiumicino. The works began in 1988, and by October 1990 the first of the three biological lines was placed into operation, able to completely compensate for the shortcomings of the old combined systems, and to treat the whole of the incoming flow according to legal requirements. A central year in the development programmes for Ostia and the Roman coast was 1998, thanks to the construction of the new Tourist Port, which gave rise to the redevelopment of the whole western seafront and a large part of the ex-seadrome - the most depressed area from a social and urban point of view. After being completely forgotten, Ostia was getting noticed again, and with it the Tiber and its ports. As a matter of fact, with the birth of modern Ostia, Paolo Orlando planned the construction of a new port which would

reconnect the Rome to its coast by river, as well. His dream was to see Rome connected to the sea via two ports, one at the mouth of the Tiber, the other at the level of the Basilica of St Paul or the Gas Holder, making the river navigable to small coasting vessels. His project was partially realised nearly eighty years later, in 1998, with the construction of Rome's tourist port in Ostia on the left bank of the Tiber, in Roman architectural style. This port can handle up to a thousand boats, with eighty shops, two bars, various restaurants, a bank, a yacht club, the water police headquarters and a supervised car park for up to two thousand vehicles. During the summer, the port is one of the stops on the charter circuit, which takes in Sardinia's Costa Smeralda, and the islands of Capri and Elba, as well as Ostia. Rebuilt very close to the Roman site, in some sections it recovers the historical structure. The impetus given by the birth of the new port generated a series of urban, archaeological and landscape development initiatives beginning in 1999. These include the repurposing of the former Meccanica Romana industrial area, housing the *Città del Cinema*, development of the Ostia Antica archaeological dig, the creation of the coastal nature reserve – containing a WWF sanctuary surrounding the port area and a LIPU (Italian bird protection league) protected area, contributing to the environmental safeguarding of the area – as well as the repurposing of the ex Vittorio Emanuele III seaside holiday camp, containing a youth hostel and the Elsa Morante library.

Finally, in 2000, the *Secche di Tor Paterno* marine protected area was set up - the only one in Italy to be completely underwater, not including any sections of coast. It is composed of a rocky formation covered in animal organisms and vegetation which have changed its form over the centuries by digging out or building their homes (fig.3.1). The highly variable cloudiness of the waters is due to the sudden variations in currents caused by its vicinity to the Tiber delta. Rome is thus now the only European capital which can boast a Marine Protected Area inside its administrative borders, but most Romans do not, to this day, know of it.

Figure 3.1. Ostia, Secche di Tor Paterno marine protected area.



3. The Origins of the Association

The rebirth of Ostia, has been set in motion by the public works carried out by the local administrations to enhance the environmental and cultural heritage restored to the citizens, and ready to include economic and entrepreneurial development to meet the new requirements of the current international tourist market, also thank to the birth of new associations committed to adding value to and disseminating the environmental, artistic and cultural heritage of the Roman coastal area. Alongside, the traditional voluntary sector associations working in the Rome coastal area, including Lega Navale, Federazione Italiana Vela, Italia Nostra and Legambiente, and side by side with the national start-up of the Marevivo association, MAR – Associazione per le Attività Marine di Ricerca, the marine activities research association, was created. This association aims to develop a collective conscience in order to enhance and add maximum value to the Rome coastal area, paying close attention to and researching how to insert the Rome area in the collaboration and development processes which are already operational in the wider European/Mediterranean context.

3.1. A new association model

MAR – Associazione per le Attività Marine (the marine activities and research association) – was formed in 1991 as an innovative association concept to combine professionals from different disciplines. It immediately concentrated on and invested in three fundamental elements: communication, development and promotion of the elements making up the concept of "Sea Heritage" – the collection of natural, scientific, cultural and social elements which, over the centuries, have developed along the Mediterranean coast thanks to the interaction between man and the marine ecosystem. The interdisciplinary and multisectorial nature of the training and experiences of MAR's founders indeed range from cultural and sustainable tourism to region marketing, from marine biology to geophysics, from journalism to professional communication, from audiovisual media to documentary photography, and from sailing and boating to diving. The proficiency in organising these different professional capacities is what lies behind MAR's ability to capture the area's requirements and read the potential in them, each time offering technical support and building summaries in order to create planning and development projects for the local sea heritage, implemented by local institutions and administrations. A holistic vision of maritime heritage was behind a revitalisation strategy which immediately aimed at producing virtuous effects on the area which can actually be measured, above all in terms of their ability to produce synergies between the fabric of the coastal area and the world of industry, scientific research and society at large. The actual development of this approach has been consolidated and has often drawn new stimuli for its proactive drive from EU indications and policies. Repositioning the Latium coast at a national and international level, for MAR, has always meant placing the local development programmes within EC directives, getting back to the idea, after years of excessive distraction, that it is no longer possible to create, much less launch, environmental, sporting and tourist initiatives which do not fit into an overall economic and productive revitalisation plan.

3.2. Sport, Culture and the Environment, the sentinels of the sea

Restoring availability for citizens of large shore areas ,thanks to beach nourishment and repurposing of the areas occupied by the first bathing beaches, allowed demand to grow for watersports in the area. Ostia, and the MAR association, have succeeded in satisfying that demand by offering services consistent with tourists' desires, no longer just to enjoy the beauty of the landscape, monuments and archaeological treasures, but also to dedicate time to their physical and mental well-being. From sailing to pleasure boating, surfing to sky-surfing, right

the way through to beach volleyball, tennis and soccer, sports have always been treated by MAR not just as a tool for growth and social integration, but also as a tool which can raise awareness of the area and get the younger generation involved in cultural and environmental issues.

This manner of thinking about and offering sport in relation to the sea has allowed the association to implement a series of activities which combine elements to enhance environmental sensitivity alongside with the pure entertainment value of the sport. They also provide an introduction to the artistic, cultural and architectural heritage, making an innovative reading of the marine ecosystem possible, and accessible. Linking knowledge to observation and to a concise, indirect representation, including the use of technology (initially analogue, then digital) for both photographic and audiovisual shooting that was an insight which MAR followed up with an initiative entitled *Un Passaporto per il Mare* (a passport to the sea). This offered youngsters an experience-based path of discovery and sensitisation towards the sea which immediately saw the involvement of many local schools, creating *citizens of the sea* who would then go on to amplify their knowledge of the Roman coastline with the main environmental education programmes at an EC and international level.

3.3. Relationships with Schools and Universities

The popular vocation of the MAR association found Universities and the research world to be a natural partner more than an obligatory reference, allowing us to follow up on an intuition which, in time, would emerge as a need which can no longer be put off: filling the gaps which for many years have kept the scientific community and the world of professional communications sealed off, in order to create a link to an essential and previously excluded third party – public opinion. MAR has chosen to build a link between marine scientific research, students in compulsory education and professional communication, setting up a path combining the methodological rigour of the academic world, young people's predisposition for direct/visual learning, and the summary skills required for journalistic communication. MAR wishes to offer its interlocutors a system of communicating vessels, or rather an infrastructure which is able to correct a path (thanks to the direct countercheck the interaction and connectivity which multimedia communications make possible) which would otherwise have suffered the encumbrances and rigidity which for too long penalised not just the scientific community, but the world of research first and foremost. The need for scientific dissemination thus led to the creation of a virtuous circle between communicators, researchers and students, easily capturing the attention of both public opinion and institutions, producing direct effects which can be measured at a local level. The desire to make the sea the driving force behind the development of the planning and projects

area, including from a tourism and economic point of view, made it immediately clear that it was necessary to firstly build new knowledge and awareness of the way the concept of Sea Heritage is structured. Secondly, the need to stimulate demand for cultural and professional training able to seize the opportunities the *blue economy* offers was also clear. This is above all in terms of the meaning of the concept which is already supported by the European Community with some financing channels outlined in the Seventh Framework Programme and in light of the objectives of the *Horizon 2020* programme.

In this sense, the MAR Association has always had a key partner in students – in compulsory education and university – and their teachers, who have had the sensitivity necessary to grasp the meaning of an educational more than training proposal, able to support traditional teaching by combining direct experience with the use of new technologies and exploiting the immediacy and evocativeness of audiovisual language and visual communications. MAR has undertaken several initiatives: a steady monitoring of the water and visits to the purifiers on the Tiber in collaboration with the ACEA water company, an oceanographic cruise on "the Bannock" in collaboration with the port authorities, and the photographic trips on along the Tiber and in Ostia and Fiumicino, co-ordinated by internationally famous documentary makers, photographers and journalist, and developed in partnership then formed with the Festival Mondial de l'Image Sous Marine in Antibes, France, through a twinning which opened up important prospects and relationships for the whole Roman coast.

4. Towards internationalisation

The implementation of a series of consistent activities, but subject to the discontinuities, which too often characterise the relationship between the world of independent associations and local and national institutions or government, helped grow the experience and credibility of MAR in terms of dissemination of local Sea Heritage; but did not exhaust the drive which the European network – in continual expansion – was immediately able to guarantee to development projects linked to sustainable use of ocean resources. A dense yet heterogeneous calendar of events has been carried out during the school year, to connect the capital and its coast in a structured container of international projects, and the best the local area can offer. This container represents a set appointment for its inhabitants, was a natural evolution of the work of disseminating a *new sea culture* behind the creation and development of the MAR association's activities.

4.1. Ostia Azzurra: the first major collective event dedicated to the sea

Ostia, with its new tourist port, new beaches, seafront and wharf given back to its inhabitants represented the ideal location to hold the first event dedicated to sea culture: *Ostia Azzurra* (fig.3.2). This was an event that was able to involve young people and entire families through art, shows, sport and entertainment, while at the same time attracting the attention of local stakeholders, institutions and partners. It could be seen as embryonic for the different cultural and economic development plans for Rome's sea. *Ostia Azzurra*, indeed, was the incubator for a new format which combined information through workshops, seminars and meetings with sport-, art- and performance-based entertainment. Ostia Lido and the waters of the Roman coast in that sense provided Ostia Azzurra with the natural scenario for an event which has developed its content over the years while being one of the main factors for the economic and cultural rebirth of the Roman seaside.

Figure 3.2. Ostia Azzurra.

The project includes the tourism industry, Rome's new tourist port in Ostia, facilities and restaurants (fig.3.3 and fig.3.4), schools and those in the cultural sector, as the Elsa Morante library, institutions, municipality, Province and Region, workers, il Borghetto dei Pescatori, the fishermen's village (fig.3.5), and artists, as well as the audience of enthusiasts and families, in what to all intents and purposes represented *a Renaissance of the sea*, made up of science, art and sport.

Figure 3.3. Rome's new tourist port in Ostia.

Figure 3.4. Rome's new tourist port in Ostia.

Figure 3.5. the fishermen's village.

4.2. From the Collaboration with Antibes to the Pelagos Festival

Audiovisual media and image-based communication are the favoured language for effective cultural communication and social sensitisation, by considering that the need to increase the flexibility of the interdisciplinary connections make it impossible to geographically delimit the Sea Heritage debate in the academic/scientific fields. Documentaries, movies and pictures offer an immediate perception of the topics, issues and characteristics uniting the seas and oceans of the world (for example the geophysical, hydrogeological and microbiological discoveries which have recently allowed us to talk about the Mediterranean Ocean). The international relations which the MAR association has established in multiple contexts, including via the Festival Internazionale dell'Immagine Sottomarina – ONLUS (non-profit organisation engaged in collecting underwater and marine documentaries and *reportage* on an international level), workshops, *b2b* events and international festivals, along with the twinning with the Festival Mondial de l'Image Sous Marine, made it possible, in 1999, to put on the first international sea festival – Festival Internazionale del Mare – Pelagos. The contest, which right from the beginning placed the photo section alongside the audiovisual section, had the insight of initially addressing international *auteurs* in order to offer the public the highest quality works and products and to stimulate the growth, of the passion for underwater photography and video, which over the years

has produced excellent results which have gained recognition in Italy and abroad. Since its inception in 1999 a total of 15 editions of *Festival Internazionale del Mare - Pelagos* have been held, with over 4,500 contestants represented from over 50 countries all around the world. It has exhibited over 3,500 photos and around 1,000 audiovisual productions from internationally famous auteurs, documentary makers and artists, put on international meetings and events in the sector for the enjoyment of the public, and hosted out of competition some international productions such as *The Cove*, which, just a few months after its Italian première at the festival, collected an Oscar for best documentary at the Academy Awards in Los Angeles (fig.3.6). Behind the creation of the International Sea Festival was the desire to create a synergy between the intrinsic value of the collected and catalogued works and the possible uses of the audiovisual elements not only in study, research and training, but also in cultural marketing, promotion and distribution. The user base and institutional context in which it is held have allowed the festival to become a hub for initiatives aimed at internationalising Italian audiovisual products, promoting SMEs in the Lazio region and creating international partnerships, such as with the participation in the Abu Dhabi Film Scouting in 2009.

Figure 3.6. the Cove poster.

4.3. From audiovisual productions to Pelagos TV

As digital communication reaches full maturity, *Pelagos* has taken on the information challenge posed by the web, launching the first Web TV channel dedicated to sea heritage. Pelagos TV, the natural online container for the topics and content covered by the International Sea Festival, created immediate link with the website (www.pelagosarea.eu). Its subsequent evolutions on the social networks formed a synopsis for further investigation of the many disciplines and applications which the various public and private partners making up the *Pelagos* network express in the scientific, cultural, economic, social, historical and artistic fields. *Pelagos TV*, initially a dissemination tool for the *Pelagos* campaign, soon became a platform for original content from various genres, from *Tg del Mare* sea news, through *edutainment* with the *For Friends* co-production aimed at viewers from 10 to 14 years of age and one of the first experiments in sea-based reality TV, right up to interviews and *reportage* on the main events in the sector, from the Genoa Boat Show to BIG BLU at the Boat and Sea Expo in Rome.

4.4. Pelagos becomes a *Campaign*

The *Ostia Azzurra* event has provided Mediterranean Sea Heritage's communications and culture a place on the agenda of local government and school boards, as well as a prominent place in public debate, with: **i)** increasing attention from the media; **ii)** constant growth in the network's stakeholders and partners, and; **iii)** ever-increasing participation from the public, segmented by age, social rank and private and professional interests. However, in 1999, a turning point was reached, and the yearly event turned into a dissemination format which is unique in Italy, taking on the characteristics of a fully-fledged institutional communications campaign on Sea Heritage, with the creation of Pelagos Sea Heritage. The campaign took shape as a flexible container, both on a regional and operational level, and as an incubator for public and private projects and events, to meet the need to combine regional promotion, environmental protection, culture and education in a wider vision. The aim is to consolidate and develop tangible and intangible Sea Heritage as a strategic resource for Italy's development and international standing both from a scientific and tourist standpoint. All this by adapting dissemination methods and strategies to the new technological panorama, which was discernible at the beginning of the millennium, and has now fully come to pass.

5. From Travelling Initiatives to BIG BLU

In 2007 the *Pelagos Sea Heritage* campaign found its natural place in its partnership with the FIERA ROMA exhibition centre in Rome. The organisation put on an exhibition inside the Boat and Sea Expo Roma BIG BLU project, showcasing the best public and private companies and projects at a national and international level for the promotion and dissemination of Mediterranean Sea Heritage. The active presence of industrial, commercial, cultural and tourism players contributed to the creation of the *Pelagos* Sea Heritage cultural area, which made BIG BLU the only national nautical event to pay attention to cultural dissemination and environmental protection and social development projects linked with the sea. The appeal of the *Pelagos* format contributed, on the one hand, to an increased number of visitors, and on the other to sensitisation of public opinion to the strategic importance of the sea as a resource through various forms of communication.

Figure 3.7. Big Blue (2013 edition).

The *Pelagos* format focuses on various types of visitors – communication professionals, families, young people and sea enthusiasts – and is also able to meet the interest of the primary boat and sea expo target visitor. With the exhibition, the *Pelagos* communications campaign became a cultural event and benchmark for EU and international programmes, until in 2010 it

integrated the contents of the Italian Ministry of Agriculture, Fisheries and Food's 2011 *Sistema Mare* campaign. This was its 2012 *Obiettivo Mare* campaign, with a schedule of interactive and multimedia activities, film screenings, themed exhibitions on fishing, conferences, seminars, round tables, educational and didactic courses on the sea and its economy, workshops and tasting sessions.

Figure 3.8. Big Blu (2013 Edition).

5.1. Pelagos Exhibition: a Multidisciplinary Platform

Over the six editions of Boat and Sea Expo Roma's BIG BLU event, *Pelagos* has progressively built up an ever-larger area, attracting increasing numbers of visitors by systematically organising its partners' operations to perfect a genuine cultural area dedicated to Sea Heritage (fig. 3.7; fig. 3.8; fig. 3.9; fig. 3.10) The exhibition has offered a display area to bring together a series of players and protagonists from institutions, civil society, the world of science, universities and research, in order to allow thorough scouting of Sea Heritage, combining multiple disciplinary approaches to encourage the exchange of knowledge and skills, publicising activities and initiatives and providing visibility to the best operators working to promote and protect our Sea Heritage. The exhibition space dedicated to cultural and economic players, representatives from institutions, communication professionals and artists is organised to allow *guided visits* and to showcase the topic of the sea from all angles.

Figure 3.9. Pelagos 2009.

The common thread holding the exhibition together is the dissemination of the scientific and cultural aspects of Sea Heritage, priming a schedule of activities aimed to develop all the aspects and topics linked to the sea across the different thematic areas on offer. A series of activities organised into a coherent schedule were developed to involve the family audience in different ways, offering them an event which is able to combine entertainment and culture thanks to a wide variety of stimuli and cues, all held together by the use of new technologies as a common medium. The event also has a design of the area enhancing and exploiting the richness and complexity of our Sea Heritage with models of marine environments, multi-use tanks, interactive installations and projections, multimedia rooms and a Web 2.0 infrastructure. The whole display area, and therefore the flow of information that the interaction between the visitors and the exhibitors determines, is managed via a communication plan which includes multimedia and interactive tools and devices arranged along the whole exhibition route, increasing visitor's participation. The result is a genuine virtual exhibition overlying the real one, thanks to interactive installations and a visual design path which combines physical and virtual spaces to build a cross-media experience.

Figure 3.10. PELAGOS TV.

5.2. Youth project: A Passport to the Sea

The multidisciplinary platform and various practical environments presented form the ideal framework to best express MAR's commitment to communicating with young people. Since 2007, the Association's communications commitment has been entrusted to the project Un Passaporto per il Mare (A Passport to the Sea). Un *Passaporto per il Mare* is aimed at middle and high schools, offering a training programme in which direct experience and the use of technology and new forms of communication offer new possibilities for learning about Sea Heritage (fig.3. 11 and fig. 3.12). The aim is to spread knowledge to the younger generation, inside and outside of school, about the coast and sea bed and about cultures which have advanced thanks to the water, using this knowledge to show them how to design sustainable development and economic growth models which respect and correctly use a resource which is still to be fully explored. The history of the project includes years that were spent building a day by day relationship with the area, the schools and institutions, with the aim of creating a shared objective. Over the years this has come to involve not just the Rome coastline, but eventually the whole of the Latium region and then Sicily and the Veneto region. The topics covered – *ranging from the discovery and development of the*

region's sea heritage, through biodiversity and its protection, sustainable development and eco-tourism, to energy from the sea – were presented to the students in the institutes, ranging from 11 to 18 years of age, via a course consisting of three fundamental components.

Informal lessons, structured like talk shows, held in schools by marine biologists and communications experts who found the complement necessary to implement the experience-based path in the event *Pelagos - Sea Heritage Exhibition*, through showing documentaries and other films. Tactile workshops, cognitive tests and simulations, quizzes, interaction and entertainment create a training course which concludes and is summarised by the visual reworking of the *BIG BLU Project* creative contest. Un *Passaporto per il Mare* also represents an opportunity to obtain the *Citizen of the Ocean Passport*, a real document symbolic of the initiative promoted by UNESCO - sponsored by the EU and UNEP, which allows the young people involved to keep track of the marine environmental protection activities undertaken up to becoming part of the *Ocean Ambassadors' international diplomatic community*. Putting researchers, institutional representatives, artists, communication professionals and middle- and high-school students from all over Italy around the same table would have had little sense, representing yet another empty stylistic exercise, something we strongly wished to avoid. If that had been the case, *Un Passaporto per il Mare* would not have become an event which is now an integral part of young people's education in knowledge, awareness and proactiveness in relation to the sea. This event has increased in size each year, creating dialogue and growth between marine biologists, artists, students, local administrators, directors, photographers and business people in a continuous and prolific exchange. The model has demonstrated how it is possible to bring different ages, sensitivities and goals together by sharing experiences and languages. The initiative has also represented ground favouring and institutionalising MAR's meeting and collaboration with the European SECOA project which, among the various publicity and dissemination initiatives in place, aimed to interact with the network of young students involved with *Un Passaporto per il Mare*, stimulating them with the study topics and their direct effects on the area. A dynamic exercise of certain interest which *SECOA* carried forward with great care, and which it also included in the programme for one of the project's most representative events, the closing conference in Rome.

Figure 3.11. Youth project: a passport to the sea.

Figure 3.12. Youth project: a passport to the sea.

5.3. Euromed and International Conference Organisation

Setting an event like Ostia Azzurra certainly contributed to a revival of public debate on the sea as a resource. Moving on to the *Pelagos* institutional communications campaign, and then to the nationally important event *Pelagos Sea Heritage Exhibition*, facilitated the development and promotion of the best companies and projects working for Mediterranean Sea Heritage in Italy. However, the *question of the sea* has always required other coasts to be included and involvement of the EC and other countries sharing the Mediterranean basin. In this sense, the international perspective carried forward by the *Pelagos* campaign and the desire to persist in the connections between scientific research, communications and sustainable economic development, naturally led to the realisation of the *Second International Euro-Mediterranean Conference - Euromed 2* dedicated to the relationship between the scientific community and players in economics, the voluntary sector and representatives from civil society. It was aimed at getting the attention of decision makers and spurring governments into action to combine local and national policies in the wider context of the Mediterranean basin in order to agree with and follow up the directives that the EC has been producing for over a decade now in the areas of communication, sustainable tourism and transport concerning the Mediterranean's marine/maritime system. For the first time ever, an international scientific conference entirely dedicated to marine science and the major players in the world of research decided to dedicate an entire day to the topics of communication and dissemination. In this case,, MAR took on the challenge and the event, hosted in style by the city of Messina in Sicily, was a great success, paving the way for a series of activities linking the association to university consortia and research bodies. The international convention *Environment including Global Change*, held in Palermo in 2009, offered a further work and integration platform to MAR, which organised themed meetings, debates and off-air events, including mass use of the web and *Pelagos TV*, which by that time had proven itself to be an essential media partner from the world of marine and maritime science and culture.

6. The Rome Charter for Sea Heritage

The need to involve political decision-makers in a path which had already demonstrated it had found in Pelagos a form, that shared by the world of research, public opinion and communications professionals, led to the drafting of the *Carta di Roma per il Patrimonio Marittimo*, Rome charter for sea heritage (fig.3. 13). This policy document garnered the support of numerous institutions in support of the work of the public and private bodies which develop multidisciplinary initiatives, cultural programmes, popular science programmes and business initiatives connected with the sea heritage of the Latium coast. The MAR Association, leading a network that includes A.F.I.I.S. Onlus, Arsenale di Palermo dockyard and the Venice Marco Polo System G.E.I.E., in collaboration with the Italian Ministry of Cultural Heritage and Activities, as well as with the local government, wanted to put their experiences and individual projects into action by finding alliances in a common declaration of intent, in order to give the topic the global character which befits it. The document, signed in the initial phase by the promoters and national and local institutions which had been part of the project since its creation, was intended from its inception to find widespread support in Italy, European countries and the other countries bordering the sea, particularly the Mediterranean. The starting basis was a provocative Arthur C. Clarke quote: *"How inappropriate to call this planet Earth, when it is clearly Ocean?"*. This is the title of a recent European Commission document, the Green Paper, outlining the most important and innovative development process of the European continent. In the Green Paper is underlined the idea that is not possible to leave aside sea heritage policies dealing with all topics relating to the seas and oceans, promoting in-depth knowledge and planning interventions targeted at protecting marine ecosystems and the historical and cultural heritage linked to them. The success of these policies depends, to a large extent, on creating agreements and actions to be developed both horizontally and vertically in trans-regional contexts, which have maritime culture and the promotion of the local environmental, historical and traditional naval values as a common denominator.

Figure 3.13. Rome charter for sea heritage.

6.1. Culture, business and communications: birth of the Sea Heritage Best Communication Campaign Award and Sea Heritage Day

The conviction that knowledge, now more than ever, requires adequate support from modern communications technologies and techniques has led to the creation of an initiative which has built a bridge between industry, tourism, cultural promotion and professional communication. Created in 2010 from the principles of the The Rome Sea Heritage Charter, the Sea Heritage Best Communication Campaign Award – promoted by the largest Italian organisations and associations for professional and public communications like the Assocomunicazione, Comunicazione Italiana, Assorel and FERPI – represents international recognition for all those who have developed communications campaigns and projects for the development, promotion

and dissemination of sea heritage and water resources. The award was created as the occasion to monitor the progress of the communications strategies and techniques which public and private bodies, companies, professionals and associations have developed to spread information on scientific, cultural and artistic projects for the promotion of sea heritage. In the first three years of the initiative, more than 100 candidates participated in the award – national marine research programmes, European projects on the blue economy, coastal management, including the *SECOA* project, sea themed TV programmes and series, as well as major architectural restoration projects on ports, lighthouses and industrial archaeology, studies and historical research on seafaring traditions, underwater archaeology, the most important European maritime museums and numerous artistic offerings, such as paintings, sculptures, literature, dance, theatre and music. Gathering together institutional representatives and the elite from the worlds of academics, business and communications, not just from the sector, offered the specialists and large general audience, at BIG BLU, the opportunity to participate in themed international workshops on the current situation in local and global government policies for Sea Heritage. *Sea Heritage Day* has created a time for reflection around the competition in which the world of culture and scientific research meets the world of business and institutions to compare notes on possible synergies between the environment, culture and scientific research and on the *facilitator* role that communication can and must perform, to be able to make the qualitative leap from pure intent to full operation. *Sea Heritage Day* has offered a chance for bodies, people and groups of interest to put themselves on display, those who, at a national and international level, develop, favour or support market initiatives, cultural programmes, institutional campaigns and scientific research projects dedicated to marine and maritime resources.

6.2. Pelagos Prize

The welcome given to the *Sea Heritage Best Communication Campaign Award* by the press, , suggested in 2012 the inauguration of a special section for journalists, the *Pelagos Prize*. The participation of prestigious institutions and the main broadcasters, a strategic partnership with ANSA – the Italian national press agency – via the direct involvement of ANSA Mare, and the format created, with a final prize giving ceremony, represented the celebration of a working journey which summed up the value of everything put into action by the *Pelagos* campaign, including through the words and testimony of the most important communicators (journalists, popularisers, spokespersons) in Italy with a history of talking about the sea.

7. Context Analysis and Methodology: Outstanding Rome

Rome is the most important cultural centre in Italy. Between museums, monuments and archaeological areas, it counts 46 state cultural sites and a further 16 non state-controlled sites, a total of 200 places of cultural interest alongside 157 theatres, thousands of protected archaeological treasures, hundreds of libraries, historic parks and villas, as well as the whole city centre, which is a UNESCO world heritage site in its own right. Its scientific and technological research system is no less important, and at least on paper represents a truly extraordinary heritage. Rome has 132 research centres and 48 university departments, leading the country in number of graduates in technical/scientific fields, and taking second place after the Lombardy region in the number of people employed in innovation, with 167,000, or 16.2% of the national total. Finally, the audiovisual media represents another essential element in the eternal city's creative industry, founded on the ideas and economic use of intellectual property. This is a sector made up of both bespoke and industrial companies, which expresses itself through multimedia, cinema, TV and animated products, both traditional and digital. Of the 9,000 companies in this sector in Italy, 30% of them are in Latium and 25% are based in Rome itself, which also boasts the headquarters of the main Italian TV channels, as well as the historic Cinecittà, which hosts most Italian cinema and drama production. Over the last forty years, the cultural goods and services sector in Italy have seen significant renewal. In the 1970s and 80s, awareness of the great value associated with cultural heritage began to increase, and the 1980s saw the economic component of the value of that cultural heritage recognised. It was in this period, indeed, that has been seen a new legislative tendencies, with cultural assets being taken into consideration as economic assets as well, and beginning to be valued as the possible driving force behind a relaunch of the local development process. Moreover, the crisis of the traditional markets and the high tourism turnover at that time persuaded the national and international governments to review the role of culture, which was transformed from a simple asset of a nation into capital available to produce income and additional employment. Within this renewed vision, one idea started to take shape in order to activate local development processes supported by exploitation of the area's cultural resources: that it was necessary on the one hand to activate those production sectors which directly participate in the process of developing cultural assets, like R&D, restoration, chemicals, precision machining, IT, crafts, publishing, communications and multimedia.

On the other side it was necessary to integrate the development process with context of the area housing the artistic heritage, and therefore the transport system, the services which guarantee local accessibility and accommodation, and the quality of the social, architectural, urban and landscape environment. This means thinking from an integrated perspective in terms

of the cultural offering which is thereby not limited simply to the artistic asset, but is rather improved by the offering of services connected to the external area context. More specifically, it is a case of combining the development process of the cultural resource with a "network system". Each component that belongs to the network must be directly connected to the development process of the cultural assets while at the same time interfacing outside the network; the more integrated the network internally, and in turn the context area, the greater the economic impact generated will be. Noticeably, effective development, including economic development, of the city's cultural heritage is also feasible if able to organise a true "culture and cultural services industry". It is by thinking from this point of view that the development process for cultural assets can be transformed into a strategic factor for the city's economy. It is this integrated system which constitutes what is defined as a cultural industry founded on cultural assets. The integration process must also involve the local population, stimulating their sense of belonging and identity with the local artistic and cultural heritage. It is thus necessary to change the nature of the local community through greater involvement in protection and conservation activities.

8. The New Frontiers of Dissemination

After years in which the struggle to build up a sea system had some success, today new scenarios are opening up for the dissemination of the culture and science of the sea through communicative efforts which require a further creative and planning effort from associations like MAR, universities and research institutions, cultural and economic players and governments. The Sea Heritage is the field of application of popular communication for promotion of the responsible use and sustainable development, starting from the new possibilities for sharing and spreading knowledge and information, and to the creation of new professional capacities linked to the digital era, and of innovative regional marketing plans.This gives a glimpse of a path in which tools and approaches from different contexts, designed for apparently different ends, can be combined, such as open access, digital archives and quality marks.

8.1. Open Access

The requirements of the Seventh Framework Programme concerning communications and dissemination consist of: **i)** a *publishable summary*, that is an information sheet which provides information on the expected final outcomes and subsequent social implications; **ii)** a website containing the project description, the partners, the main information on the performance of the various activities, and; **iii)** a final report including a dissemination plan to provide visibility for the added value provided by the project itself at the EC level, as well as a list of all peer-reviewed

scientific publications. Communication in European projects responds to certain strategic objectives for increasing visibility of the project results, with three main consequences: **i)** greater awareness of the goals obtained in scientific excellence; **ii)** greater knowledge of the working opportunities created by introduction of the new technologies and the possibility to improve quality of life in other ways, and; **iii)** greater comprehension by political decision makers of the scientific results obtained, and of the fact that these can influence political and industrial planning. However, a significant problem concerns the fact that researchers involved in the projects often focus too much on the research, not dedicating sufficient time to the process of communicating its results – neglecting their audience in this manner is rather counter-productive. It is, on the contrary, necessary to involve the public, not just by presenting the results, but by telling the whole story of the project. To this end, the European Commission helps and supports project's participants in the process of disseminating their results, using tools (e.g. Cordis) which group the projects, dividing them into their respective sectors, or else journals and other publications produced internally by the Commission itself. It has also recently created the *Open Access* tool, an internet portal for publishing peer-reviewed articles and other important forms of publication (pre-print and congress proceedings), which users can take advantage of free of charge. The main goal of this type of tool is to ensure democratisation and therefore free and across-the-board access to information by any interested party; the Commission also wishes to incentivise similar initiatives at a national level. It also clarified that the costs of creating this kind of open access to scientific publishing are fully eligible if they are budgeted inside the initial project and fulfilled within the time-frame established together with the Commission. The possibility for a project team to use their local contacts, experience and members' skills is necessary to identify innovative results and research methods from other countries, map them out and make them available for all political, academic and business stakeholders. In order to fill the communications gap, training courses and online tutoring services are provided for in order to create a communications network with the target audience right from the beginning of the research project. The objectives and planning possibilities right from the beginning of industrial exploitation of research project outputs, in order to involve enterprises and increase the application of the studies performed, are closely linked to co-operation with communications experts to make use of different channels and techniques in order to tailor the message. From this point of view, the most recent trends show how it is essential for scientific researchers to rely on professionals who are full time dedicated to these kinds of activities. Activities such as quality management of contents for non-professional non-segmented audiences for whom it is necessary to completely change the lexis and register of the writing depending on the age group, audience contexts and cultural level of the intended readership. This could also mean constant adaptation

depending on the external economic conditions and sensitivity of the interlocutors in the case of policy makers. A series of easy and intuitive tools is coming from the scientific world for rapid updates on the products and innovative processes when the relevance of the initiatives and the degree of legitimisation interacting with the world of politics predominate, or finally, when the target are the SMEs and the aim is technical transfer.

8.2. Digital Archives

The availability of knowledge and information whit open access has made a requirement of scientific communication. More clearly, the case of technical transfer, finds in digital archives (the so called *new cultural assets*) one of the most intuitive examples of how systematic archiving and standardised information transfer protocols lie behind the necessary applications that communications professionals can use to increase the degree of availability of data and acquisition of scientific research results. A digital archive is, in short, a networked database for consulting original documents which gathers together and catalogues deeds, reports, photos, drawings, films, bills and publications in archives, documentation centres, companies, foundations and associations. Digital archives provide a way to promote the awareness and availability of knowledge heritage, develop and exploit it across the board and bring out connections and relationships between content, fed by collaboration between archives, enterprises, and cultural and training institutes who make materials available. These archives can be consulted both via traditional data query methods and by the search and exploration functions typical of the web, which can meet not only historic and didactic research needs, but also those of the wider public with different interests and skills. An archive built in this manner represents an incubator for projects, linking institutions, universities and the market for the collection and preservation of audiovisual and photographic productions. To this end, a marketing plan, based on a Sea Heritage digital archive, would be able to involve citizens, institutions and investors at different levels to create a virtuous circuit between the creation of new cultural heritage which can't just be economically sustainable, but also set up a centre of excellence for international communications, art, entertainment and cultural events and activities. It is possible to identify, some thematic areas and a series of activities which run transversely to those aimed at diversified targets, based on the use of collected and catalogued audiovisual material. The audiovisual element, in the form of documentaries and *reportage*, will therefore form the foundation for research and dissemination aimed both at professionals as well as an audience of families and young people. The activities will concern topics of surface and underwater flora and fauna biodiversity, examining in depth the effects that climate change is having on the ecosystem's

equilibrium, as well as of human activities which have developed in close relation to the environment, agriculture and fishing, from crafts to wine and gourmet food production. It will be possible for cultural, tangible and intangible production, from the local craftsman through to inventions and intellectual works, passing by popular and folkloric traditions, to be at the centre of a path combining economics and entertainment, in order to create an innovative product which is able to meet not only market demand, but also involve both research and institutional projects in routes for accessing EU financing. The European Union's Seventh Framework Programme and the new *Horizon 2020* Programme form the reference framework for the works and policies the EU has put into play to support scientific research projects, aimed at developing and applying plans to meet goals for environmental sustainability and reduction of emissions linked to the use of energy resources and industrial activities. Considering the scientific field, a Sea Heritage digital archive could represent a collection point for documentation available for communication and dissemination of scientific research targeting public opinion and schools, to be developed through public-private partnerships. This would provide support for the development of academic and scientific research and studies in collaboration with universities, inter-university consortia and research bodies. The creation of new cultural products constitutes one of the central operations, which a digital archive based on audiovisual works enables to develop a truly original and innovative supply chain. Combining new visual communication technologies with the disciplines intersecting with the concept of Sea Heritage, expressing their applications and distribution according to the various targets identified: the public, students, sector professionals, industry and institutions. The project can also involve traditional and craft production activities linked to the cultural heritage by creating outputs such as publications, (cultural) events, international conventions, workshops, professional training courses, sector trade fairs, education and cultural projects and so on. The possibility to create a direct and measurable connection between the professional activity performed inside the archive, public opinion and the network of international partners, could provide not only for the success of the initiative, but also the consolidation of an experience which could become a model for the production of new cultural assets able to compete on the market. In this sense, the professional training for graduates and other qualified persons represents one of the strategic activities for connecting with the target of young people, universities and the market. Therefore, it be oriented not only towards restoration, conservation and management of the audiovisual multimedia archives, but also towards the development of a series of skills necessary to build a team able to manage the ordinary activities required for day-to-day running of the archive. They must be able to attract investment, co-ordinate public-private partnerships and develop cross-border co-operation for access to EU financing and to develop research projects in the relevant geographic area. Thus we will move

from science communication to professional training and the economic sustainability of a digital archive in the relevant area and in an EU environment which derives private investment and new commercial possibilities linked with science and culture from its ability to represent a hub for lines of financing from the European Commission.

8.3. Brands and Quality Marks

Finally, a completed strategy of recovery, development and repositioning of the area could find both an operational and communicative summary through the creation of a Sea Heritage *quality mark*. This would be, in other words, a certification system which, starting with the mapping necessary to create a digital archive, would be able to promote the production activities linked to sea heritage, favouring them entering the network, increasing employment in the sectors strategically important to area promotion, right up to the creation of a production *centre of excellence* linked to Sea Heritage. This would find a preferential channel in the audiovisual sector for development of the excellences they produce, distribute and invest directly and indirectly in local Sea Heritage. Therefore, the quality mark would have the direct result of creating a *brand* which must be able to combine development of the local heritage with promotion of production using a value-based approach; this would be performed through training, informative and promotional activities based on the local historical and production identity. The Sea Heritage brand could thus represent the glue binding promotion of outstanding economic performers and similar excellence in the scientific, cultural and landscape areas of Sea Heritage, working to facilitate system partnerships between the economic and production players. A brand for the promotion of top producers must be able to link the economic and cultural value of the local Sea Heritage to the international image of *Made in Italy* products and services. Leveraging Sea Heritage could mean allowing the various local players, together with the national system, to recover the competitive advantage which is suffering compared to other countries in the EU in terms of the production of wealth and development linked to the sea. Without considering the tourism sector, the 1,200 ports in the EU indeed absorb around 90% of foreign commerce and 40% of internal trade, thanks in part to the largest merchant fleet in the world. The 5 million people employed by the maritime economy produce 5% of GDP, with coastal regions representing over 40% of the EU's GDP. In the tourism area, moreover, it turns out that the lack of a modern infrastructure network and adequate communication, information and training activities are among the factors which best explain why Italy is lagging behind other countries. With respect to the EU dimension, and starting out with the internal issues, the need is to promote a new entrepreneurial effort linked to a cultural-economic approach which, combining promotion with research, innovation and environmental sustainability, will allow Italy to take back that leading

role which its Sea Heritage should naturally qualify for. Thus, building a brand, in light of Italy's infrastructural failings and the lack of a strategic vision counting on the sea as a platform for economic and production recovery, will have an effect at a local and national level, creating a genuine *Sea heritage supply chain*. This will be able to present itself as the preferential communication channel for national institutions and put forward projects which can integrate themselves in regional planning policies and local development processes according to the EU's recent leanings and directives.

9. Conclusions

The field of possible applications of popular communication for the promotion of the responsible use and sustainable development of the resources represented by our Sea Heritage gives a glimpse of a path in which tools and approaches from different contexts, designed for apparently different ends, can be combined -such as open access, digital archives and quality marks. These tools also offer new possibilities for sharing and distribution of knowledge and information which can also favour the creation of new professional figures linked to the coming of age of the digital era. Such trajectories, as well as facilitating international collaboration and the creation of multidisciplinary networks, can actively contribute to the activities of the public and private players working on innovative marketing plans and regional promotion programmes.

The new directions that the collection and management of metadata is taking are naturally leading to the requirement to establish an up-to-date digital database in order to structure industrial or commercial projects concerning the same areas. This would be managed by a body with the mission to collect the scientific, cultural and social output from European research and studies on the sea and coast, also working on the organisation and streamlining of historical archives concerning particular settlements.

In the wake of this, Rome's coastline, particularly the Ostia area, can and must obtain recognised excellence on a European level. As president of an NGO which has been working for decades to develop and make the most of the invaluable resources represented by Sea Heritage and which provide leverage for cultural, scientific and economic promotion of the country, I feel we must all work on the area's potential. We must put forward a new image of Rome as a European capital which is able to characterise itself not only as a centre of production and promotion of culture, art, science and academic learning, but as a centre of excellence for the production and promotion of audiovisual products as the essential tool of modern multimedia communication.

PART 2.

INNOVATIVE COOPERATION BY TECHNICAL INSTRUMENTS

CHAPTER 4.

Monitoring Children's Vision of Mass Tourism in Historic Centres by Means of Photography: Presentation of a Case Study's Working Method[1]

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1 Selected children's photographs presented at the exibition of the Preserving Place European Culture Project International Congress held in Rome, 13-14 November 2009.

1. Introduction

Why gathering data through children's pictures? It is a good question, given the inexistence of previous background for this method of data collection.

A scientifically defined sample in order to obtain the necessary information in research projects –like the ones concerning the preservation of historic city centres or neighbourhoods– has always taken into consideration the percentages of various components of the social mix that live in the area under study. Children are never interviewed during data collection. Of course there are good reasons for this – children will not answer questions related to financial concerns, racial problems or buildings maintenance issues. Nevertheless, when quality of life comes at stake (a topic of *Preserving Places* project) children's voices may be important concerning an extended view of what is gained and what is lost when mass tourism invades historic neighbourhoods.

Throughout the long process that has characterized the definition of what is the preservation culture –intended here mainly as urban preservation– there have been different points of view about the values that historic centres were representing. But whatever these values were believed to be – mainly aesthetic, or historic, national, economical, or else– the feeling of the historic area's *difference* (fig.4.1 and 4.2) compared to the rest of the city (fig.4.3) never ceased to be present.

Figure 4.1. Three year old child's drawing.

Figure 4.2. Venice, 1988 (photo by Antonis Zivas).

Figure 4.3. Five year old child's drawing.

From 1890 onwards, people concerned with preservation have always made a point about the old town's almost mystical dimension, that produces a feeling completely different by the one generated at its modern expansion. Since the late 19th century conservation experts have often talked about the attraction that historic neighbourhoods had on city dwellers as well as on tourists.

It is not a revelation of our days that historic centres not only fulfil the very important role of collective memory bearers (fig.4.4), thus acting as a means to identity consciousness; but they are also seen as areas that offer a unique quality of city life (fig.4.5).

Figure 4.4. Brugge, 1993 (photo by Antonis Zivas).

Figure 4.5. Bologna, 1988 (photo by Antonis Zivas).

What the modern movement of airy and luminous linear streets lacked was precisely this quality of life which develops in a public space that combines history with the possibility of close social exchange, giving its residents the opportunity of living in a certain way *within tradition* (fig.4.6 and fig.4.7). Many factors prove this point today, with historic areas' current land values being one of the most convincing.

Figure 4.6. Bologna, 1988 (photo by Antonis Zivas).

Figure 4.7. Bologna, 1988 (photo by Antonis Zivas).

Although tourist attraction has always been welcomed by citizens and city authorities alike, it is widely understood that, during at least the last two decades, mass tourism pressure on delicate historic areas alter public space characteristics and deteriorate life conditions for its inhabitants. (fig. 4. 8).

Figure 4.8. Rome, Fontana di Trevi square, 2008 (photo by Antonis Zivas).

The case of Venice stands out as one of the most interesting examples for the direct consequences of this phenomenon. The city gains considerably with respect to the financial sector but it loses identity – Venice does not belong only to Venetians any more (fig.4.9 and fig.4.10).

Figure 4.9. Venice, 1988 (photo by Antonis Zivas).

Figure 4.10. Venice, 2006 (photo by Antonis Zivas).

The "Preserving Places" project aimed at the definition of possible ways for dealing with the re-appropriation of quality historic urban areas, thus giving to the term "conservation" an adequate meaning. To this respect, it aimed at improving data collection by including also children's voices. Adults' reactions and their understanding of mass tourism invasion could be considered as granted or predictable, but there was no available knowledge of children's points of view. As for example, which parts of the city and at what time were of more interest to them (or considered to be most intimate), or what were *their* considerations about what could be the major problems caused by tourists – if there were any (fig.4.11).

Figure 4.11. Brugge, 1993 (photo by Antonis Zivas).

A way of getting this kind of information is through written or oral interviews. This project experimented an alternative means of collecting information – children's photography.

2. A method of approach

Since we had to deal with children we needed to make certain that we were addressing ages that had acquired as little as possible of an adult behaviour. Metaphorically speaking, if we resort to painting as a tool to collect our data and if we had to choose between these marvellous drawings children are able to create at a very early age (a skill that is very quickly lost as soon as schooling begins to prepare them for 'maturity'), and those that are generated at a later date – usually after their 10th year of age (fig.4.12), we would have been delighted to have their early drawings instead of the others (fig.4.13).

Figure 4.12. A. Lorenzetti, Effetti del Buon Governo in Città, 1338-39 (detail).

Figure 4.13. Five year old child's drawing.

Photography is a different means from painting, and a much more complicated one when compared to the procedures requested by drawing or painting, where one has to use a pencil or a brush – things that have always been natural with humanity. In order to teach children the very basics of the photographic function we made the hypothesis that those between 10 and 12 years old might be old enough to understand and, at the same time not old enough for having already lost their childhood.

We contacted one elementary school and one middle school situated in a central historic area of Rome, the "Emanuele Gianturco" State Elementary School at Via della Palombella, Pantheon, and the "Ennio Quirino Visconti" State Middle School at Via IV Novembre, very close to Piazza Venezia. The research area, locally called the "*tridente*" by the shape of the three converging streets at Piazza del Popolo, that delimit its boundaries, is one of the most touristically congested zones of the whole historic centre. Its various monuments, among them Fontana di Trevi, the Spanish Steps, the Pantheon, piazza Navona and piazza del Popolo, act as mosquito nets for the catching of as many visitors as possible (with tourist loads going considerably over the area's carrying capacity).

We had an enthusiastic response from the schools' administrations as well as from the parents' side. We started with a photography course that involved the last two elementary classes' pupils and the second middle school's class (ages from 9 to 13 years). The course passed as much information as possible while at the same time it launched the guidelines to follow for the gathering of scientifically usable photographic data.

3. A working method for the definition of a biased photography course for children

A university level course of photography, usually, begins by revealing to the students the secrets and mysteries of the darkroom. Later on, it deals with the digital evolution, for finally entering the fields of professional photography. Throughout the length of the course, information is given on topics such as the medium's history and/ or its communicative and expressive potential (fig.4.14).

Figure 4.14. André Kertész, Paris 1929.

A short course for children that mainly aims to data collection cannot follow the above mentioned procedures. The program agreed with the schools' administrations was divided in two different parts. The first one approached theoretical issues like the nature of photography, its origins and operative modes. The lessons –simplified to children's level– were delivered by means of a number of lectures (the presence of a darkroom was obviously missing). In order to have a better understanding of basic photographic topics (such as analog or digital capture, exposure and light control mechanisms, aperture and depth of field, shutter speed and representation of time, importance of framing and vantage point) a little introductory book was written specifically for the project's aims and distributed among the pupils (fig.4.15).

Figure 4.15. A.Zivas, A Short Experimental Photography Course, 2009 (cover).

For what concerns cameras, children were allowed to bring whatever cameras they could put their hands on – daddy's old film camera, their pocket digital, even one use disposable film cameras (in 2008 handy cell phones were not broadly used by children for picture making).

Together with the introduction to the basics of the discipline, children were asked to create pictures with tourist flows as a subject matter. This second part of the course was carried out through group meetings between limited numbers of pupils (one or two classes at the time) and the instructor. In this part the young photographers' pictures were brought out, discussed and evaluated according to the information contained in them as well their communicative potential. The course's main challenge was that of helping children to produce pictures that in a certain way were representative of their intentions.

Selected pictures at the end of the course were digitalized (when needed) and edited for their presentation to the public (without altering in any sense their original characteristics). An exhibition of the pictures was held at the elementary school's premises. Another exhibition was held at the "Hadrianeum" conference hall in Rome, piazza di Pietra, during the program's conclusive international congress on 13-14 November 2009.

4. What to photograph

Tourist's traffic varies during different seasons as well as during the different hours of the day. Season variations are easily observed by children since they go to school almost all year round (summer vacations are the only exception, but even in this case June's tourist loads in Rome can simulate the hotter months' traffic in most downtown areas). As for the monitoring of a day's load through the various hours, it is well known that children are early risers (not by choice, of course) so they can take photos early in the morning, when visitors usually have breakfast and the city is quiet (fig. 4.16), and then again when they finish school (which in Italy takes place at either 1.30 p.m or at 4.30 p.m.) in order to get back home, this time through crowded streets (fig.4.17).

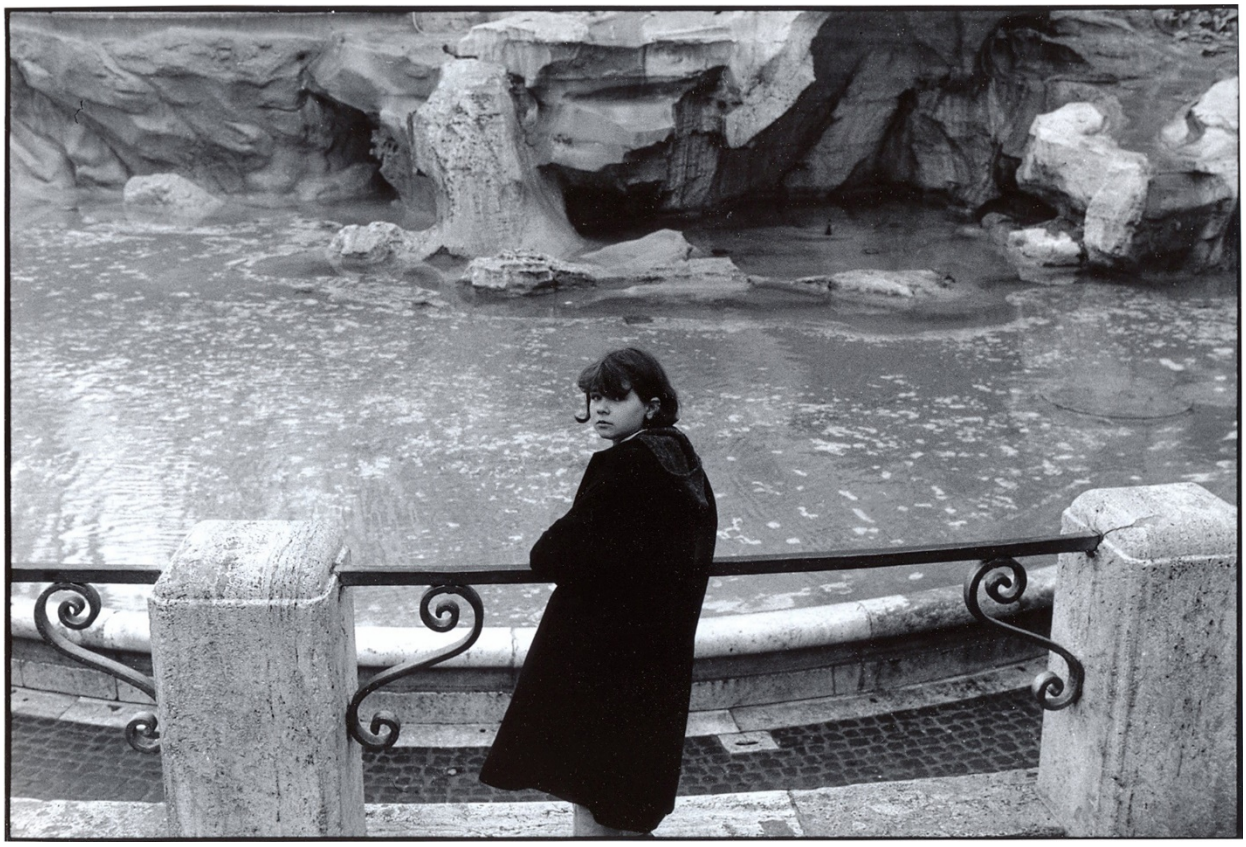
Figure 4.16. Venice, 1988 (photo by Antonis Zivas).

Figure 4.17. Vienna, 1988 (photo by Antonis Zivas).

As a result, we have various pictures of empty and crowded city landscapes as they were photographed during the children's usual home-to-school and vice versa paths, and others in the broader area's 'hot spots' where tourist loads come to truly exaggerated levels. Mass tourism often brings mass cultural events that are really remarkable in Rome's historic centre. Ancient roman gladiators roam at places like the Colosseum or Fontana di Trevi asking 2 euros-a-shot for posing together with a tourist. Vendors of marble statuettes, sellers of the latest orient made kids' toys and tourist oriented beggars complete Fontana di Trevi's background during an ordinary

Easter vacation afternoon. Children were encouraged to photograph the photographing visitors during the busy hours' traffic chaos. The resulting contrast with the same places' peaceful early morning impression was extraordinary. I remember accompanying my daughter to Fontana di Trevi's elementary school at eight o'clock a.m., when there was something of a magic in the air as we had the whole place to ourselves (fig.4.18).

Figure 4.18. Rome, Fontana di Trevi, 2008 (photo by Antonis Zivas).



When I came back in the afternoon to pick her up I often had to struggle my way against a flood of Asiatic tourist groups, European youths having pizza and ice cream, shopping crowds and families at a stroll (fig.4.19). What the *Places* program tried to ascertain was the existence of possible ways for the rehabilitation of the historic centre's potential for a quality of city life (fig.4.20).

Figure 4.19. Rome, Fontana di Trevi square, 2008 (photo by Antonis Zivas).

Figure 4.20. Vienna, 1988 (photo by Antonis Zivas).

What this photographic experiment aimed at was possible suggestions for better surveying methods through the eyes of the young (fig. 4. 21; fig.4. 22; fig. 4. 23; fig. 4. 24; fig. 4. 25; fig. 4. 26).

Figure 4.21. N. Amato, children's project photograph.

Figure 4.22. C. Gaeta, children's project photograph.

Figure 4.23. N. Amato, children's project photograph.

Figure 4.24. R. Laurenti, children's project photograph.

Figure 4.25. J. Badia, children's project photograph.

Figure 4.26. N. Reiner, children's project photograph.

5. Conclusions

The experience of science dissemination carried out within the Project Preserving Places has allowed us to clarify a number of elements:

1. In order to succeed the process cannot be unidirectional. The researcher has a proposal which has to adapt to the demands and the points of view of stakeholders;

2. Photography is an instrument which lends itself well to a two-way process – the photographer's point of view as well as the photograph's potential. In this case the children have clearly shown the world as it appears to them;

3. The boys and girls who live and/or go to school in the historic center of Rome expressed through the photographs an original view of the otherwise well researched phenomenon of mass tourism;

4. There are obvious messages regarding the conflict among those who visit and those who live in the historic area of Rome.

6. References

Montanari A. (ed.) 2010, Special Issue on Preserving Places. Managing mass tourism, urban conservation and quality of life in historic centre, *Rivista di Scienze del Turismo*, 1 (2).

CHAPTER 5.

Employing researches, stakeholders and end-users in research projects: networking, forums and the social media

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1. Introduction

The EU funded research groups have been urged to collaborate with end-users and relevant stakeholders in the research stages and dissemination. These projects would be partially shaped by these external parties assuring that results would be beneficial to both research prospects and professionals transcending the academic world. The EU FP7 funded project, SECOA (Solutions for Environmental Contrasts in Coastal Areas) emphasized the significance of this interaction as a partial determinant to the project's success and legacy. Stakeholders and end-users participated in periodic meetings and contributed to the various assignments. Project SECOA is comprised of institutes from eight participating countries (Belgium, India, Israel, Italy, Portugal, Sweden, Unite Kingdom, and Vietnam) and offered a transdisciplinary approach to coastal research. The following is taken from the SECOA website in the section devoted to the end-user panel:

> "SECOA will involve end-users from most of the areas considered (from the participatory countries)… innovative methodology for analysis will be developed, tools for appropriate policies will be created, alternative scenarios will be built, step-by-step results will be disseminated and exploited for specific users needs. SECOA will set up the End-user Panel that includes representatives of local and national institutions, such as Municipal Managers and Administrators for urban, environmental, cultural, health issues, Environmental Agencies, Agenda 21 etc.
>
> This End-users Panel will indicatively include representatives from some institutions as in the table below (listed in the site). SECOA will also invite participation from international partners such as the European Environmental Agency (EEA) and the European Regional Office of the World Health Organization. The End-users Panel meets once a year to evaluate the project's progress, and is also intended to provide, at national level, direct interaction to support cooperation between end-users and researches at different levels of project activities, thus allowing the end-users to give input, suggestions and feedbacks to the project's activities. Prior to the panel meeting, panel members will also be involved in activities to verify that environmental contrasts have been suitable identified. Throughout the project they will verify the usability of project output, that is the readability and applicability of the solutions described. The most important impact of the panel will be that of paving the way for the long term adoption of the proposed solution.
>
> The End-users Panel will also act as an open forum for discussion and synchronization within the project consortium. In order to highlight the availability of results, it will be provided with public access to selected deliverables including technical overviews. After assessing the above mentioned documents, the Panel will give feedbacks and suggestions for the future direction of the project.[1]

[1] Source: http://www.projectsecoa.eu/index.php?option=com_content&view=article&id=76&Itemid=72).

This paper focuses on the role of the forum and the means in which the project attempted to interact with stakeholders outside the standard platforms of meetings and personal interaction with the teams involved. Two methods were chosen for this endeavour the first was the use of a forum within the SECOA project website offering access to the project's research, and the second was the creation of a LinkedIn group focusing on beneficial output to end-users and exposure to the general public. Interaction within these platforms would enable the project to extend its reach outside the academic sector and enable input from end-users on issues raised by researches. It is important to note that regular input from members of the project and end-users is a key ingredient to ensure the success of these platforms. In addition to the success of the project, the forum and the LinkedIn group were also created to bring together the end-users and possibly generate future cooperation between those with similar interests.

Nevertheless, project meetings offered a platform for end-users to interact, however, between those meetings minimal interaction existed between end-users from the different participating countries. While the forum existed from the start – primarily for the researches' use – the idea of a LinkedIn group and the use of social media was only brought up during one of the later periodic meetings participated by end-users (in Mumbai during December 2012). One of the issues emphasized by the end-users during that meeting was the issue of communication, calling for, among other things, effective dissemination and end-user networking. This was followed by a suggestion to create a forum on the website dedicated to end-users where they could discuss and interact. The use of the social media was stressed as an accessible platform that would expose them to the research (Minutes of the 6th Project Meeting 3rd – 7th December 2012; Mumbai, India).

The goal of this paper is to examine tools encouraging cooperation, data management, and interaction between academic research teams, and between end users and stakeholders. Fulfilling the requirements of EU funded projects requires such interactions but, as will be further discussed, such interactions have proven intricate and at times frowned upon. This paper primarily focus on the use of internet based tools; however some insights will offer general suggestions on how to achieve the equilibrium between involving end-users and continuing academic oriented research objectives. This paper can assist future projects who wish to encourage interaction and collaboration with end-users, create a professional legacy while maintaining and producing academically oriented results, networking, and alternative dissemination platforms. One of the significant factors that need to be taken into account is the relatively late stage the project was in when the end-user forum and LinkedIn group were set up. It begins with a brief survey of the literature on the collaboration between academics and practitioners (stakeholders/end-users), followed by a review on the role of social media in research. Then, it relays in the conceptual model and the concept of this research followed by the methodology, results from the forum and the LinkedIn group, ending with conclusions and recommendations.

2. Transdisciplinarity, Stakeholders and the social media

EU framework programs have in recent years called for a different approach to the type of research conducted, transcending the traditional academic research methods and entering the trans-disciplinary one. Such research is characterized by interdisciplinary research and ongoing involvement of stakeholders and end-users in the research (Bruce *et al*. 2004*)*. This type of involvement often allows the access to data, additional funds and research subjects. As Lawrence and Després (2004) note, "The lack of effective collaboration between scientists, professional and policy decision-makers has led to the 'applicability gap' in sectors that deal with both the natural and human-made environment".

The involvement of stakeholders in transdisciplinary research is to make sure that the 'right problem' gets addressed 'in the right way'. The role of the stakeholder is to inform the scientists and supply their knowledge about how things really are and what they think should be done, while it's the scientist's duty to enlighten their stakeholders (Maasen and Lieven 2006). Co-production of knowledge – involving academic and non-academics – is essential for sustainable development; striking a balance between scientific and other forms of knowledge (Pohl *et al.* 2010, Lang *et al.* 2012).

Environmental issues and problem solving require collaboration and the integration of different research disciplines. Research on the complexity and identification of environmental 'problems' must consider a variety of methods and approaches that only exist in interdisciplinary research (Brewer 1999). Transdisciplinary approaches take into account the integration of disciplines but, unlike the interdisciplinary research methods, it also takes into account the differences that may emerge between the disciplines thus concerning the articulation between disciplines rather than their relations (Ramadier 2004).

Starkey and Madan (2001) have set a tone for the strategic need to increase partnerships between academics and practitioners in academic research. The emphasis, as they note, should be to create relevant research that serves the requirements of both academics and stakeholders. Closing the relevance gap requires that researches creatively address issues of research content, process and dissemination. While Starkey and Madan's (2001) study focused on management research it has served as the basis for an increasing awareness of the involvement of stakeholders in social research. But properly executing such innovative research and 'bridging the gap' methods must also require properly equipped personal capable of unifying the various academic and non-academic stakeholders (Hodgkinson, Herriot and Anderson 2001). This would create work that is rigorous both theoretically and methodologically, and cantered on issues of focal concern to wide community of stakeholders.

Participatory efforts between academics and stakeholders play a particular crucial role in environmental modelling, as the complexity of issues grows and the demand for knowledge and data of various accounts increases. Modelling should serve both the academics and stakeholders and should therefore be constructed to achieve this and not just focus on the academic perspectives (Voinov and Bousquet 2010). While the research methods call for collaboration, another significant element in today's research focuses on the results and assessing the impact of research and on the end-use relevance in addition to the academic beneficiaries (Luukkonen 1998).

End-users should refer to those who directly benefit from the research and utilize the output of the research (Molas-Gallart *et al.* 2000). Assessing the impact on end-use is difficult but managing and meeting future expectations of end-users is crucial and should be part of the research objectives (Lyall *et al.* 2004).

Knowledge dissemination by universities has become a crucial factor in university policy making. Increasing interaction between academics and professionals, as well as university-industry partnerships and the new funding sources has led higher-education institutes to rethink knowledge transfer (KT). Higher-education institutes engaged in such partnerships need to ensure that the dissemination of knowledge is not being constrained by private interests (Geuna and Muscio 2009). Universities have become an important source for industries through the production of relevant knowledge and innovations (Geuna and Mowery 2007). Diffusing information and innovation's spillover benefits researchers and enables supplementary innovations (Harhoff *et al.* 2003).

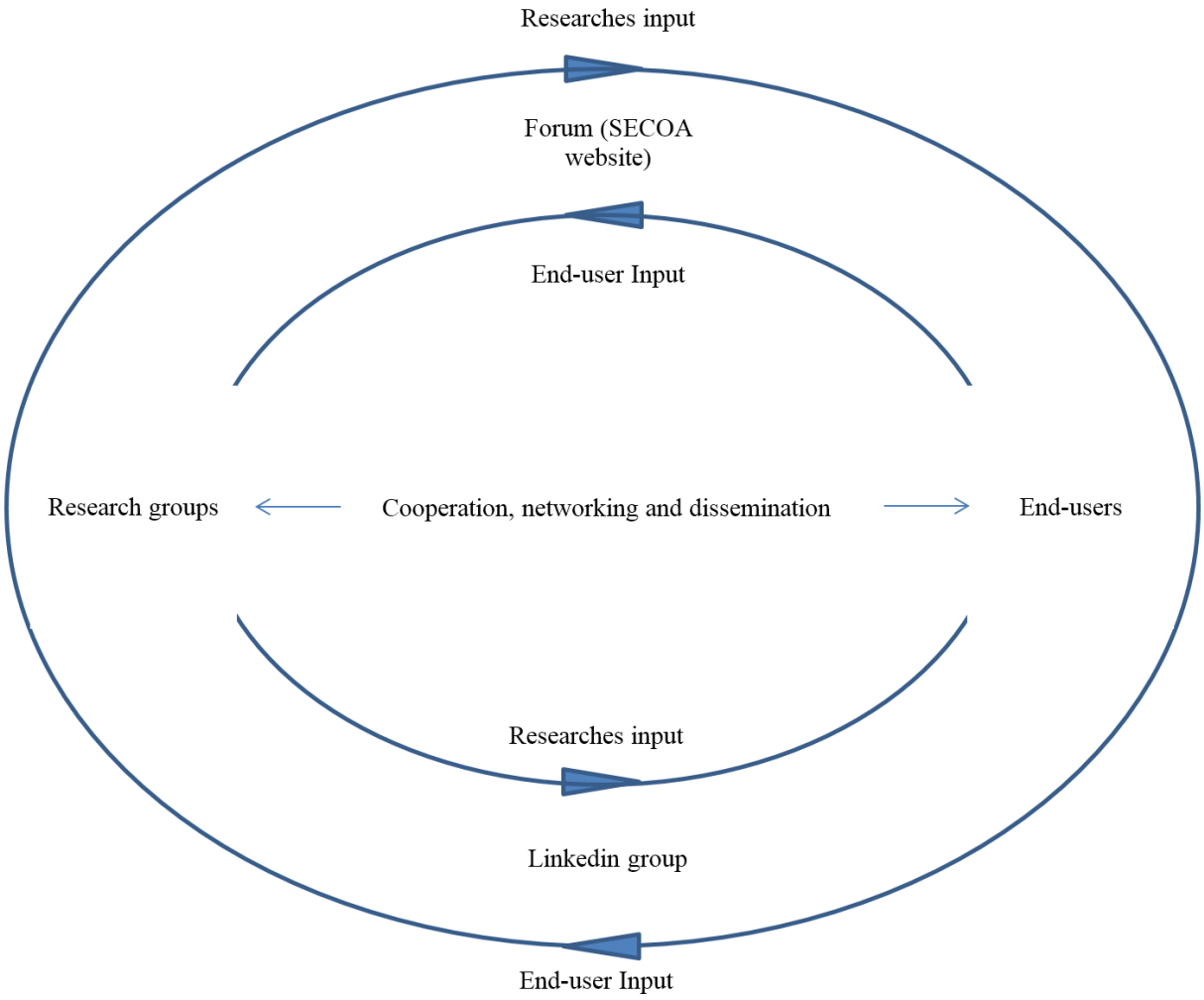
In an era of increasing academic-practitioner collaboration and dependency, the involvement of stakeholders and knowledge dissemination are intertwined in the research process itself (Enders 2005). Internet has become a platform for the publication and distribution of open-source information enabling public access to the data and reaching out to a wider public (Lymer 1999). Internet has changed the approach to academic dissemination as it creates a linked global research community which in turn, links to research users in all sectors at all levels of society (Daffy 2000).

The use of social network sites (SNS) for knowledge based transfer has been debated as the majority of interaction involving social use rather than academic (Wodzicki *et al.* 2012). The use of SNS in formal and informal education settings is growing in popularity and provides influential tools for e-learning communities that may include decision makers. Higher-education institutes can use the social media to increase their presence within the community and their impact on society. Official SNS accounts of higher-education institutes offer a platform for scholarly, academic and professional data-sharing and content consumption by the wide community (Forkosh-Baruch and Hershkovitz 2012).

2.1. Conceptual model

The conceptual model for this research emphasizes the role of researchers and end-users in each of the platforms: SECOA forum and the LinkedIn group. Figure 1 depicts the role of each of the groups represented by the size of the arrow. As seen, in the forum, the dominant contributor should be the researches with marginal input from the end-users. In the LinkedIn group the effort should be somewhat even. End-users are expected to be more involved as it serves a more specific objective as opposed to the forum that is marginally used by the researchers in order to relay questions and sharing data. Efforts in the LinkedIn group are based on preliminary input from the researches followed by active discussions and input by the end-users.

Figure 5.1. Distribution of effort in the two web-based platforms.



3. Methodology

As proposed in one of the project's meetings, two internet based platforms were established: the forum and a LinkedIn group. The intentions were to sign up as many of the end-users on each of these platforms, create discussions, and encourage them to take control of the discussions with the assistance of researches from the different teams. The early stages required that a group administrator take control and generate preliminary discussions. Assessing the significance of these platforms to the project and its research would be determined by: i) the participation of researches and end-users; ii) the relevancy of the messages posted; iii) thetime passed between posts; iv) the number of posts initiated by the researchers and the end-users; v) the number of actual comments as opposed to 'likes' (used in LinkedIn) and finally; vi) the number of participants in each of the groups.

3.1. The Forum

One of the features in the SECOA website was a forum originally created for the benefit of the researchers to discuss research prospects, consult with fellow researchers and share data and methods concerning the various work packages. Following the meeting in December 2012 it was decided to start a group within the forum for the benefit of the end-users. This would also provide them access to other discussions going on in the forum. Some data on the forum itself will be provided in order to establish the potential success of this method in research projects and how it affects the use by the end-users. The first stage in the research was the creation of the end-user group in the forum; this was followed by the registration of end-users in the forum (emails were sent out with login data, passwords etc. and information on how to sign up). On the administrator level, discussions were set up in an attempt to create following and extensive participation by the end-users. Analysis will focus on the number of people who joined the forum, number of comments and the type of comments.

3.2. LinkedIn group

The purpose of the LinkedIn group was to create a group for researchers involved in the project, end-users, stakeholders and other external agents. Accessibility and the use of a public platform as opposed to the forum's private access meant that parties who are already

on LinkedIn could receive updates on progress in the project and knowledge on dissemination without having to log-in or access a single-purpose site. Similar to the forum, discussions were established for each of the project's work packages, primarily for the use of researchers and for viewing the work being done, a discussion for end-users and stakeholders whereupon they can converse among themselves and post suggestions for the project, and finally a discussion devoted to dissemination. The group was setup to allow any member of LinkedIn to join keeping it open access and potentially expanding its reach to external interest groups. Unlike the analysis of the forum that focuses primarily on the end-user discussion and participation, the LinkedIn group will also take into account the participation of researches in the group. This is due to the significance of their participation and the influence it may have on the end-users.

4. Results

4.1. The forum and end-user participation

As mentioned above, in addition to analysing the efforts with end-users and stakeholders, the purpose of this paper is also to provide some background on the use of a forum and social networks sites, hence in this section a partial analysis of activity in the forum including efforts that did not involve end-users is also included. It is important to note though, that by allowing end-users free access to the forum it exposes them to the research process and they could in-turn extract useful data and contribute to the conversations. Uploading a forum in the SECOA webpage was designed to allow access to data transfer, create conversations on the assignments, provide answers on frequently asked questions, and allow the researches to view the work being done on all the work packages. Table 1 summarises the activity in the forum and includes the subject, number of topics opened in each subject, number of posts and the last post.

Table 5.1. Summary of activity in the SECOA forum.

General discussions			
Forum	Topics	Posts	Last post
End user Panel	4	6	Feb 19, 2013
Open forum	5	12	Feb 16, 2012
The SECOA team	2	2	Dec 16, 2011
Work packages data discussion			
Forum	Topics	Posts	Last post
Work Package 1	13	44	Jan 18, 2012
Work Package 2	12	47	Nov 04, 2011
Work Package 3	10	12	Nov 12, 2011
Work Package 4	2	4	Aug 23, 2011
Work Package 5	17	36	Aug 07, 2012
Work Package 6	3	10	Feb 06, 2012
Work Package 7	1	1	Mar 12, 2012
Work Package 8	0	0	No posts
Using this website			
Forum	Topics	Posts	Last post
Announcements	16	20	Aug 07, 2012
How do I…	11	12	May 13, 2011
Bug reports	9	24	Jul 22, 2011
Feature requests	2	13	Nov 28, 2011
Moderator discussion	28	75	Aug 01, 2011

Table 2 summarises the duration of activity for each of the Work Packages (WP) in the forum; number of days and how long each of the discussions within each topic lasted (days, weeks or months). These tables reveals a clear distinction between the WPs and their orientation towards quantitative analysis and qualitative analysis. The latter shows far less activity. Another noteworthy issue is the deterioration in activity as the project progresses. This is evident from the lack of activity in WP8 and minor activity in WP6 and WP7 that started after the second year of the project. Duration of each discussion was relatively short with the majority of them lasting less than a week.

Table 5.2. Duration of the activity of each of the forum topics discussing the WPs.

			Activity duration	Discussion duration (days/weeks/months)		
	First post	Last post	(days)	Days	Weeks	Months
WP1	14.4.11	18.1.12	280	9	3	1
WP2	14.4.11	4.11.11	205	8	2	2
WP3	1.7.11	12.11.11	135	10	0	0
WP4	1.7.11	23.8.11	54	0	1	1
WP5	11.5.11	7.8.12	455	14	2	1
WP6	19.12.11	6.2.12	50	1	1	1
WP7	12.3.12	12.3.12	1	1	0	0
WP8	-	-	0	0	0	0

Table 3 can shed light on this issue as many of the discussions were often viewed but replies were shortcoming. The pattern is similar in each of the forum topics with a proportionate difference between views and replies – the four most active topics highlight the mentioned differences. Although WP3 had 10 discussions only 3 replies were posted but had 139 views, even more so, WP5 had 17 discussions with only 19 replies but 372 views.

Table 5.3. Replies vs. Views for each of the WP topics.

	Number of discussions	**Replies (total)**	**Replies (average per topic)**	**Views (total)**	**Views (average per topic)**
WP1	9	31	2.38	393	30.23
Wp2	12	35	2.92	381	31.75
WP3	10	2	0.20	139	13.90
WP4	2	2	1.00	101	50.50
WP5	17	19	1.12	372	21.88
WP6	3	7	2.33	116	38.67
WP7	1	0	0.00	15	15.00
WP8	0	0	0.00	0	0.00
			1.24		25.24

In addition to the forum topics dedicated to the WPs and research groups, three topics were dedicated to other purposes (Table 4), the first and most significant for this paper is the end user panel. Also appearing is the 'open forum' and 'the SECOA team'. The latter was supposed to allow people to post general information on themselves and their research (only 2 people posted here); the former – open forum – provided a platform for general information relevant to the project.

Table 5.4. Non work package related discussions.

Topic		Discussion	First post	Last post	Replies	Views
End User Panel	Personal data	1	7.2.13	19.2.13	1	7
	End user feedback	2	18.2.13	18.2.13	0	8
	Updates on SECOA project progress	3	6.2.13	7.2.13	1	7
	Introduction	4	4.2.13	4.2.13	0	6
Topic		**Discussion**	**First post**	**Last post**	**Replies**	**Views**
Open Forum	Sitedowntime (admin)	1	8.3.11	16.2.12	7	19
	Socio-economic benefits of marine spatial planning	2	12.12.11	12.12.11	0	2
	Free download of book "Climate of Coastal Cooperation"	3	15.11.11	15.11.11	0	3
	Nature Climate Change article relevant to SECOA	4	6.10.11	6.10.11	0	4
	European Commission Consultation on ICZM	5	29.4.11	26.4.11	0	7
Topic		**Discussion**	**First post**	**Last post**	**Replies**	**Views**
The SECOA team	Place for people to post information on themselves	1	16.12.11		0	5
		2	26.10.11		0	15

Success rate in each of these three topics was minimal with only a small number of views and even less replies. Focusing on the end-user panel, four discussions were set up:

1. Personal data - where end-users could post about their jobs and interests;
2. End-user feedback - dedicated to a questionnaire that was sent out to the participating institutes to be filled out by the end-users;
3. Updates on SECOA progress – inform end-users on the research being done and meetings
4. Introduction – an introduction message into the forum

On the first topic one reply was posted by one of the English end-users and eight views were recorded. The other topic with one reaction was the third topic focusing on progress in the project.

As stated in the introduction, the concept of integrating the end-users into the forum was only brought up in the later stages of the project. In order to set up accounts it was first necessary to prepare a list of end-users (receiving the information from the participating teams), then distribute emails to all the end-users, and set up accounts. It was then down to the end-users to activate their users. A clear obstacle that is both evident from this endeavour and the LinkedIn group is the language barrier. Collaboration with end-users at the local level was possible as the common language existed however it was noted by some teams that the language barrier may hamper attempts to integrate end-users into the English run forum. Another problem that was noted in the literature review is the necessity to uphold the interest of end-users in order to get their attention and ensure their continuous participation in the project's online discussions.

During the month of January, 16 end-users joined the forum, however only two posted messages. In the emails that were sent out, they were asked to post in the end-user panel an introduce a message. Unlike social forums where people enter on a regular basis as it concerns their own personal interests, the SECOA forum was based on a professional agenda and hence required that people check-in even though they may have not posted messages themselves in the past. Among the predicaments in setting up an end-user panel this has proven significant as the end-users are volunteers in terms of the project and hence are not obliged to participate. The end-user panel in the forum can be defined as a failure and in the conclusions this intends on making suggestions that could assist future projects in better utilizing this channel.

4.2. LinkedIn – linking academics and professionals

In January 2013, LinkedIn announced that the number of members has exceeded 200 million. LinkedIn is defined as a special interest professional networking site and is business-oriented, focusing on connections and networks. While the use of LinkedIn offers public access to the project through the creation of the group, the clear limitation of this initiative is the assumption that not all of the project's participants, stakeholders and end-users are members. Unlike the forum though, anyone can join the group thus extending the outreach to other professionals and academics and offering a simple way for those interested in joining.

The SECOA LinkedIn group was created in December 12, 2012, as a professional group and currently has 26 members from 7 different countries: Portugal (7), Israel (4), Italy (4), Belgium

(5), UK (2), Finland (1), and Sweden (2). Of them, 19 are researchers in the project and 7 are end-users/stakeholders. Table 5 summarizes the activity in the group including number of members, nature of the member (researcher or stakeholder/end-user), and number of discussions started and by whom, posts, and 'likes'. As the table depicts, throughout the duration of the project posts were minimal and only one discussion was started by a non-administrator. This can be attributed to the nature of web-user (Car 2008), to an influx in messages from LinkedIn often leading to people ignoring the message, or progressive lack of interest in the project.

Table 5.5. Summary of activity in the SECOA LinkedIn group.

Country	Number of members	Researcher	Professional	Participation		
				Started discussions (by non admin)	Posts	Likes'
Belgium	5	2	3		1	
Finland	1		1			
Israel	4	3	1	10(1)	5	2
Italy	4	4				
Portugal	7	6	1		1	3
Sweden	2	2				
UK	3	2	1		1	1
Total	26	19	7	10	8	6

As mentioned above, the concept of starting a LinkedIn group was conceived in the later stages of the project after the majority of work was done and several social ties had already been established between end-users, researchers and stakeholders. These links meant that the majority of interaction were done through personal channels (e.g. email) and opinions on the project had already been established. While some professionals joined the group, their contribution was minimal, similar to the contribution by the researchers.

Discussions were set up to cover the work packages that were still being worked on (WPs 6-9) in an attempt to involve stakeholders in the actual process. A discussion was set up for end-users and updates with links to the conference that took place in Lisbon (June 2013) were posted. Other than a few 'likes'. activity was minimal. One post that generated interest with the potential to reach out to the public and constitute dissemination efforts valuable to the success and legacy of the project was a post by a member of the Israeli team – Michal Lichter. The post referred to

the preparation of map simulation and the effect of sea levels rise (SLR) and the event of extreme weather causing flooding[2]:

> "We are proud to introduce our new dynamic on-line web-maps, based partially on our work in SECOA. Potentially this tool can assist in democratizing the process of participation in decision making and enhancing public accessibility to important information.
>
> Our interactive maps (link: http://ccg.huji.ac.il/dynamicmap/index.html) present an assessment of population and assets at risk from sea-level rise and extreme coastal flooding in Israel. The maps are divided into three different categories: Socio-economic vulnerability, Population at risk, and Assets value. The maps enable the interactive generation of national and municipal level assessments in the form of graphs and charts by clicking on the potentially flooded areas."

Representing the essence of keeping a public group, this post offers both academicians and practitioners insight into the work being done, progress, and utilization of results for practical use. Knowledge transfer in this instance was open-source and exposed some of the research methods and concepts conducted in the SECOA project. While this post was only accessible to members of the group, end-users and stakeholders who are members of the project's LinkedIn group can transfer the knowledge to the wider community.

5. Conclusion and recommendations

In July 2008 Nicholas Carr published an article in *'The Atlantic'* titled: Is Google Making Us Stupid?'[3]. In this article Carr was highly critical of the influence the web had on his and other capacity to read and sustain their attention on a piece of information (i.e. article or web page) for a long period. His claim was that his and others attention span was shortening the longer they spend on the use the internet and that their ability to stay on one web page was decreasing as well. Unless the topic at hand is of real interest or a requirement people's attention will be diverted to the endless other options the web offers them.

In an attempt to generate collaboration and knowledge transfer between academicians and practitioners, the project SECOA, an EU 7th framework funded project, in its proposal emphasised its agenda to involve end-users and stakeholders throughout the projects stages. This included periodic meetings attended by them, and local workshops and data sharing. In one of those meetings it was decided to create an end-user panel in the project's forum and create a LinkedIn group dedicated to the project and dissemination of the results to the wider community.

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2 http://ccg.huji.ac.il/dynamicmap/index.html#!

3 http://www.theatlantic.com/magazine/archive/2008/07/is-google-making-us-stupid/306868/

The forum for research purposes were only utilized in the earlier stages of the project as researches opted to transfer data and debate research methodologies using other channels such as direct contact through email. It was evident that the forum was losing the battle and as shown above.Later work package topics appearing in the forum such as WP7 and WP8 were more or less obsolete. The LinkedIn group while being joined by researches and end-users from various countries also faced barriers as the number of posts was minimal. Additional research may reveal that some links transpired between end-users and stakeholders through this group leading to potential collaboration. This issue is significant for future projects that seek to use this tool to bring together academicians and practitioners and generate external links. Table 6 summarizes the problems/issues identified as barriers to the success of the two schemes and recommendations for future projects that wish to introduce these platforms as a means to encourage dissemination, collaboration and participation of end-users and stakeholders in the project (some of these will relate to the forum in general and not just the end-user panel):

Table 5.6. Problems and recommendations.

Problems	Recommendations
Language barrier – while some problems can be easily dealt with this is a problem that may regularly come up in international projects.	In order to guarantee the use of the forum, reporting and data sharing should take place only through the forum thus assuring continuous use.
Data sharing and reporting – unless stated otherwise people will use other channels in order to share data	Setting up accounts – this should be done in the very early stages of the project and possibly done face-to-fact.
Lack of interest – as Carr (2008) described, with the shortening attention span and short time spent on any webpage it is increasingly difficult to maintain people's interest. In order to assure continuous interest the information must be relevant to that person or a requirement.	Forums and other groups (such as LinkedIn) should be utilized from the early stages of project thus enabling open-access and knowledge transfer from the early stages. This can also motivate end-users and stakeholders to participate and allow them to be more affective and not just bystanders.
	Open accounts with the end-users/stakeholders – similarly to setting up accounts and perhaps even more so, this should be done face-to-face to assure their participation in the forum and know-how on using it.
	Language barrier – while this may prove difficult it is up to the participating researches to serve as mediators.
	Forums must be user-friendly and set up to notify automatically whenever messages are posted.
	In groups such as LinkedIn the role of the researchers must be emphasized, demanding constant participation and involvement.

While the success of the forum and LinkedIn group in project SECOA is minimal, the knowledge acquired from this endeavour can be transferred to future projects. The problems raised here are not specific to this project and as reviewed in the literature, usage of the internet and social network (SNS) sites provide a platform for knowledge transfer but retaining interest and ensuring the proper use of the mediums is intricate. It is vital for research projects to adopt channels that allow the transfer of knowledge to practitioners and involve them in the various stages of the research. Using SNS such as LinkedIn or forums have made this an easier task and are beneficial for both academicians and practitioners.

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CHAPTER 6.

Citizen participation and awareness raising in coastal protected areas. A case study from Italy

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1. Introduction

In this chapter, part of the research carried out within the SECOA project (www.projectsecoa.eu) is presented. Attention is devoted to methods and tools used for supporting the participatory process in a case of environmental conflict related to the definition of boundaries of a coastal protected area: the Costa Teatina National Park, in Abruzzo, central Italy. The Costa Teatina National Park was established by the National Law 93/2001. Its territory includes eight southern Abruzzo municipalities and covers a stretch of coastline of approximately 60 km. It is a coastal protected area, which incorporates land but not sea, characterized by the presence of important cultural and natural assets. The Italian Ministry of Environment (1998) defines the area as "winding and varied, with the alternation of sandy and gravel beaches, cliffs, river mouths, areas rich in indigenous vegetation and cultivated lands (mainly olives), dunes and forest trees". The park boundaries were not defined by the law that set it up, and their determination has been postponed to a later stage of territorial negotiation that has not ended yet (Montanari and Staniscia, 2013). The definition of the park boundaries, indeed, has resulted in an intense debate between citizens and interest groups who believe that environmental protection does not conflict with economic growth and those who believe the opposite. That is why the process is still in act and a solution is far from being reached. In this chapter, the methodology and the tools used to involve the general public in active participation in decision making and to support institutional players in conflict mitigation will be presented. Those tools have also proven to be effective in the dissemination of information and transfer of knowledge. Results obtained through the use of each instrument will not be presented here since this falls outside the purpose of the present essay. The chapter is organized as follows: in the first section the importance of the theme of citizen participation in decision making will be highlighted; the focus will be on participation in the processes of ICZM, relevant to the management of coastal protected areas. In the second section a review of the most commonly used methods in social research is presented; advantages and disadvantages of each of them will be highlighted. In particular, the history and the evolution of the Delphi method and its derivatives are discussed; focus will be on the dissemination value of the logic underlying such iterative methods. In the third section the tools used in the case of the Costa Teatina National Park will be presented; strengths and weaknesses will be highlighted and proposals for their improvement will be advanced. Discussion and conclusions follow.

2. Citizen information and participation in public choices for coastal management

Citizen participation and search for appropriate tools for citizens' involvement in policy making is an important topic in recent scientific debate. Hanna (2000) sheds light on the issue of information and public participation as essential elements of integrated planning and public policy. Integrated planning implies the co-existence of social, economic and environmental concerns in decision-making. Integration is particularly difficult in coastal areas where the challenges to be faced in terms of contrasting uses are particularly difficult because of multiple jurisdictions, multiple users, and presence of scarce and fragile resources (Kearney *et al.*, 2007). Integrated planning also implies the interaction of policy makers with stakeholders and consideration of their claims in the final decisions. Hanna (2000) points out that integrated planning can be comprehensive (the decision-making process can include and make a synthesis among the various requests of the different players involved), but also strategic, that means not to be the synthesis of the different instances but contemplate, however, a collaboration and communication among decision-makers. We could define the former as a "strong" integrated planning and the second as a "soft" integrated planning. In the first case the element of participation prevails, while in the second that of information does; in both cases, a bottom-up process is accompanied by a top-down one. The first problem that arises, then, is to correctly identify the individuals – or groups of individuals – who should be involved in the informative-participatory processes. In an ideal world, all those whose lives may be affected by the decisions under discussion should be involved (Kearney *et al.*, 2007): this would be perfect democracy. But, how to do it in the real world? The second problem is that the way the information is collected and disseminated and the way stakeholders are invited to participate, is not neutral: they, indeed, respond to the system of values of those who put them in place (Hanna, 2000). But, how to reach neutrality in the practice? This poses a third problem concerning the relations of power among the players involved in participatory processes (Rockloff and Lockie, 2006). Doody (2003) stresses the crucial role of information and participation in the processes of Integrated Coastal Zone Management (ICZM). He considers information as a prerequisite for any decision-making process, and gathering information as a way to encourage and favour public participation. Doody (2003) considers awareness raising as the only way to build consensus and to reach a coastal management that would be truly integrated. He highlights the importance of citizens' involvement from the early stages of the process, as this is vital to create confidence and trust. Geskou (2003) considers participation as one of the three elements characterizing the public

policies for coastal management. She highlights how a real participation is difficult to obtain. She reports a success case (LIFE project, Magnesia, Greece), in which a participatory approach was followed; stakeholders were involved from the initial phases of problem identification and information collection, to the final phase of solutions' proposition. Poitras *et al.* (2003) emphasize the importance and difficulty of building consensus in Integrated Coastal Management (ICM) processes. Consensus is defined as the agreement reached among the different stakeholders involved at the end of a process of discussion, negotiation and participation. The most important problem to be addressed in a process of consensus building is linked to the difficulty of involving representative stakeholders in the negotiation process. This difficulty is due to four main reasons: (i) consensus building is new, it does not belong to the culture of the persons involved; (ii) there are few incentives to negotiate, stakeholders prefer legal solutions or are satisfied with the *status quo*; (iii) there is uncertainty about the success of the procedure, in how high are the risks of not getting results and; (iv) the apprehension of having to negotiate, due to the fear of being overwhelmed and to the unwillingness to put oneself on the same footing with other. Treby and Clark (2004) report only formal application of the principles of participation in the UK context. They stress that participation should not be only a way to lead to a shared decision but that the participatory process has a social value *per se*. According to Rockloff and Lockie (2006) the negotiation process brings a change in the understandings, perceptions, values and beliefs of the stakeholders. Treby and Clark (2004) point out, moreover, that specific cultures and sub-cultures of communities have an influence on the development of participatory processes; they, consequently, highlight the need to design *ad hoc* processes for each national culture and local community. Participatory processes should, also, take into account the different values, experiences, degrees of knowledge, receptiveness, awareness, social roles and economic positions of the stakeholders. There is a difference between simple consultation and participation, the first being just a top-down way to communicate alternatives and ask for comments. Simple consultation presents the risk that the experts take upon themselves the role of educating the community and find a peace between the community and the policy makers; this could correspond to what Arnstein (1969) defined as "manipulation". Treby and Clark (2004) emphasize that a limited participation is as negative as lack of participation; full participation is the way to define sustainable strategies. Rockloff and Lockie (2006) highlight that policy makers tend to include in participatory processes economic players who propose projects of environmental significance and to exclude associations, NGOs, indigenous people, based on the assumption that they are already represented by politicians and state agencies. The result is often

in solutions that reflect needs and interests of some stakeholders and not of the whole community, and therefore are not perceived as fair. In an ideal world, for each community and for each decision to be taken, a tailored process should be designed; it should involve all the local stakeholders, take into account all their needs and values; it should bring to integrated, comprehensive, strategic, holistic, shared, decisions and solutions.

3. Methods of social research

3.1. Classical methods of social research

3.1.1. Focus Group interviews

The focus group is defined as an interview style designed for small groups, with the aim to learn through discussion. It can be either a guided or an unguided discussion addressing a particular topic of interest to the group and the researcher. A small group of participants is under the guidance of a facilitator, also called *moderator*, who has to draw out information from the participants. It is a dynamic procedure, where interactions among and between participants stimulate discussion, and this has been described as the "synergistic group effect" (Stewart and Shamdasani, 1990). The main point is that a larger number of ideas, issues and solutions to a problem can be created through group discussion rather than through individual conversations. Just the energy that emanates from the group distinguishes focus group from more conventional face-to-face interviewing approaches. Focus groups have been used for many reasons: to investigate complex behaviour and discover how different groups think and feel about a topic; to understand why people hold certain opinions and suggest potential solutions to problems identified; to inform decision-making and strategic planning but also to add a human dimension to impersonal data. The focus group is useful to obtain detailed data about personal and group feelings and opinions. In respect to individual interviews it is for sure more convenient, both in terms of time and economically. In a focus group there is always the opportunity to seek clarification on the issue discussed.

However, despite these advantages and its many applications, many disadvantages have been highlighted in literature (Stewart and Shamdasani, 1990; Krueger and Casey, 2000; Acocella, 2012). Here are the most important:

- Often during the discussion emerge disagreements and irrelevant discussion which distract from the main focus;

- The discussion sometimes is hard to control and manage;
- The results are difficult to analyze and/or synthesize;
- Some participants may find a focus group situation intimidating, especially when there are situations of hierarchy;
- Participants may feel under pressure to agree with the dominant view, and this triggers the problems of groupthink and spiral of silence (see below);
- The moderator plays an important role during the discussion, but if the moderator is not experienced adequately, it is very easy for the whole discussion to be dominated by a few people;
- Focus Groups are artificial environment, i.e. people are collected in a room thus they might behave differently from how they behave when they are not watched, so the environmental context will affect the quality of research results;
- Since the idea of focus groups is to take advantage of group interactions, it is necessary to use the information at the group level. Consequently, the focus group is not a good instrument to find out valid information about individuals.

A particular version of focus group is the *online focus group*, where a moderator invites participants to log on into a predetermined conferencing software at a pre-arranged time. Like in classical focus group, the moderator guides the discussion. The main advantage of online focus groups is that it allows respondents from all over the world to gather, for a more representative sample. Other advantages are the lower costs and greater anonymity. The principal disadvantage of online focus groups is the absence of one of the main characteristic of the traditional focus group, namely the opportunity to observe interactions among participants. Of course, there can be technical difficulties and, above all, those who are less confident users of electronic devices may be less willing to participate. Moreover, in the online focus groups there are all the drawbacks that we have seen previously for the focus group.

3.1.2. Face-to-face interviews

The face-to-face interview is the most popular and oldest form of survey data collection, and is characterized by the fact that an interviewer is physically present to ask the survey questions and to assist the respondent in answering them.

The main advantage of the face-to-face interview is just the presence of the interviewer, a key figure that gives the respondent the possibility of clarifying answers or the meaning of the items of the questionnaire. In addition, a personal contact is a motivation source and the body language and reaction can guide the interviewer. With a face-to-face interview, we can use a variety of instruments, such as open-ended questions, answer scales, visual aids, etc.

Compared with mail and telephone surveys, face-to-face surveys has advantages in terms of the amount and complexity of the data that can be collected and in terms of data quality.

However, having recalled these advantages, we must keep present that there are also many disadvantages in this type of data collection. The main is the cost time and money, as budget constraints often limit the survey to a small geographical area.

The interviewer, on the one hand is the strong point of the face-to-face, but on the other hand can be an element of distortion. For example, he/she can give advice during the interview. To this, we must add that very often respondents might feel uneasy about the anonymity of their responses. With respect to the focus group, the face to face interview lacks the possibility to observe interactions about the discussion topic.

3.1.3. Online questionnaire

Given the downward trend in costs of computer hardware and software, the research in a variety of disciplines is taking advantage of online technology for conducting survey research. The instrument most commonly used for data collection is definitely the online questionnaire which, apart from the development of technology, has numerous advantages.

One advantage is that it takes benefit in providing access to groups and individuals who would be difficult, or not possible, to reach otherwise (Wright, 2005).

Another advantage is that online survey may save a lot of time. An online survey allows a researcher to reach thousands of people in a short amount of time and, moreover, it is possible to reach people geographically very distant to one another. Finally, online survey can also save money in respect to a traditional survey by eliminating the need for paper and other expenses, like costs for recording equipment, travel and telephone, and transcription costs.

However, even online surveys have quite important drawbacks, as for example the problems related to the sampling. In fact, you may know little about the characteristics of the respondents and, above all, there is no guarantee that participants provide accurate demographic or characteristics data.

Another important limitation is the so called self-selection bias, because it happens that some individuals are more likely than others to complete the online questionnaire, leading to a systematic bias. However, this problem is not unique to online survey research.

3.2. Alternative methods

3.2.1. The origins of the Delphi method

The Delphi method is a technique that uses responses (typically opinions) to a questionnaire by a group of experts or social actors to solve a problem, generally in a decision-making context and/or a forecasting framework. It is developed in a number of iterations, called *rounds*, during which the administrator who manages the process, called *facilitator*, provides statistical summaries of the answers given by all the members of the panel and the reasons for them. Experts communicate with each other anonymously and this aspect solves several problems typical of other methods of group decision-making.

One of the main objectives of Delphi is the convergence of opinions or the reaching of a solution shared as much as possible. The convergence of opinions should be seen as a process of structuring the communication that conveys more thoughts to solutions as possible shared.

There are several methods for the convergence of opinions but, for sure, the Delphi method is historically considered the founder. In 1952, the Government of the United States of America commissioned a group of experts to study the problem of a possible nuclear attack by the USSR. It is in this context that the method was born but only later, in the 60s, it took the name Delphi by the RAND Corporation - a research institute founded in 1946 with the financial support of the U.S. Department of Defence. The first Delphi study was commissioned by the U.S. government and concerned the application of expert opinions for selecting (from the point of view of a Soviet strategist) an American industrial target and the estimate of the number of atomic bombs necessary to reduce the American arsenal by a predetermined amount.

It is interesting to know that the name comes from the famous oracle of Delphi, and was coined by Kaplan, an associate professor of philosophy who worked for the RAND Corporation. According to the oracle principle, his prediction is not falsifiable, namely it is an assertion that has the property of being true or false.

Consider that the methodological alternatives available at the time of the Cold War to solve the problem of nuclear weapons existed and consisted of complex mathematical models that required an enormous amount of data, very long procedures, very sophisticated and expensive computers, and for these reasons, the RAND corporation chose to use the Delphi approach.

In the following years, however, those mathematical methods were applied but the surprise was that the results of the Delphi were better than those produced by sophisticated mathematical models.

This justifies, up to the many current applications, the use of a method that always remains very valid in all situations in which it is very difficult to obtain detailed data, or in cases where the mathematical models require subjective initial settings that the estimation results are heavily influenced by them.

Due to the peculiarity of the first experiment, it is clear that the method is diffused outside the U.S. defence only after several years, and this took place exactly in 1964 with a work of T. J. Gordon and Olaf Helmer entitled "Report on Long-Range Forecasting Study" (Gordon and Helmer, 1964). In that paper, published by the Rand corporation, the aim was to estimate the direction of a number of long-term trends, with particular emphasis on issues of science and technology, as well as on the potential impacts that the planned changes might have on American society and the world.

This publication together with another important work of Norman Dalkey and Olaf Helmer, which describes the methodological and philosophical foundations of Delphi (Dalkey e Helmer, 1963), are considered the basic literature for a large series of experiments of the Delphi method in the course of the sixties. During that decade, the Delphi started to be more and more present in the scientific literature and, in particular, aroused great interest within the aerospace and electronic technologies which were developing at very high speed.

The companies employed in those fields did large investments in research and development. In that context, the forecasts were vital for the planning and for the allocation of funds for research and development. Many researchers began to understand that the extrapolations of the trends of the time series were clearly inadequate for those purposes (Linstone and Turoff, 1975). As a consequence, the Delphi method became the main tool in the context of technological forecasting and has been used continuously until the present day.

At the same time, over the years, the need to exploit the subjective information derived from experts in the field of classical management, and in particular in the context of risk analysis, slowly emerged.

Thus, the Delphi appears in many different fields from those who gave it the light, such as the environment, health and transport. A method born in a particular historical context, that of the Cold War, to solve a very specific problem related to nuclear weapons, becomes in a few decades applied in various fields and by different organizations (businesses, governments and universities). The versatility of this method ensures that its applications are endless. Among the vast literature, here we suggest Brockhaus e Mickelsen (1975).

3.2.2. Description of the method

The Delphi method involves the repeated administration of questionnaires and provides both single opinions and the stimulation of a debate around the topic under research. The participants must be experts in the analysed issue, and form the so-called panel, with a cardinality varying from a few units up to fifty people, although in practice the groups are made up of about one or two dozen of participants. The size of the panel can greatly increase and rising the number of members involves an improvement in the quality of the results, even if it is not convenient go beyond a certain threshold, because obtained results improve slightly (Dalkey and Helmer, 1963). After defining the research topic, the first phase of Delphi concerns the choice of panellists. This is a very delicate phase, because it affects the final results, therefore it is recommended to build the panel as accurate as possible. Unlike the statistical sample surveys, in a Delphi it is much more important to choose the right people rather than to choose how many people to include in the panel. While in sample surveys it is assumed that the members of the sample are representative of a broader population and, above all, they are chosen randomly, in Delphi, on the contrary, we make use of individuals with special skills, not representative of any collective and selected in a non-random way (table 6.1).

There are studies that demonstrate the validity of the method independently from the number of the panellists, provided that the choice of experts is as careful as possible (Koch and Prügl, 2011). The panellists shall be selected on the basis of the so-called criterion of *expertise*: given the topic of the research, the participants must have a high knowledge of the studied topic but among them they must have different skills. For example, if the study regards the risk of earthquakes this can be addressed by volcanologists, geologists, sociologists, architects and so on. In this way the panel is composed of people with a wide range of knowledge, and this has the advantage of bringing different opinions on the same issue, with the aim of stimulate an exchange of views and knowledge.

Table 6.1. Statistical sample surveys and Delphi.

	Probabilistic sample surveys	Delphi
Selection of the units	Random	Reasoned
Features of the units	No specific characteristic	Expertise in the topic studied
Features of the sample/panel	Representative of a population	Non representative of a population
Size of the sample/panel	As wide as possible with respect to population size	It is decided according to the application
Expected results	Inference on the population	Convergence of opinions and/or debate on the issues discussed

The next step is an exploratory phase, and involves the construction of the first questionnaire to be submitted to the panel, made up of a series of open questions designed to bring out the points of view that, once collected, selected and organized by the researcher, will feed into the following questionnaires. Therefore, at this stage, the research topic is defined and a general problem framework is drawn, in order to precisely define the concepts and issues that will form the basis of the subsequent phases.

The analysis of the responses to this first questionnaire leads to the construction of a second questionnaire, which is administered to the experts in the so called "first round" of Delphi. These initial processings relate mainly the logical and terminological compactions, the elimination of redundancies and the creation of an exhaustive list of points needed in order to analyse the problem. Being self-administered, the questionnaire is delivered or sent to the participants. The delivery of the questionnaire by an expert of the method, if possible, is preferable because it allows, through a talk, to strengthen the motivations of the panellist and provide explanations on how to fill it.

Each expert of the panel will find in the questionnaire both part of his/her concepts (expressed in the previous exploratory phase), and those expressed by other panellists, who remain always anonymous throughout the procedure. In this way, everyone is able to reason about how other forms of expertise have acted in dealing with the problem under study, and this produces both a stimulus to the debate and a reflection on their beliefs that can begin, in whole or in part, to be changed. Consequently, a debate will develop (still anonymous) among the experts. The Delphi allows the creation of a process of communication among the participants, giving the participants the opportunity to express their opinions (expertise) and, at the same time, to review them in the light of the judgments of all the other experts, which are circulated in anonymous and aggregate form (*feedback*).

After the first round, the researcher conducting the survey summarizes the opinions expressed by the experts (Glenn, 2009), by means of statistical summaries. These results are used to build a new questionnaire, administered to the same panel of experts, during what is called "the second round".

The classic approach provides, as statistical summaries, the calculation of the first and third quartiles of the distribution of responses of the first round, resulting in an interval (called interquartile range) that contains 50% of the estimates. This interval represents a window of response during the second round of consultation.

The choice of the interquartile range is motivated by the fact that it contains half the evaluations made by the panellists, and is a valid approach for reaching a convergence of opinions. So, the second round sees the administration of the same questionnaire, but now enriched with synthetic information of the result of the first round (the interquartile range), thereby triggering the feedback process.

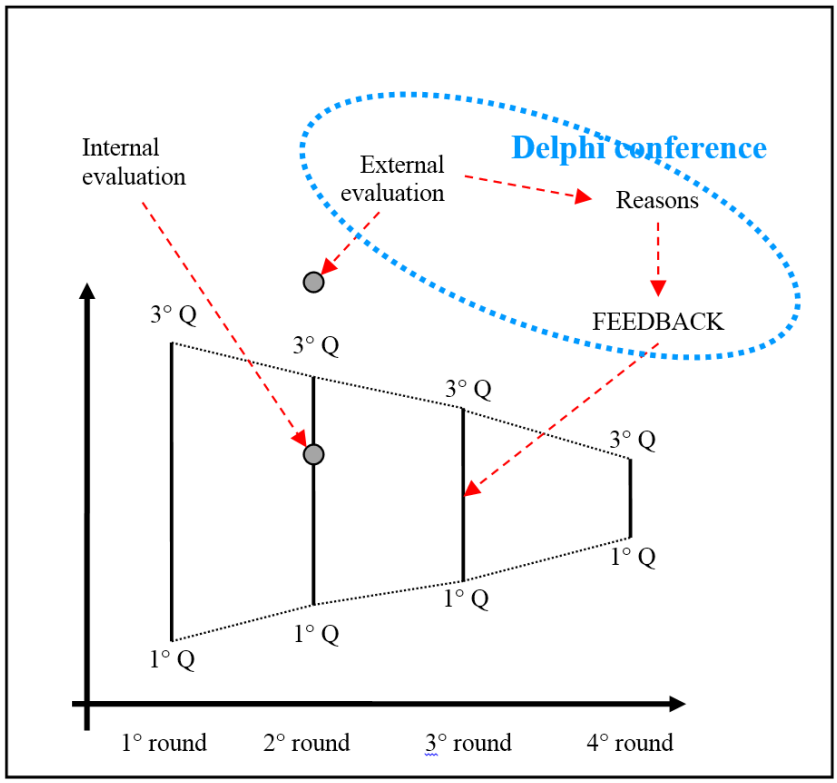
The question (or questions) proposed is always the same, but now each expert is asked to answer inside the window expressed by the interquartile range. In this way, if some experts revise their previous assessments to try to join the proposed range, already from the second consultation begins the process of convergence of opinions.

Inviting the participants to provide estimates within the interquartile range, does not mean to force them to limit their evaluations, but mainly ask those who want to give external estimates to provide written and anonymous reasons. So, if a participant wants to express an external evaluation, he/she is invited to give written explanations. These reasons trigger the so-called Delphi Conference, i.e. the anonymous debate leading experts to think about their previous estimates and, eventually, review their opinions.

The results of the second round are processed again, recalculating the summary statistics (first and third quartiles), so as to prepare the third round. Once again, the panellists are asked to answer the same question(s) trying to stay within the limits of the new interquartile range. Bu now, the reasons for external evaluation provided in the previous round are circulated, divided into arguments for lower evaluations and arguments for higher evaluations. Proceeding in this iterative way, the interquartile range narrows more and more, until it reaches a value small enough such that the convergence of opinions is considered sufficient (fig. 6.1).

Experts can then review their opinions in light of the reasons, provided anonymously, given by those who have remained outside the interquartile range. But, very important, they can also provide counter-arguments. Thanks to the circulation of reasons, starting from the third round begins a mechanism of "horizontal communication" which, though filtered by the facilitator, generates an anonymous conference, and it is in this sense that we speak of "Delphi conference" (Pacinelli, 1995).

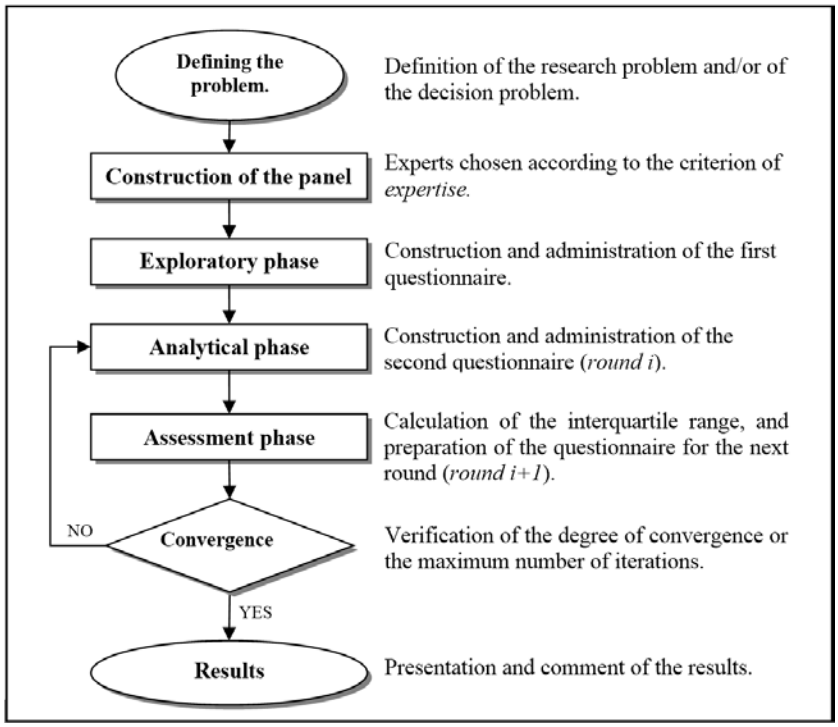
Figure 6.1. The process of convergence of opinions.



After a certain number of rounds (usually three to five), the researcher concludes the consultation and proceeds to the final elaborations of the results. The time between two rounds can be very short, but it would be prudent to extend these times so as not to force the participants to review their positions immediately after they are given. The whole procedure ends with the presentation and comment of the results obtained (fig. 6.2). The procedure ends when either the convergence is considered sufficient, or once you reach a certain number of rounds, fixed *a priori*.

Following, Figure 6.1 represents how the different iterations of a Delphi lead to a narrowing of the interquartile range and, therefore, to the convergence of opinions. After four iterations, the distance between the first and third quartile is much reduced, compared to the first round, and this means that 50% of the evaluations is concentrated in a sufficiently small interval. The figure also shows how the external evaluations, argued by the experts, trigger the feedback that stimulate the Delphi conference. The final result of a Delphi is, therefore, not only given by a final interquartile range, but also and above all by the debate which is created among experts during all the procedure.

Figure 6.2. The phases of the Delphi method.



The Delphi method offers several advantages when compared to other methods that allow a group communication, such as conferences, brainstorming, focus groups and so on. In short we can say that the benefits derive from the elimination of a series of problems, which we here call *errors*, inherent and inevitable in the other methods. Among the major errors that the Delphi avoids, we mention the following:

- *The error of leadership*: When the highest-ranking person in a group (e.g. in military, political, academic or corporate hierarchies) expresses his/her opinion, the others usually tend to follow him/her. Thus, the risk is that not everyone freely express their opinions for fear of coming into conflict with those who are higher in the hierarchy;
- *The error of the spiral of silence*: Those whose opinions reflect the ideas of the majority are more likely to feel confident in expressing their opinions; on the contrary those whose opinions are in the minority, fear that expressing their views will result in social ostracism, and therefore remain silent. Those perceptions can lead to a spiralling process, in which minority's viewpoints are increasingly withheld and, therefore, underrepresented;

- *The error of Groupthink*: It occurs when the pressure to conform within a group, interferes with the group's analysis of a problem and causes poor group decision making.Individual uniqueness and independent thinking are lost in the pursuit of group cohesiveness. When members strive for unanimity, their motivation to realistically assess alternative courses of action is affected. Therefore, the expression groupthink, indicates the situation in which, in order to minimize the conflicts and reach consensus for a decision, the individuals renounce to their ideas and opinions.

Ultimately, the Delphi method allows a set of people to give opinions around a problem as if they worked in a group, but without the effects of distortion (errors) generated by the simultaneous presence in the same place.

Most of the studies on this method have been carried out during the '60s and '70s, and has been proven as the Delphi is particularly suitable when the goal is to collect the informed judgments of experts, which have an expertise on a particular subject.

Since the procedure involves successive rounds, the researcher which conducts the survey may intervene at any time, to make adjustments and calibrate the procedure if necessary.

Although since its creation in the RAND Corporation many versions of the Delphi method have been invented and applied, we can say that the main steps of its basic version are those outlined above, and that we have schematically summarized in Fig. 6.2.

We can therefore say that the Delphi method, as well as other similar methods for the convergence of opinions, is characterized by three basic elements (Pacinelli, 2008):

- *The iterative structure*: (controlled *feedback*), the collection of the evaluations is carried out in several iterations, so that participants can review at least once their assessments after comparing them with the answers provided, in an aggregate manner, by other experts of the same panel;
- *The anonymity*, which prevents the association of the opinions to those who have expressed them, avoiding the errors arising out from hierarchical structures, leaderships or spirals of silence;
- *The asynchronous communication*, i.e. the possibility for the panel members to interact at a distance and at different times, without the simultaneous presence, thereby eliminating the pressures to decide quickly.

3.2.3. Criticisms of the method

The Delphi method has been criticized (especially in the 70s) from various points of view and, in the first place, it was accused of lack of scientific rigor. But, it has not yet been completely clarified why it should be methodologically less valid than other techniques such as the interview, the analysis of case studies or the life histories, which are widely used as instruments of investigation and policy analysis.

One of the main problems inherent in the Delphi, typical of all the methods that use panels, is given by the fact that during the various iterations it is almost inevitable that some participants abandon the analysis. Another disadvantage, which in part can be considered a cause of the previous one, is the long time that this method requires. Considering all the stages of preparation and administration of the questionnaires, a Delphi study with three rounds can last up to three or four months.

There is also a debate, which is still open, on the fact that in some cases the Delphi technique produces a convergence of opinions only because of the pressure that is exerted on the participants. So, it is as if they were "obliged" to reach an agreement, but such considerations certainly require a more thorough research (Rowe *et al.*, 1991; Woudenberg, 1991).

For sure, the method forces the participants with extreme opinions to a more difficult job than others, and this can sometimes lead to a change of opinion rather than writing the reasons for their extreme estimates (Linstone and Turoff, 2002).

Originally, all the research efforts on Delphi focused towards the achievement of consensus, because it was believed that the convergence of opinions among experts was certainly more accurate in respect to a single estimate. Over the years, however, the focus has shifted from the consensus toward the reasons that explain the "dissent". From the reasoning, it is possible to elicit very useful elements for the study, so that even if in a Delphi the convergence is not achieved, the analysis of the reasons and counter-reasons is always to be considered a useful result.

Since the technique is very simple to apply, it often happened in the past, and still happens, that the Delphi is used too superficially, without considering with due care the various aspects that may affect the results. Linstone and Turoff (2002) in this regard argue that just as there are researchers who have successfully tested the Delphi there are many who have had negative experiences in its use. In this regard, the same authors in the book "The Delphi Method, Techniques and Applications" list a number of reasons that are the basis of the classic failures in the use of a Delphi:

- the imposition on participants of views and preconceptions about the problem analyzed, through an over-specification of the Delphi structure which does not allow contributions from other perspectives;
- the wrong assumption that the Delphi is a surrogate for all other ways of communicating;
- the use of incorrect techniques to summarize and present the results of the survey, and the consequent difficulty of having a common interpretation of the rating scales used in the application;
- ignoring, instead of exploring, the extreme positions with the only result that the experts with extreme evaluations become discouraged and drop out of the panel;
- underestimate the fact that Delphi is a very tiring and requires energy from the experts, so they should be recognized as consultants and somehow rewarded for their work and the time devoted to responses (Linstone and Turoff, 2002).

Thus, we can conclude by saying that the criticisms of the Delphi are directed to the "manner" in which it was applied, rather than to the "method" itself. A Delphi applied incorrectly will not give good results, but if you follow carefully all the recommendations then it can be considered still a good method. Precisely for this reason, in recent times there is a considerable literature that has rehabilitated enormously the Delphi.

3.2.4. The Delphi from the 50s to the present day

The Delphi method has been so widely used that it is now considered the founder of a large variety of methods. We propose in this section a brief description of the most important methods that derive from it, following a chronological order.

After the article by Dalkey and Helmer (Dalkey and Helmer, 1963), Murray Turoff in 1970 proposed the *Policy Delphi* (Turoff, 1970), which is consensus-oriented and is used for the analysis of public policies. The panel is composed mainly of representatives from the community (administrative, political, economic, religious, etc..) and, in general, this method is used as a forecasting tool, a tool for decision-making aimed at finding innovative solutions and to the verification and refinement of consensus on objectives or alternative scenarios (Pacinelli, 2008). The panel should include actors which can influence, at least in part, the future on which they are asked to evaluate certain events. The Policy Delphi differs from Delphi because the panel is larger and more heterogeneous, and because the experts also give proposals and projects. Furthermore, other evaluation criteria than the mere probability are used, such as the desirability, the feasibility, the importance or the validity.

A different version of the Policy Delphi, called *Public Delphi*, is based on the participation of the citizens which want to participate voluntarily.

Soon after, in 1972, Olaf Helmer proposed the *Mini Delphi* (Helmer, 1972), a technique that speeds up the procedure as it is applied for face to face meetings, and in fact it is also known as the Estimate-Talk-Estimate method (ETE). In the first phase, each member of the panel responds in writing and, soon after, all the participants can view the resulting quartiles. This triggers a confrontation among the participants, which start to exchange opinions in the light of the findings. In a later phase, the panellists write new assessments independently to one another, in order to refine the estimates depending on the issues raised during the debate. The last step consists in the calculation of the medians of the answers given by the participants, which represent the final outcome of the consultation. Note that the Mini Delphi violates the rule of experts' isolation, and this could trigger the error of leadership, the spiral of silence or the error of group thinking. However, the main advantage in respect to Delphi is its greater speed and flexibility.

Two years later, in 1974, the theoretical foundations of a new method, the *Markov-Delphi*, were laid in a work of De Groot (1974). By tying the changes in the subjective evaluation of a predictor to a linear combination of the others estimates, this method provides important contributions in probabilistic terms. Moreover, the probabilities are collected in a stochastic matrix that governs a Markov Chain, assuming that all the panellists use, at all stages, the same probability law to change their opinions. According to this approach, the evolution of the matrix provides, at the limit, guidance on the convergence of the opinions. In the approach of De Groot each participant attributes weights to the evaluations of the others, which remain constant in each iteration, while Chatterjee (1975) studied an alternative solution, based on variable weights and Marbach (1980) proposed the adoption of weights that minimize the overall variance of the evaluations.

In 1975 Ford proposed the *Shang method* (Ford, 1975). Some characteristics of the Delphi method - such as the isolation of the participants (anonymity) - are kept in the Shang; moreover, the trouble of asking to rephrase the evaluations at each round is eliminated. The Shang method has the advantage of not anchoring the participants to a position and then, urge them to depart from it. After the selection of the participants and the definition of the problem under study, in the first Shang questionnaire experts are asked to express their opinions about a minimum and a maximum regarding the value to be estimated. The questionnaire has to be equipped with all necessary information and instructions for drawing it up. The first elaboration consists of the calculation of the arithmetic means of the minimums and maximums, which will form the constraints for the next round. As an alternative to the arithmetic mean it can be used other statistical synthesis, such as the "maximum of the maximums" and the "minimum of the minimums", or the "maximum of the minimums" and the "minimum of the maximums". The choice will depend on the type of application. Subsequently a central value between these two extremes is calculated. In the second round, each participant is invited to compare his/her

evaluation with the central value, simply answering "major" or "minor". If the number of "major" is greater than the number of "minor", the central value becomes the new minimum of a new range of variation. On the contrary, if there is an overriding indication on minor, the central value becomes the new maximum. So, a new central value is calculated and the method proceeds in an interactive manner until (as in Delphi) a sufficiently small interval is reached. It is evident that in each round the range of variation of the assessments is halved, and this makes the Shang much more fast that the classical Delphi.

In the same year the *Nominal Group Technique* (NGT) was also proposed. A problem-solving process that includes the identification of the problem, the generation of the solution and the final decision (Delbecq *et al.*, 1975). The technique can be used in groups of any size, who want to take decisions in a short time. This technique was created with the intent to exploit the advantages of both the methods in which the participants work in isolation (such as Delphi), and the techniques in which the members of the group interact. Initially, each member of the group provides an opinion on the proposed solution of the problem, accompanied by a brief description. Then, from the list of all the solutions you eliminate the duplicates. The members then proceed to build a list of all the solutions. At this stage, one or more facilitators encourage the discussion and the exchange of opinions with regard to the choices made by each member of the group, thus identifying a plurality of ideas and approaches. Sometimes the diversity of ideas leads to the creation of a hybrid idea, through the combination of two or more of the proposed solutions, which can be considered better than all other ideas initially proposed. After assigning scores to every solution, the solution with the highest total score is selected as the final solution. Even the Nominal Group Technique, such as the Mini-Delphi, implies the face to face meeting among the participants and the anonymity is limited to specific stages of the procedure when, in order to prevent the negative dynamics of the groups, it is necessary to exclude the verbal interaction. Therefore, the main drawbacks of the NGT are attributable to the failure to exploit the benefits of asynchronous communication and anonymity.

Proceeding, we come to 1979 when the *Decision Delphi* (Rauch, 1979) was born. It is a variant oriented to coordinate the decision-making processes of different actors, to the point of correspondence between prediction and action. In this method, the panel is formed solely with representatives of the institutions and its validity depends from the fact that the events may depend (at least in part) on the future behaviour of the participants. The validity of the prediction, in fact, also depends on the relevance of each single expert.

In 1986 the *Abacus-Delphi* seen the light; with the aim of simplifying the feedback, it uses the logic of the colours of the "Abaque" defined by François de Régnier (1986, 1987, 1989). A scale of colours measures the qualitative assessments of the experts. Green indicates a very favourable position, the light green quite favourable, the colours orange, light red and red indicate increasing

degrees of disagreement. The black indicates the will of not take a position and the white the inability to make a judgment. The main advantage of this Delphi variant is the simplicity of the responses, which makes the procedure faster than those using probability values, in this way also allowing the consultation of many experts.

During the 90s, although there were numerous applications of the Delphi and its many variants, there are no methodological innovations worthy of note.

We come then to 2006 when Theodore J. Gordon and Adam Pease proposed the *Real Time Delphi* (Gordon and Pease, 2006). The method, which is a computerized Delphi, does not provide for subsequent rounds and therefore leads to a greater efficiency in terms of execution time. Each participant can review his evaluations whenever he wants, while look at the aggregate results of all other participants. In fact, the statistical summaries of the responses given by all the participants, are calculated in real time and automatically updated and displayed on the interface each time an expert provides a new assessment. The Real Time Delphi is a Delphi conducted in the form of on-line questionnaire, but it should not be confused with a normal Delphi conducted on the web, which instead can be called *Internet Delphi*.

The main feature of the Real Time Delphi is that it does not imply specific rounds of iteration, but the process of evaluation, the calculation of statistical summaries, the display of results and revaluations, is continuous. The experts who are invited to participate receive a password to access the online questionnaire and, within a specified period of time (which can vary from a few days up to several weeks) have the opportunity to make their own assessments, write the reasons and re-evaluate whenever they deem it appropriate. The statistical summaries (median, averages or quartiles) are automatically calculated each time, therefore each participant is able to see, in real time, the extent to which its previous assessments remain inside the interquartile range or near the median. So, the main innovations of this method are the real-time calculation of the statistical summaries and the absence of iterations. These elements allow carrying out studies on a large-scale, giving the opportunity to reach experts in any part of the world, and to perform everything in a short time. In order to give the experts the opportunity of written arguments, for each question there is a button that opens a special window, which lists all the comments provided up to that moment, and where the expert can add his/her own point of view. In this way, for each question, together with the average or quartiles, a list of comments is gradually formed, which is very valuable for research purposes. Given that in general in these questionnaires there are several questions (sometimes up to 50 or above) the participant is given the opportunity to abort the compilation at any time, saving the given answers. When the expert decides, it can come back on the questionnaire, continue the compilation and/or revise the previous assessments. This produces another advantage, because unlike the classic Delphi

questionnaires, it does not compel the respondent to complete the entire questionnaire in one sitting and, above all, by a deadline. In other words, the expert feels free to respond also to a part of the questionnaire, to re-evaluate only some of its assessments, to choose the sequence of questions to be answered and, above all, to do it when it sees fit.

A recent innovation among the methods derived from the Delphi is the *Spatial Delphi* (Di Zio and Pacinelli, 2011). Since in many applications there is a problem related to the territory, Di Zio and Pacinelli (2011) have introduced an interesting innovation: when a decision problem involves the choice of a place where a future event may happen, it may be useful to use a panel of experts to identify an area small enough, where the event will occur. The Spatial Delphi is based on the replacement of some of the basic elements of the classical Delphi with analogues that are spatial. After defining the research problem and built the panel, the experts are asked, in the first round, to locate a point on a map (called *opinion point*), denoting the place where it is more likely the occurrence of a future event (for example, in their work the authors have made an application on earthquakes). The result of the first round is represented by a cloud of points in a given territory. On this cloud is calculated a circle, which contains 50% of the opinion points provided by the experts, therefore, the circle is the analogous, in the space, of the interquartile range. In the second round it is asked to the experts to relocate their points, but try to stay inside the circle, as in the classic Delphi is asked to remain in the interval between the first and third quartiles. Anyone wishing to place a point outside the circle can do it, but must provide a written explanation, in order to trigger the Delphi conference. After the collection of the second cloud of points, a new circle is calculated and, as in the classical Delphi, the procedure is repeated for a number of rounds, until you get to a final circle (called the *circle of convergence*) small enough to consider the survey ended.

Among the advantages of this method is the fact that the positioning of a point on a map is quick and intuitive, so does not forces the participant to make complex reasoning and cognitive elaborations on the question asked, as happens instead in a classical questionnaires. In the basic version the map is on paper, but in a more advanced version the authors propose a digital map (built by means of a Geographic Information System - GIS), which, therefore, can be sent via web to panellists, greatly reducing the execution time of the survey. In the application on the earthquakes (Di Zio and Pacinelli, 2011) it was found a dropout rate practically zero, so the authors think that the ease in providing answers on a graphical and intuitive interface, reduces or eliminates at all the classic problem of abandon, typical of many Delphi methods.

As a future evolution of this method, it is under study the possibility of integrating the idea of the Spatial Delphi with the logic of the Real Time Delphi, in order to exploit the advantages of both methods. The points on the map can be moved several times, by the same

expert, and the circle of convergence is recalculated (i.e. moved and resized) each time a new point is inserted on the map. This would lead to the development of a new method that can be called *Spatial Real Time Delphi* (Di Zio, 2012).

The last of these Delphi-derived methods is the *Spatial Shang* (Di Zio and Staniscia, 2014). It is a modified version of the Shang method, starting from the assumption that the convergence of opinions involves a spatial context in many applications, like in the Spatial Delphi. The Spatial Shang is based, like the classical Shang method, on judgments of a panel of experts, but is applicable when consultations and consequent decisions concern matters of spatial location. The experts are first asked to draw four points on a map while, in subsequent rounds, each panellist must locate a single point, representing her/his evaluation, in one of four rectangles drawn on the map. The rectangles come out from the identification (like in the classical Shang) of minimums and maximums, both in the sense of longitude and latitude, and from two dividing lines identified through the calculation of two central values, one for longitude and one for latitude. The Spatial Shang has the advantage of being easily accessible and understandable, even for a non-specialized audience, therefore, can be used both with a panel of experts and with a panel of non specialized stakeholders. Like in the Spatial Delphi, the simplicity of the responses reduces enormously the total time of the survey. In a nutshell, we can say that this method combines the advantages of the Spatial Delphi with those of the Shang's,

In Table 6.2 we show schematically the list of the various methods discussed previously, together with the main reference.

Table 6.2. Chronological evolution of the methods Delphi-derive.

Method	Reference
Delphi	Dalkey N., Helmer O., 1963
Policy Delphi	Turoff M., 1970
Mini Delphi	Helmer O., 1972
Markov-Delphi	De Groot M. H., 1974
Shang	Ford D. A., 1975
Nominal Group Techn.	Delbecq A., Van Da Ven A., Gustafson D., 1975
Decision Delphi	Rauch W., 1979
Abacus Delphi	Régnier F., 1986
Real Time Delphi	Gordon T. J., Pease A., 2006.
Spatial Delphi	Di Zio S., Pacinelli A., 2011
Spatial Shang	Di Zio S., Staniscia B., 2013

3.2.5. Integration with other techniques

An interesting aspect regards the integration of these methods with other methods typically used in a decision-making context. For example, some authors have integrated the multi-criteria technique called AHP (Analytic Hierarchy Process) and the Delphi (Tavana *et al.*, 1993; Di Zio and Maretti, 2013). While Delphi seeks a convergence of opinions among a group of experts, the AHP helps to solve complex decision problems using a hierarchical structure. To integrate the Delphi and AHP methods, Di Zio and Maretti (2013) propose an innovation in the way the feedbacks are circulated among the participants. The experts' judgments are given in a box-plot using a slider, which simplifies the procedure because the respondents have all the most important information on the distribution of responses from the previous round.

When dealing with HAP in a group of experts, one of the main problem is the method of aggregation of the individual assessments. Saaty (1983) describes the advantages of using the AHP in a group setting, which are: a) AHP-based group decision processes can include tangibles and intangibles values and individual and shared values; b) By structuring the discussion, every factor relevant to the decision is considered in turn; c) By structuring the analysis, the discussion continues until all relevant information from each participant in the group has been considered and the choice of the decision alternative is achieved, and; d) In a group context, the discussion can be focused on objectives rather than alternatives.

The main problem when applying the AHP in a group context is that it is necessary to proceed to an aggregation of the individual assessments. Wu *et al.* (2008) summarize the most commonly used techniques. A) Calculate the AHP weights for every expert and then compute the final weights using the arithmetic mean. B) The judgements of each expert are aggregated by the arithmetic mean, and then the AHP weights are calculated. C) The judgements of each expert are aggregated by geometric mean, and then the AHP weights are calculated. The first method is the aggregation of individual priorities (AIP), while B and C are both in the class of methods with aggregation of individual judgements (AIJ) (Wu *et al.*, 2008).

When applying the AHP procedure, the achievement of a consensus of group members in making judgements, or in defining the alternatives, is usually sought when all the members engage in face-to-face and this is a typical aspect of any work group decision. But, as known, often a consensus is difficult to reach, and one possible solution is to vote on each judgement (Lai *et al.*, 2002). However, the group is sometimes unwilling to vote, and, this is a big problem. Though, even more importantly, the majority vote mechanism is not a good choice because, as explained by Saaty and Shang (2007) it "is a winner-take-all outcome". This means that following a vote, the majority

determines the final decision of the group and the minority must unconditionally compromise its position. In other words, the preferences of the losers are not considered important, and are not taken into account at all. This is the reasons why the aggregation of the individual assessments is often achieved by using either the AIP or the AIJ procedures.

Nevertheless, the aggregation methods are all based on averages, which have well known drawbacks, because they do not consider the variability of the judgements within the group. Di Zio and Maretti (2013) explain this point with an example. In a situation A where all the participants evaluate an alternative in the same way and a situation B where the group is divided into two parts, with evaluations contrary to one another, an arithmetic mean provides the same value for both A and B. It is evident that the two situations are completely different, and in particular the variability in the two cases is diverse. We can also say, in other words, that the AIJ and AIP methods provide a synthesis of the judgements but not a consensus. So, the problem of how to aggregate individual judgements into a single representative judgement is solved, but the different opinions of the individuals are not taken into account.

Sometimes, in a group decision context, it is important to find a solution that is shared as much as possible, therefore other methods of aggregation are needed. For this reasons, in literature has been proposed the Delphi method (Tavana *et al.*, 1993; Di Zio and Maretti, 2013).

Instead of using the vote mechanism, or the aggregation techniques, it is convenient to perform a certain number of Delphi rounds to reach a consensus on the judgements of the AHP pair wise comparison matrix. This procedure eliminates the drawbacks of the vote and the problem of the choice of one of the diverse aggregation methods, which are necessary when the AHP is applied in a group setting. It has been demonstrated that, when it is important to find a solution that is as much shared as possible, this methodology is better than the aggregation methods. The drawbacks of the method are given by a combination of the disadvantages of both Delphi and the AHP. Predominantly, the several rounds required by the Delphi and the fact that the AHP, even with few alternatives and criteria, produces a considerable amount of evaluations.

3.2.6. The Delphi as a Dissemination tool

In agronomy, before sowing, a phase of working the land takes place, which is currently made with machinery, with the aim of creating a hospitable environment for the seeds. The process has the purpose of improving the conditions, both physical and mechanical properties, of the soil. In particular, it tends to increase the softness and the permeability of the soil, creating ideal conditions for promoting the expansion of the roots and water infiltration. If the term "dissemination" has a root that comes from the "seed", then it is important the preliminary stage of "preparing the ground"; in order to sow well you

have to first prepare the ground well. The Delphi, and Delphi-derivate techniques have a very important valence in this regard. In fact, the various iterations of the Delphi have a value that goes beyond the simple fact of "change opinions".

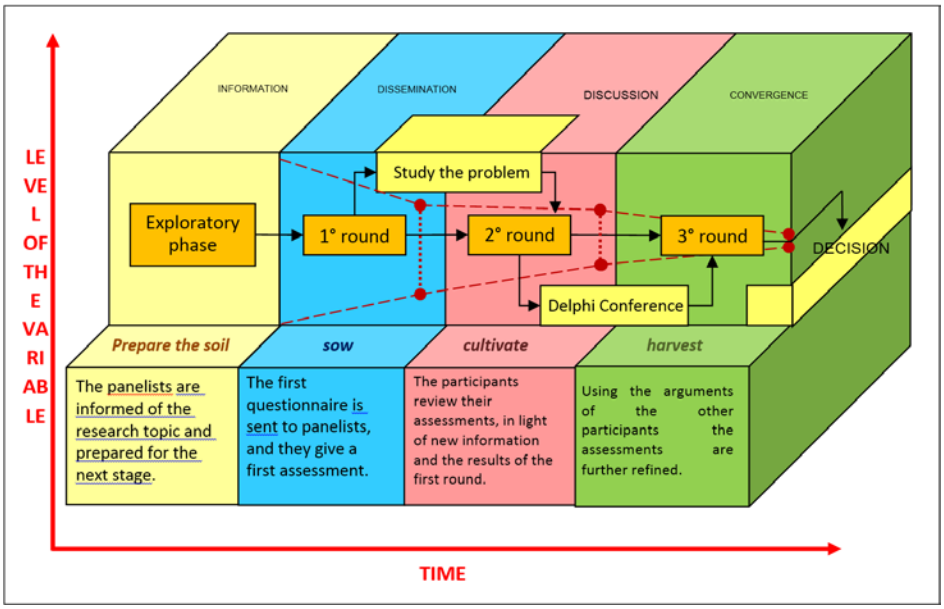
In the exploratory phase, the various points of view of the participants are collected and a general framework of the research problem is outlined. In this way, the panellists are informed on the research topic and they are prepared for the next stage. In other words, it is like "preparing the soil for sowing".

After, in the first round, the subject of the study is explained to participants, and they give a first assessment. During the time elapsed between the first and second round, participants go in search of information, because (whether experts or not) they are inclined to study the latest developments in the subject matter. In fact, when they change their opinions, very often is not because they are not convinced of their first assessment or because they are forced, but because in the meantime they have acquired new knowledge on the research topic, and also because they receive feedbacks from the exploratory phase. This is like sowing.

After the second round, in addition to the study done by themselves between the 1st and 2nd round, the participants also gain arguments from other panellists, that are circulated anonymously: here the Delphi conference starts.

In practice, the early stages of a Delphi can be compared to the preparation of the soil and the dissemination. Therefore, we believe that, given a certain research topic, the Delphi, can be thought of as a dissemination tool (fig. 6.3), due to its iterative nature.

Figure 6.3. The Dissemination valence of the Delphi.



4. Tools for raising participation and mitigating conflicts in the Costa Teatina National Park

The environmental conflict involving the Costa Teatina National Park dates back to the year 2001, when the Park was legally instituted. It became more acute, urging a solution, when the problem of defining its boundaries was posed. The local debate has been going on with some phases which have aroused very high interest and attention.

During the two-year research period, several activities were implemented and developed in order to support citizen participation and involvement, awareness raising, and conflict mitigation. Those activities included: (i) direct and constant contacts with local stakeholders, (ii) publication of articles in local newspapers, (iii) active participation in a public conference, (iv) definition and implementation of the *Spatial Shang*, (v) development of explanatory maps, (vi) ideation and implementation of a video, (vii) preparation of a webpage, (viii) preparation and implementation of an online questionnaire.

4.1. Contacts with local stakeholders

The involved stakeholders were contacted and interactions have been developed in several ways. The first contacts were taken *via* attendance in seminars, workshops, and conferences locally organized. Those initiatives provided opportunity to personally interact with a wide audience. After those preliminary, informal contacts, the local stakeholders were contacted in order to investigate about their positions towards the ongoing conflict. This was done with an explorative purpose, and it was useful for the conflict analysis. The second step, implemented only with some of the stakeholders, consisted in an active collaboration with them. The collaboration had the aim of raising awareness among the citizens about the national park issues and of getting support in the implementation of the *Spatial Shang* (cfr. below) and the online questionnaire (cfr. below).

4.2. Publication of articles in local newspapers for public awareness raising

Several months were invested in field research. The publication of popular articles in the local press (*il Centro*, the most widely read regional newspaper) was a way to directly intervene in the debate concerning the park that was, in that period, a very important topic, intensively discussed. The articles had the purpose of making the general public aware of the ongoing conflicts; they also aimed at making the arguments used by the stakeholders involved in the conflicts to be

clearer for a non-specialized audience. The impact of the articles was high and stimulated the direct reaction of some of the public players; the Regional Minister for Agriculture – in charge of the coordination of the activities for the definition of the park boundaries –, for instance, intervened in the debate hosted by *il Centro* (Febbo M., 14.09.2011) as a reply to the article published by Montanari A. (13.09.2011) (fig. 6.4).

Figure 6.4. Article published by Montanari, A., il Centro, 13.09.2011.

LA RISORSA DEL PARCO

di Armando Montanari

In questi giorni in cui le posizioni dei comuni interessati vengono confrontate con quelle della Regione e dello Stato è inevitabile pensare ad uno dei principi che sovrintendono alla protezione dell'ambiente almeno dall'inizio degli anni novanta quando si è introdotto il concetto di sviluppo sostenibile. Si tratta del principio della sussidiarietà e della condivisione delle responsabilità. I Comuni sia quelli favorevoli che quelli contrari al Parco devono essere ascoltati ma ciò non può essere considerato un processo esclusivo. L'Unione Europea per esempio, per tutelare gli interessi di tutti i suoi cittadini, si propone di conservare la diversità biologica nel nostro Continente all'interno e intorno ad habitat naturali. E ciò anche attraverso il restauro e il mantenimento degli habitat e dei territori di passaggio dall'uno all'altro. Nei documenti fondanti della UE si fa anche chiaramente riferimento a mantenere e a migliorare la bellezza del paesaggio e delle zone non costruite intorno alle aree di maggiore protezione e per questo vengono chiamate le amministrazioni nazionali, regionali e locali.

(Segue a pagina 10)

Euro 1,00 • Anno 26, n. 252
Martedì 13 settembre 2011

SEGUE DALLA PRIMA

LA RISORSA DEL PARCO

Le imprese, i proprietari e gli agricoltori ad adoperarsi al conseguimento di questo obiettivo. I giorni scorsi dall'Abbazia di San Giovanni in Venere con un mio fraterno amico di Casalbordino guardavamo verso il mare e ci chiedevamo come era possibile che quella amministrazione comunale non ravvisasse la necessità di tutelare tale bellezza e che non si ritenesse importante quella continuità di natura, storia e di cultura che univa tutto il territorio compreso dalla cima della Maiella al mare.

Un ricordo importante della nostra gioventù è tuttora il viaggio in treno lungo quella ferrovia costiera che non esiste più e che attraversava in certi tratti un paesaggio stupendo di aranceti e oliveti. Cosa lasceremo alle future generazioni? Quale la nostra responsabilità per la vita, la salute e la cultura dei nostri figli? Abbiamo ereditato un patrimonio e lasceremo loro solo un po' di cenere? Il successo di uno sviluppo durevole e sostenibile dipende in grande misura dalle decisioni, dalle azioni e dall'influenza che l'opinione pubblica è in grado di esprimere. Per questo però è necessario che vi sia una strategia globale per informare il pubblico. Ciascun individuo può operare scelte razionali e in piena cognizione di causa a condizione di poter disporre di tutte le informazioni relative al rendimento, all'affidabilità, all'efficienza, ai costi di ciascun intervento. Tali informazioni devono però essere espresse in modo chiaro, ma anche neutro, e contengano garanzie reali e attendibili.

I principi sulle aree protette che vengono condivisi a livello internazionale attraverso le Nazioni Unite identificano nei Parchi Nazionali aree gestite principalmente per la protezione degli ecosistemi e a fini ricreativi. La aree vengono designate per proteggere l'integrità ecologica degli ecosistemi per le generazioni presenti e future. Ma anche per escludere lo sfruttamento delle risorse e fornire una base per le opportunità spirituali, scientifiche, educative, ricreative che comunque devono risultare compatibili con l'ambiente e la cultura. Qualche tentativo di disinformazione ha cercato di introdurre un elemento di contrasto tra la tutela e lo sviluppo turistico. Come se per fare turismo sarebbe necessario non tutelare il territorio. Eppure il turismo nelle aree protette, comunemente definito ecoturismo, comporta un uso delle risorse a basso impatto per l'ambiente e per la comunità locale. Contribuisce ad aumentare la consapevolezza e la comprensione dei sistemi culturali e naturalistici per coinvolgere i visitatori, massimizza la partecipazione preliminare e di lungo periodo della comunità locale nei processi decisionali, indirizza verso la comunità locale tutti i benefici che devono essere di complemento alle attività tradizionali come l'agricoltura, la pesca e i sistemi sociali.

Sulla base della ricchezza delle risorse naturali e culturali la ricerca "Solutions for Environmental Contrasts in Coastal Areas (Secoa)" finanziata dalla Commissione europea per il periodo 2009-2013 ha identificato nel Parco della Costa Teatina un elemento di interesse primario per il riconoscimento dei valori dell'ambiente e della cultura nelle società avanzate.

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In the three articles (Montanari A., 25.08.2011; Montanari A., 13.09.2011; Staniscia B., 10.03.2013) the SECOA project, its methodology and its aims were presented, and the issue of environmental conflicts in coastal areas was introduced; the concepts of sustainable development – and its three pillars –, of subsidiarity, of collective responsibility were evoked; the idea that the protection of landscape, biodiversity, ecosystems have an international (not just national or local) importance was evidenced, as much as the role of the European Union in this matter; the importance of providing a transparent, neutral and correct information to citizens in order to allow a fair and aware decision-making process was highlighted; the history of the Costa Teatina National Park was recalled, national and international comparisons were proposed; the concept of zoning was introduced, the possible interactions with other regional parks were explained as much as the possibilities offered by ecotourism.

4.3. Participation in the public conference "Parco e Territorio. La strada dello sviluppo"

SECOA team members[1], were invited to participate and intervene with structured presentations, in the public conference "Parco e Territorio. La strada dello sviluppo" (Fig. 6.5) organized by one of the local political parties (Democratic Party) with the aim of raising awareness about the park's related issues.

Given the scope of the conference, the presentations provided information about protected areas and natural parks, and the conflicts potentially linked to their presence; besides, the SECOA project methodology and preliminary results were presented, including the *Spatial Shang* method (cfr. section 3.2.4. and subsection 4.4. below). Attention was devoted to international and national examples of natural parks, to ecotourism and wine-and-food tourism connected to cultural heritage as potential resources for local natural parks; the history of development of the region was also explained.

[1] Montanari A.: http://www.youtube.com/watch?v=UBy0yeA9oJo;
Staniscia B.: http://www.youtube.com/watch?v=0wHwAf8o2eU;
Di Zio S.: http://www.youtube.com/watch?v=LHI_Bopmi88.

Figure 6.5. Conference poster, Fossacesia (Costa Teatina National Park) 2011, July, 29th.

The conference was addressed to a wide audience and more than two hundred persons participated. The presentations received appreciation and criticism by some of the participants. These latter were strongly opposing the park's existence and, thus, trying to exacerbate the conflict. Democratic Party, the conference organizer, is, officially, in favour of the park's existence. In within the party there are heterogeneous ideas about the park boundaries. The conference had the aim of making the citizens aware and informed about the park issues. The conference was opened to the general public, the entrance was free.

Many were the active participants and the debate that followed the presentations was very vivid. Some of the participants had their *a priori* ideas and did not participate to get information but to express their protest. Many of the participants, on the contrary, participated with the aim of improving their knowledge about the park.

4.4. Spatial Shang as a tool to facilitate the boundary definition

A special tool was developed, the *Spatial Shang*, in order to support decision making about the delineation of the limits and to mitigate the conflicts. The *Spatial Shang* is an *ad hoc* tool, customized to deal with the specific issue of defining the Costa Teatina National Park boundaries (Di Zio and Staniscia, 2014).

The *Spatial Shang* was used as a tool to support local stakeholders in the decision process and it was able to guarantee the convergence of their opinion. The spatial problem that was posed to their attention concerned the definition of the park boundaries or, alternatively, the definition of a territorial buffer small enough to later define the boundaries.

Sixty-two representatives of all the stakeholders, representing the whole community from different perspectives, being able to give voice to a plurality of opinions and interests, were involved in the process. They represented local public bodies (mayors, city and provincial councillors), national institutions (MPs), political parties, the church (parish priests and representatives of the bishop's court), trade unions (general secretaries of the provincial bodies), entrepreneurs and producers' associations (in the agriculture, handicraft, commerce, tourist sectors), entrepreneurs operating in the environmental field and in the third sector, citizens' associations and NGOs, environmental and cultural associations, local media, local development agencies, schools and universities.

Three main criteria guided the stakeholders' selection process: (i) had a deep knowledge of the territory and were aware of the on-going conflicts; (ii) had the capacity to represent a clear and transparent position in the conflicts; (iii) had the ability to give voice to the general interest of the specific category they represented.

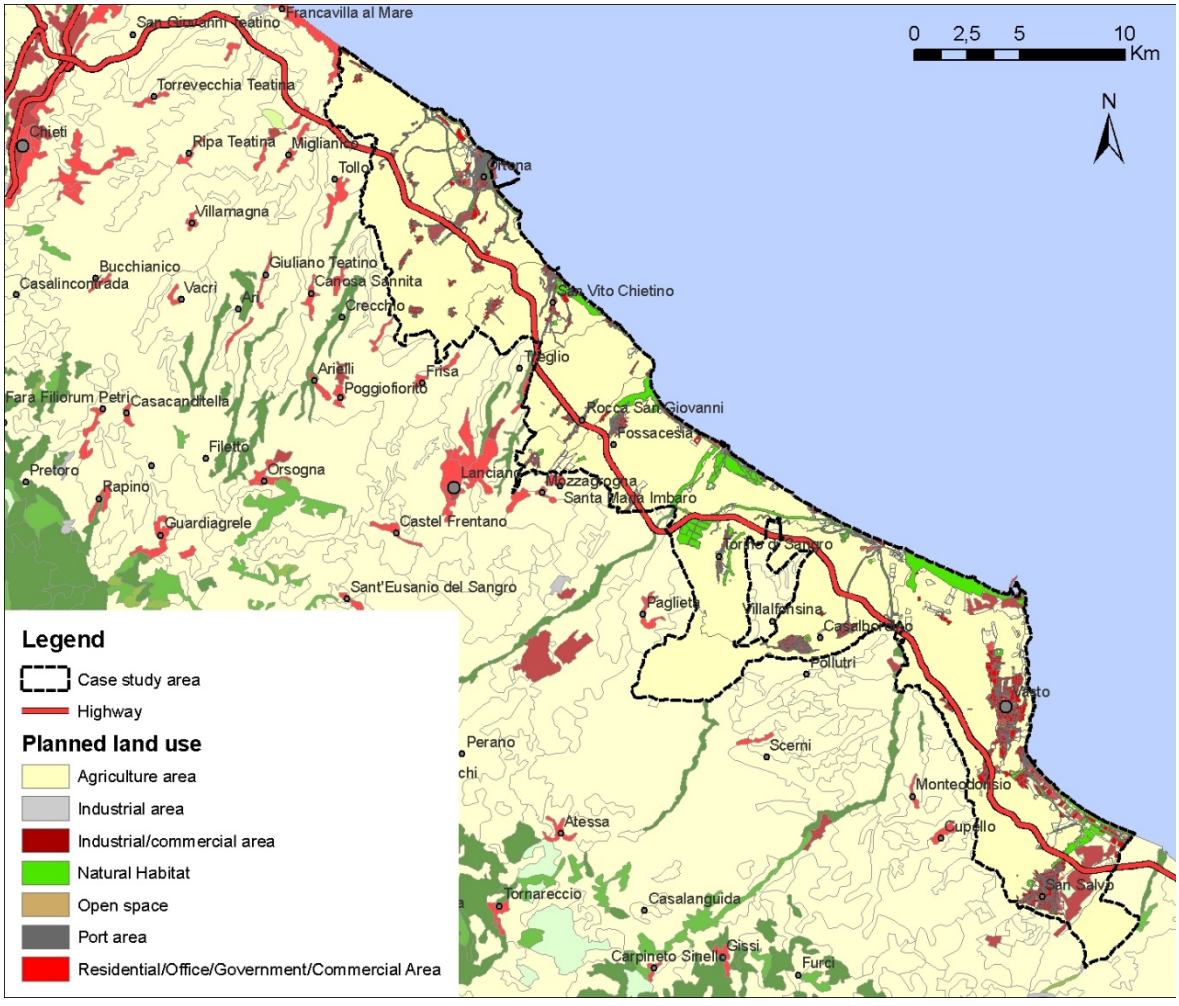
Since the problem of the park boundaries could be reduced to the definition of a line at a certain distance from the shoreline (more or less parallel to the coastline), the *Spatial Shang* could be reduced to one spatial dimension in its application. Given that the Adriatic coast extends from north to south, the analysis was conducted only in the direction of the longitude (East-West) (Di Zio and Staniscia, 2014). Operationally, the *Spatial Shang* was conducted by submitting to the local stakeholders maps (fig. 6.6) on which they could locate their choice for the park limits. There were two iterations that brought to the convergence of the experts' opinions.

Figure 6.6. The map used in the second iteration of the Spatial Shang.

4.5. Maps with alternative development scenarios

Maps of the area showing different development scenarios for different alternatives for park boundaries, were prepared (SECOA D4.3, 2012). The three proposed scenarios were: business as usual, development-based scenario (Fig. 6.7), and nature-based scenario. The maps showed the land use change in the alternative situations. They have been used as a support during the contacts with the stakeholders and in their participation in public events. The "business-as-usual scenario" was built through a projection into the future of the land use changes that had occurred in the past, since the year 2000; the "development scenario" was built taking into consideration the planning tools operative in the area at the time of the research; the "nature-based scenario", was built taking into consideration the two alternative park boundaries, previously defined through the *Spatial Shang*, and the only proposal for the park zoning existing at the time of the research.

Figure 6.7. Map of the land use changes in the "development" scenario.



4.6. The video

Furthermore, a video[2] was produced, in order to present the SECOA project and to make the general public aware of the ongoing conflicts. The video has been prepared by researchers with the collaboration of communication specialists, technicians and actors. The video is in Italian and is on line. It has been, so far, viewed by 293 users.

The video introduces the Costa Teatina territory using images and maps. It explains the importance of natural and cultural resources characterising the region (olive groves, ilex wood, Cistercian abbey) and some peculiarities like the "trabocchi", light temporary structures on the sea rocks, once used for fishing, today used for tourist purposes. In the video, a reference is made to Gabriele d'Annunzio (1863-1938), a famous Italian poet, who was born in the region and who was spending time in the Costa Teatina territory in his adult age. There are several, specific, references to that territory and to the "trabocchi" in d'Annunzio work. The video explains the origin of the Park and summarizes its recent history in highlighting the on-going conflicts and the different interests of the local stakeholders.

4.7. The webpage

In cooperation with one of the most active citizens' associations (Nuovo Senso Civico), a webpage[3] (fig. 6.8) has been created to be used as a tool to inform citizens about the ongoing conflicts, and their possible solutions. The webpage is in Italian and contains: (i) a presentation of the SECOA project, (ii) the above-mention video, (iii) the online questionnaire (described in detail below, in this section).

[2] http://www.youtube.com/watch?v=xBVf2Qp_9Zo

[3] http://www.nuovosensocivico.it/secoa/index.sp

Figure 6.8. The main webpage.

4.8. The online questionnaire

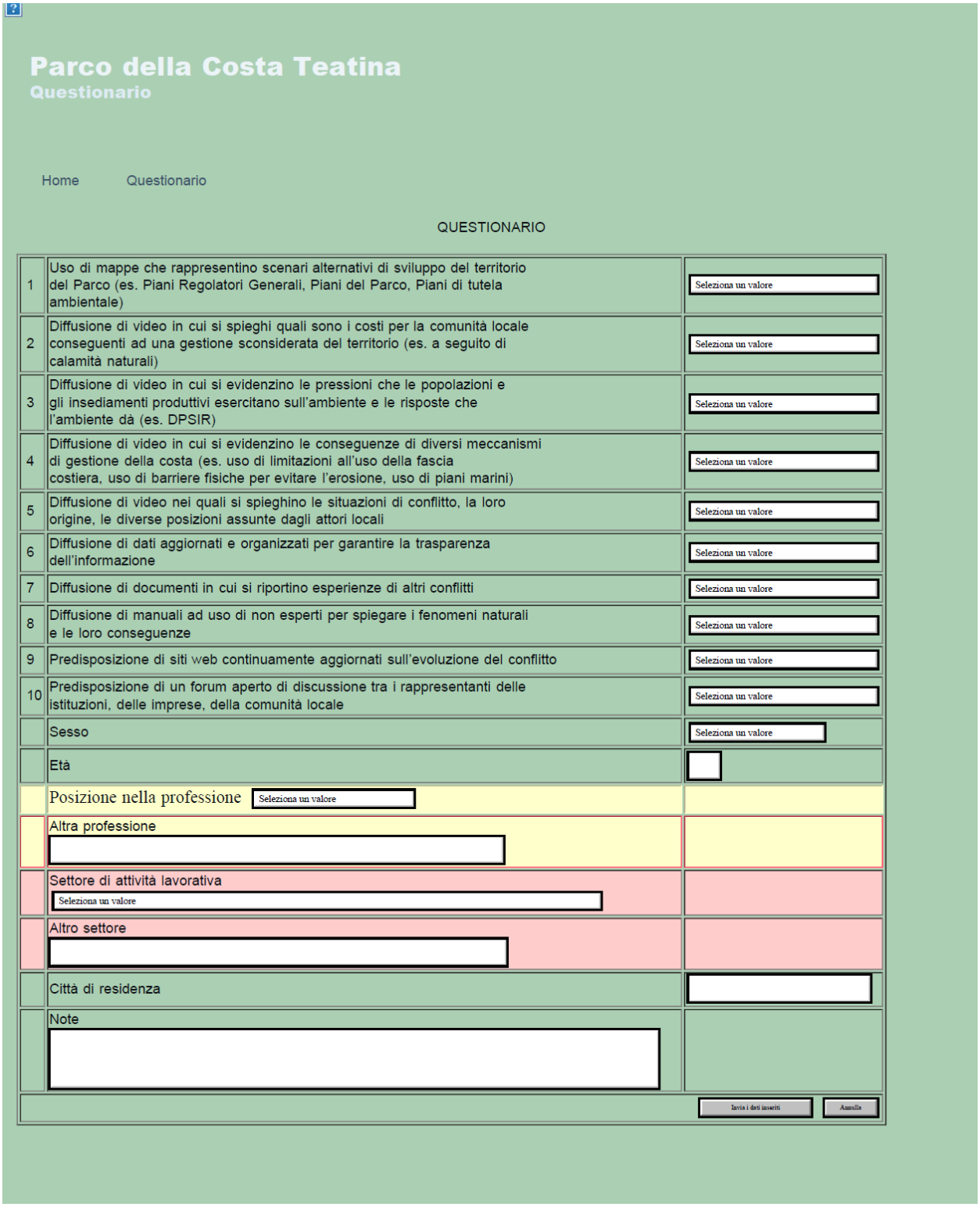
With the support of one of the most active citizens' associations (Nuovo Senso Civico), an online questionnaire[4] (fig. 6.9) was prepared. The association has its own website and a blog. The blog has got 100,000 contacts during the year 2012. This provided the opportunity to reach a large audience even though - given the association's inspiring principles - strongly characterized by a focus on environmental protection and landscape. This aspect was taken into account when the results of the questionnaire were interpreted.

The questionnaire had the aim of collecting citizens' perceptions and reactions to a series of tools designed by the SECOA project to manage environmental coastal conflicts. Citizens were invited to express their opinions about the usefulness of those tools for the management and mitigation of the ongoing conflict in the Costa Teatina National Park. The questionnaire proposed ten questions in the form of statements; citizens could participate choosing one of the following answers: full agreement, partial agreement, neutrality, partial disagreement, total disagreement. Citizens were also invited to indicate their gender, age, place of living, job sector and working condition. Those information were helpful in elaborating the questionnaire results.

The proposed questions concerned the following themes: (i) problems, challenges and possible contributions of the stakeholders to conflict management and mitigation; (ii) evaluation of SECOA methods and tools. The tools proposed included maps, videos, databases, websites, open forums, handbooks.

[4] http://www.nuovosensocivico.it/secoa/questionario.asp

Figure 6.9. The first page of the online questionnaire.



Parco della Costa Teatina
Questionario

Home Questionario

QUESTIONARIO

1	Uso di mappe che rappresentino scenari alternativi di sviluppo del territorio del Parco (es. Piani Regolatori Generali, Piani del Parco, Piani di tutela ambientale)	Seleziona un valore
2	Diffusione di video in cui si spieghi quali sono i costi per la comunità locale conseguenti ad una gestione sconsiderata del territorio (es. a seguito di calamità naturali)	Seleziona un valore
3	Diffusione di video in cui si evidenzino le pressioni che le popolazioni e gli insediamenti produttivi esercitano sull'ambiente e le risposte che l'ambiente dà (es. DPSIR)	Seleziona un valore
4	Diffusione di video in cui si evidenzino le conseguenze di diversi meccanismi di gestione della costa (es. uso di limitazioni all'uso della fascia costiera, uso di barriere fisiche per evitare l'erosione, uso di piani marini)	Seleziona un valore
5	Diffusione di video nei quali si spieghino le situazioni di conflitto, la loro origine, le diverse posizioni assunte dagli attori locali	Seleziona un valore
6	Diffusione di dati aggiornati e organizzati per garantire la trasparenza dell'informazione	Seleziona un valore
7	Diffusione di documenti in cui si riportino esperienze di altri conflitti	Seleziona un valore
8	Diffusione di manuali ad uso di non esperti per spiegare i fenomeni naturali e le loro conseguenze	Seleziona un valore
9	Predisposizione di siti web continuamente aggiornati sull'evoluzione del conflitto	Seleziona un valore
10	Predisposizione di un forum aperto di discussione tra i rappresentanti delle istituzioni, delle imprese, della comunità locale	Seleziona un valore
	Sesso	Seleziona un valore
	Età	
	Posizione nella professione Seleziona un valore	
	Altra professione	
	Settore di attività lavorativa Seleziona un valore	
	Altro settore	
	Città di residenza	
	Note	

Invia i dati inseriti Annulla

In Table 6.3 a summary of the strengths and weaknesses of the tools introduced and discussed in this section is presented.

Table 6.3. Strengths and weaknesses of the tools

Tool	Potentials	Risks/Pitfalls
Contacts with the stakeholders	New opportunities for the research team to better focus the problem/conflict.	High risk of getting influenced by the stakeholders opinions and points of view. Risk of losing the neutrality underlying a scientific research.
Articles on local newspapers	Possibility of reaching a wide and non-specialized audience. Good opportunity to stimulate the debate at local level, contributing in the conflict definition.	Risk of being exploited by the local stakeholders for their specific points of view and interests. Risk of being confused with policy-makers. Risk of being considered not neutral to the topic.
Public conferences	Good opportunity of providing details about the problem/conflict analyzed in an interactive way. Good opportunity to establish new contacts with the local stakeholders. Good opportunity to get feedbacks and reactions from the public at large.	Risk of being exploited by the local stakeholders for their specific points of view and interests. Risk of being confused with policy-makers. Risk of being considered not neutral to the topic.
Spatial Shang	Good opportunity to make a specialized audience more aware of the problem/conflict. Good opportunity to involve a specialized audience in the decision making process. Good opportunity to test a methodology that could be used in similar cases.	Risk of choosing non appropriate stakeholders and getting results that do not represent the point of view of the majority of the stakeholders in the area.
Maps with scenarios	Good opportunity to inform a specialized audience of the possible consequences of alternative choices	None
Videos	Good opportunity to reach a wide audience	None
Webpage	Good opportunity to reach and inform a wide audience	None
Questionnaire	Good opportunity to involve a specialized audience in the decision-making process.	Risk of getting non-representative results because of the self-selection of the respondents.

5. Discussion and Conclusions

All the strategies and tools discussed in this chapter could be further developed in collaboration with stakeholders. None of them should be used as it is in other situations, since they were customized to a specific time and purpose. However, some general remarks can be made:

- The strategies and tools that were chosen to work with, are adapted to the Italian and local socio-cultural environment; they will probably be useful in similar situations, in other Mediterranean countries, for instance;
- They had the interaction between researchers and stakeholders as a rule;
- They had the participation of the widest possible public as one of the main aims;
- Some of the tools used are typical of the researches carried out in social sciences, some others were pure dissemination tools;
- They did not intend to solve the conflict; they intended to support the local stakeholders in the conflict mitigation process; in some cases they failed in this purpose.

All the strategies and tools discussed have been thought and designed for understanding and analyzing the ongoing conflicts and for supporting the local stakeholders in the process of conflict resolution. This could be a contribution for improving the still underdeveloped (Integrated) Coastal Zone Management Mechanisms.

Italy is currently facing a severe economic crisis. This is occurring in a socio-cultural context that has never been very conscious and aware of the environmental issues; in a political context that has never been very much oriented to environmental-led policies. In Italy, the institution of protected areas and national parks, traditionally followed a top-down approach. Our research has shown that a bottom-up approach, through the process of experience-sharing and active participation, is needed for (hoping in) the success of such initiatives. The best approach would be a mix of top-down and bottom-up strategies, supported by appropriated tools.

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Notes

Although this chapter is the result of a joint work by the two authors, Simone Di Zio wrote section 3. and Barbara Staniscia wrote the rest.

PART 3. SCHOOL DISSEMINATION AND THE TEACHERS FEEDBACK BY SCHOOL TEACHERS: CIVITAVECCHIA AND OSTIA AS CASE STUDIES

CHAPTER 7.
Project Secoa in the school Plexus Borgata Aurelia, I.C. Don Milani in Civitavecchia, School year 2012/2013

Paola DE FAZI

1. Introduction

Paola De Fazi (the teacher) and the classes IG and IIG joined the SECOA project following the participation in the Big Blue Exposition in 2013. The classes involved belong to the Comprehensive Institute Don Milani in Civitavecchia, part of the Borgata Aurelia school plexus. Borgata Aurelia is located in the north-west side of the town close to the docks, the power plant, the city landfill and the industrial area. The village was built in the years' 30 of the XX century as a garden city for the people employed in the aluminum factory. The residential area created by the architect Anna Piccolomini was designed as a radial expanding nucleus centered on an octagonal square surrounded by public and service buildings. Special attention was focused on the green areas and landscape. It was meant as an example of modernity and pollution free environment. However after the second World War, the aluminum factory was destroyed by bombing causing the area to fall in a slow decline. Today the population is heterogeneously composed by army personnel, ENEL power plant and docks employees, craftsmen, teachers and citizen form eastern Europe.

The school Plexus includes three types of institutions: Kindergarten, Elementary and Middle school; the classes involved in the SECOA project are the first and the second grade of middle school: the first counts of 21 students, including 13 males and 8 females aged between 10 and 12 years, the second is made up of 26 students including 14 males and 12 females aged between 12 and 13 years. In both classes the students are interested in the lessons dialogues and discussions during which their active involvement is sometimes even exuberant. The students comply with the average cultural level of the city inhabitants. Outside the school environment, their primary interest is targeted to sports: football, martial arts, volleyball, skating and swimming.

Usually in middle school, Environmental Education is not among the complementary subjects. Therefore the teacher who joined the SECOA project has addressed the issues during the Geography, Civic Education and Italian lessons with readings and articles taken from newspapers and magazines. The students are aware that air pollution is a serious matter, caused by industrialization, traffic and the usual activities within a city, but they also know that, in their city, the air is polluted due to cruise ship which is increasingly numerous and the ENEL power plant. Given the importance of the subject, the teacher knowing that this it is considered a cross-discipline, has decided to temporarily reduce other literary subjects and devote more time to environmental education, which is of particular relevance.

2. Guidelines for the meeting with the Scientific Coordinator of the SECOA project

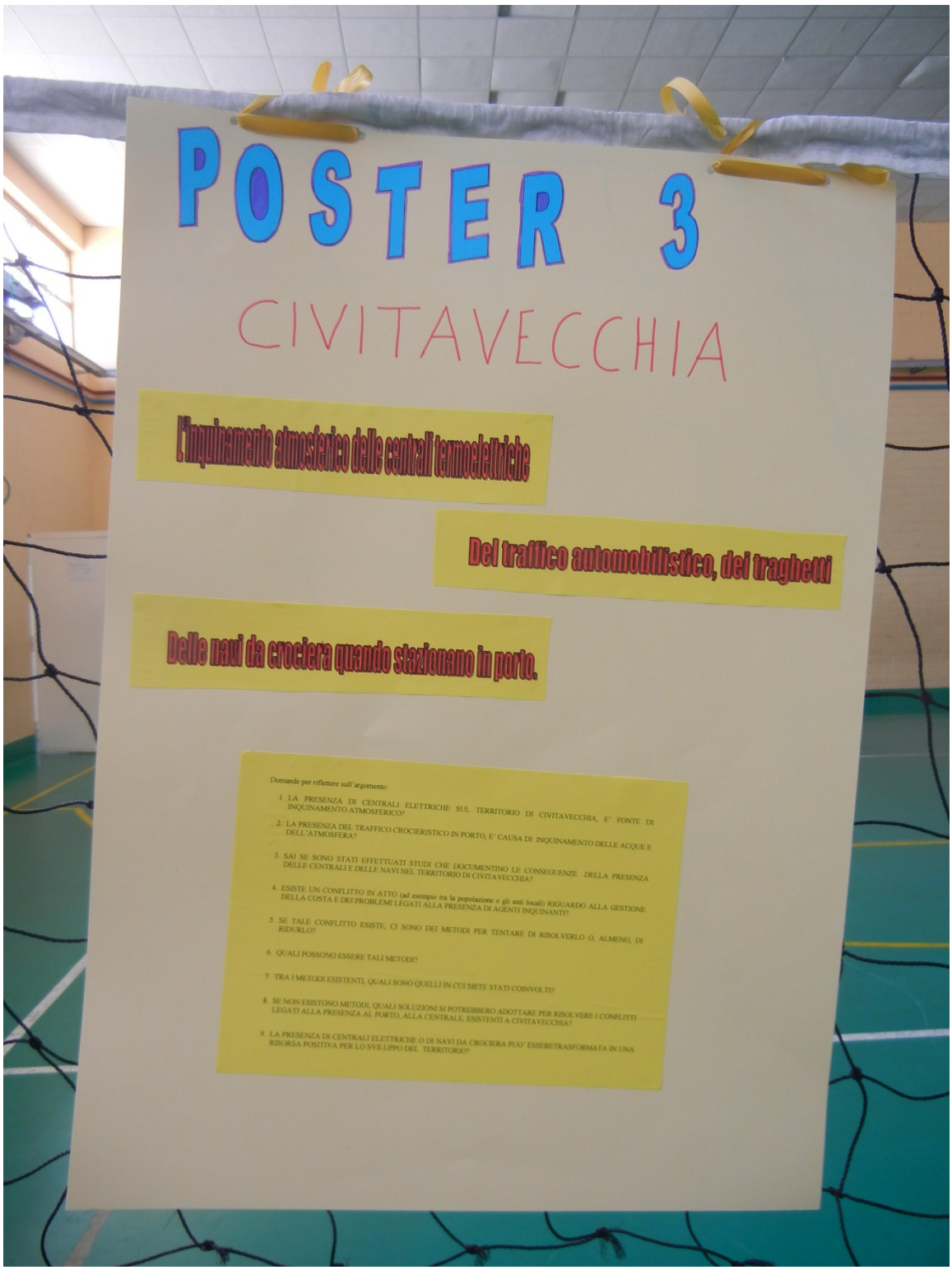
- The teacher and the classes attend the Big Blu Exposition 2013.
- The teacher adheres to the SECOA project and receives videos and images.
- The teacher revises the SECOA material.
- The teacher, with the support of a Lim, shows SECOA videos and images to the class.
- The teacher holds the projection in order to focus on certain section and explains concepts and terminology to the students.
- The teacher and the students elaborate SECOA concepts and work together to realize billboards regarding the analyzed subjects showed in the videos.
- The teacher prompts the students to talk within their families about the arguments covered during class since they live in a reality where the topics directly affect the environment and the health of the people living in this area. The teacher also suggests that students themselves become promoters of the raised issues with the aim of making them more aware of the related dangers and to ensure that the topics do not remain within the school as a simple theory.
- Having become aware of the environmental problem and wanting to educate the students on the topic, the teacher and the students decide to create an "Eco game" (see BOX 1) because they believe that through the game is easier to learn concepts at any age.

3. Description of the tools and the actions for the participation in the SECOA project

- The teacher introduced the topic by reading newspaper articles and anthologies.
- The students went through the SECOA material using the Lim of the school and the teacher's explanations.
- The SECOA material was useful since it helped the students to immediately visualize the topics.
- The students and the teacher designed the billboards on which they wrote the questions to submit to Professor Montanari during the meeting in their school in Civitavecchia (Fig.7.1; 7.2; 7.3;7.4).

Fig.7.1, 7.2, 7.3, 7.4 photographs of the meeting with the scientific coordinator of SECOA.


POSTER 2
LE 8 AREE METROPOLITANE DEL PROGETTO SECOA
SAPIENZA
armando.montanari@uniroma1.it



- The experience ends with the realization of the eco - game and a concluding report.

4. Use of images and language

The language used for the images and videos, in its specificity, was at times complex for this age group of students, but the teacher prior to displaying the SECOA material, prepared the classes on the subject for several days. Therefore they have had less difficulty while watching the videos.

5. Hints

- Increase the number of drawings because they have a higher impact on young students and focus on images regarding Civitavecchia since children gets more involved if they recognize places they live in.
- Spread the addressed issues through the institution so that students can feel the significance and urgency of the problem.

6. Conclusions

The students participated with interest on the suggested activity and the university teacher in charge of the project, during the final session of the meeting, was able to engage them in a debate instead of just a simple lecture. In the days following the meeting the teacher asked the students to create a written report which showed that many of them had spoken and discussed the suggested topics, within their families and friends.Hence the teacher had the idea of creating a game-like exercise centered on the ecological problem of pollution since through game play it is much easier to promote interest on the problem among children of all ages. It was a beautiful and interesting experience that I hope to repeat in the future. The audience was fascinated by the magnitude of the topics and the speaker was able to keep high levels of interest and involvement. It should be a school priority to create links between the subjects studied on books and the actual reality. In addition, the teacher noticed that the presence of a university professor has been for the students that quid pluris has enhanced their focus and attention.

Box 1. the ECO GIOCO «Respect Nature: Happy Nature»

How to learn playfull

1. *Aim of the game* – understanding the important topic pollution through an enjoyable activity like playing the game;
2. *Who is for the game* – the game, that involves more than one person, is for all citizens of all ages;
3. *By which means* – playing cards, die, markers.

The game consists of the following parts

- A **billboard** divided into 21 sections some highlighted with red to indicate danger; some sections have a inscription "Risk" and the other inscription "Bonus". The player who places the marker on one of these sections, must take a eco – card and answer the question that he proposes.
- A **die**.
- **Markers**.
- A bunch of **eco – playing cards**.

Box Figure 7.1. eco-playng cards and the die.

The markers are starfish, seahorse, posidonia and shell of different colours. These objects were chosen to maintain the link with the sea and the coast.

The **eco – playing card** are marked with a different symbol:

- Cards marked with the *starfish* indicate that the player will have to answer to a simple general question;
- Cards marked with the *risk* indicate that the player will have to answer to a question on pollution to continue the game otherwise the player will remain stationary for a number of turns indicated on the playing card, before continuing the game.
- Cards marked with the *bonus*, are a reward and indicate that the player can move forward with some icons indicated on the playing card after answering the question written on bonus card to continue the game. If his answer is wrong, he will remain in his boxes.

How to play

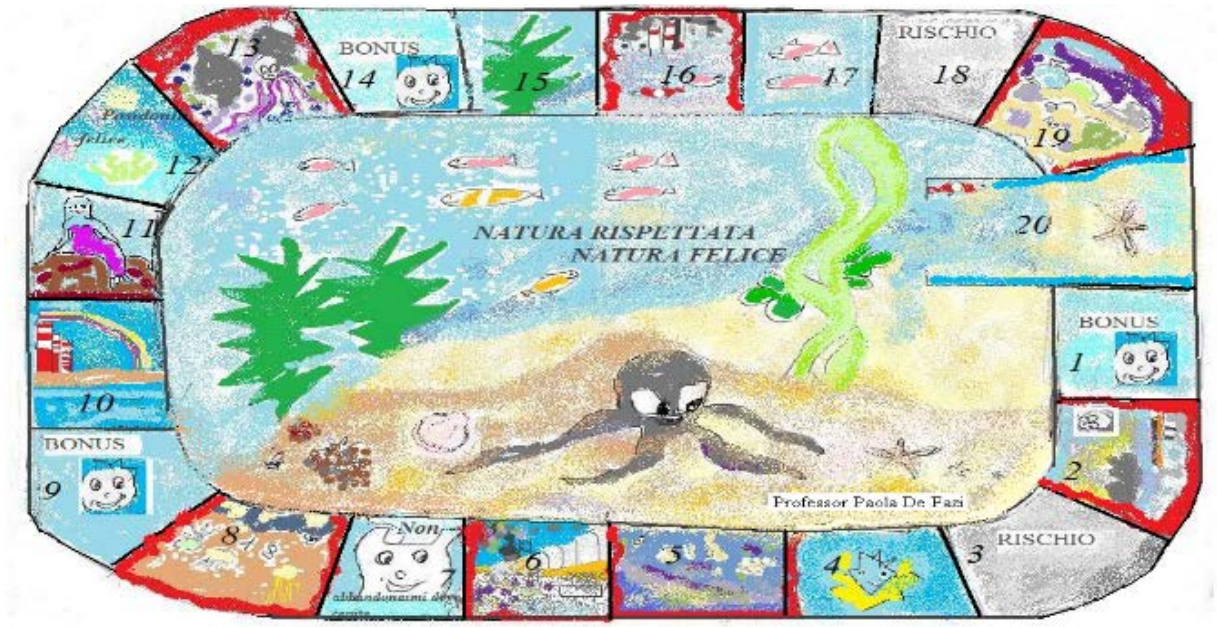
Every player takes a marker and after the count, starts the game. The first player rolls the die, if the number reached corresponds to a "special section", takes a eco – card and after answering the question written on the playing card, puts his marker on the section indicated by the score, then hand passes to another player and so on. The player who places the marker on highlighted with red box, will have to fish an eco – card from the starfish bunch and, if he doesn't answer rightly will remain stationary for a ride or more.

ECO GIOCO

«Respect Nature: Happy Nature»

Professor Paola De Fazi

Box Figure 7.2. The eco gioco bill board.



Explanation of the illustrations in the boxes of the game:

- Box n. 1: card marked with *Bonus*;
- Box n. 2: tanker, as example of pollution of the seas and oceans;
- Box n. 3: card marked with *risk*;
- Box n. 4: starfish, one of the creatures that live in the clean seas;
- Box n. 5: the waste left by tourists and bathers, which contribute to polluting our beaches;
- Box n. 6: sewers which discharge into the sea;
- Box n. 7: the plastic bags are not biodegradable, should not be left in the otherwise likely to be danger to all living beings;
- Box n. 8: objects that pollute our beaches and causing the death of living beings;
- Box n. 9: card marked with *Bonus*;

- Box n. 10: if power stations are equipped with appropriate filters, the fumes are not harmful to the environment;
- Box n. 11: the siren, indicating the joy of clean sea and all marine creture that are respected and live happily ever after;
- Box n.12: Posidonia is the seaweed that lives along the coast and offers refuge to the fish. First it was threatened by pollution but grows where there is respect for nature;
- Box n. 13: exhaust gases that cause pollution of natural habitats
- Box n. 14: card marked with *Bonus*;
- Box n. 15: algae represent a clean;
- Box n. 16: the toxic fumes of the central cause air pollution but also of aquifers and consequently also of the seas;
- Box n. 17: happy fish swimming in a pristine sea;
- Box n. 18: card marked with *risk*;
- Box n. 19: the indifference of the people may result in pollution of the beaches and the consequent destruction of marine environments;
- Box n. 20: The starfish, the symbol of pristine sea and clear;
- Box n. 21: the winner reaches this last box of the game. It represents the sea respected and so happy with all the creatures that inhabit it.

CHAPTER 8.

Education: Science students at the Vincenzo Pallotti secondary school encounter real-world science with the SECOA project

Professor Francesco DURANTE, deputy head teacher,
at Vincenzo Pallotti secondary school

1. Introduction

The duty of schools is to foster skills in today's fast-changing environment. With every aspect of society undergoing change in the modern world, there is a need for the school system as a whole to take effective action and provide clear answers. It is precisely at delicate times such as these, requiring serious thought and complex decisions, that teachers often feel insecure, as they have been trained to provide a different kind of service which is perhaps only partially useful in the current situation.

School is often the place where family, social and behavioural problems come to light. But these are only one aspect of the issues affecting modern society. In most cases, teachers find themselves having to step in for specialists who are trained to tackle such problems, rather than merely providing co-operation and support. But school is not the panacea; it cannot do everything, and neither can it be expected to carry out a function other than its own.

School is, above all, a place for learning. Its job is to develop skills, motivation and enthusiasm of individual students, and encourage them to overcome daily challenges by giving them the tools they need to achieve their goals. To obtain these results, each and every teacher must study, up-skill and allow themselves to be guided by passion in the various sectors of knowledge, particularly in the field they teach, so as to convey new knowledge to complement dry textbook information and overcome the limitations of the current education system.

The ambitious objective of this institution is to create a teaching community that is helpful, professional and culturally open-minded, and has a strong relationship with families and students. Our school wishes to be a benchmark for the territory of Ostia, and to set itself apart through uncompromising academic commitment and by providing training that goes beyond the classroom experience to promote frequent contact with the real world.

"Knowledge is power" is the basic premise of scientific study at the Istituto Vincenzo Pallotti, and the guideline for its teaching methods. The need for this approach comes from our awareness of the complexity of the society in which modern students live. It is precisely within this difficult context that the school is called upon to assert its importance as an educational institution – in terms of its teaching function, to make students acquire a critical awareness of the world surrounding them, as well as its function of transmitting concrete values. Therefore, teaching a class cannot merely be a process of transmitting a specific volume of knowledge, as some teachers think. Rather, it implies recognizing the unique personality of each student, based on an overall view of his/her aptitudes and potential.

To teach is to constantly and coherently train a person to have comprehensive knowledge over time. Therefore, studying science means studying the scientific 'method': stimulating students to collect and analyze data obtained either directly, through personal research, or by cooperating with other students under the guidance and supervision of the teacher. The partial, and final, objective is to gradually acquire suitable language to express what one has learned in a concise, efficient way

using appropriate terminology, starting from the etymology of words. Teachers should also encourage the development of the ability to think critically and make discriminating judgements, which is useful to help students filter the information they gather, often chaotically, from newspapers, books, the TV, the radio and Internet. Other ways to integrate theoretical learning with practical experiments are: (i) a lesson followed by a discussion; (ii) simple laboratory work, (iii) group work; (iv) the use of audiovisual equipment; (v) the use of computers; (vi) excursions; (vii) visits to museums and laboratories; (viii) taking part in science contests and events.

It was from this perspective that we undertook to collaborate with the Secoa project. In previous years, our school participated in the various initiatives proposed by "*Pelagos, un passaporto per il mare"*, a programme that initiates students into maritime heritage issues, and involves specialists who supply insight into the various phenomena taking place in our territory. Students are encouraged to be not merely users of the sea and beaches, but rather active players, through permanent training, in defending the marine environment. The school's entry won the Pelagos graphic arts contest, and was used as the image for the following year's contest. This was the first time our students had come into contact with real-world science and undertaken a project to complement their classroom work. Our latest collaboration, with the Secoa project, came about simply because our science teacher attended a conference at the Rome trade fair grounds. The enthusiasm of our students, their curiosity and desire to learn new information about their territory, and the enthusiasm of the organizers, led over the following weeks to a series of meetings between our students and Professor Montanari. The meetings resulted in a short film screened in the course of an international conference, *"Promuovere il dialogo innovativo tra i ricercatori e le parti interessate per affrontare le sfide ambientali future"* (Promoting innovative dialogue between researchers and interested parties to tackle future environmental challenges together), held on 19 November 2013 at the Exdepò in Ostia Lido. Participation in such initiatives is not the preserve of the science department; it has become an interdisciplinary project involving other fields including the language department, where students interact and present what they have learned in English. This type of programme responds to the need to have students reach the Council of Europe's B2[1] level of language learning by the end of high school.

I have confidence in the work done by all the teachers and students of the school, and await a new collaborative project to help us discover unexplored worlds.

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[1] Can understand the main ideas of complex text on both concrete and abstract topics, including technical discussions in his/her field of specialisation. Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce clear, detailed text on a wide range of subjects and explain a viewpoint on a topical issue giving the advantages and disadvantages of various options.

Box. 1. SECOA PROJECT: OUR LIFEJACKET

The students of the Pallotti Secondary School decided to offer more information on their interaction with the SECOA Project preparing the movie "SECOA Project: our lifejacket". The movie gives the outputs and the lesson learned. The movie presented at the occasion of the Rome SECOA International Conference, 19-21 November 2013, can be found at the following web site: http://www.projectsecoa.eu/images/stories/secoadocs/Meetings/Rome%2019-21%20Nov%202013/Ostia/13_12_20_Secoa_Pallotti-ipad.mp4

We young people today will soon become tomorrow's adults. Future is in our hands. Many are our hopes and ambitions . Our most important certainety will be based on the safety of our land. To guarantee that this will surely happen and develop in time, it is extremely necessary to observe natural phenomenoms and their effects on the ecosystem. In these last years we have noticed a series of phenomenoms which have occured on our planet: all of them have caused disastrous consequences and if they haven't produced substantial damages on humanity yet, they soon will. Therefore we need to avert these disasters because as you all know IT'S BETTER TO PREVENT THAN TO CURE.

Ostia is affected by an extremely serious issue: the erosion of the shore. This geological phenomenom is related to the river Tiber, whose mouth is situated on the boundary between Ostia and Fiumicino. This river was particularly important during the Roman Times and was therefore subdued to a series of artificial interventions which have contributed to accelerate the disastrous consequences which are now occuring in the area.

Analyzing the history it has been confirmed that during the III-II century AD the roman littoral was the most important river port of the time. We know that it has further expanded under the Iulius-Claudia 's dinasty, when it has become a fundamental location of commercial exchange, as it was safe to navigate along this river. The area , however, has never been protected , so during the years we have reached a lack of homogeinity in the river-bed , which have influenced the flow of water. In addition various floods have occured and these have caused huge changes of the land and the river. All these historical events have increased the phenomenon of erosion, analyzed thanks to different methods , such as the methereological and idraulic studies and morpho-bathymetry.

In the area between Fiumicino and Cristoforo Colombo Road bathrimetical comparisons have shown a considerable regression of the shore and a major depth of the sea-bed, up to 10 metres in-depth. Furthermore the different genesis of the Delta in the North and South favour

the progression of such phenomenon. In the North the erosion is due especcially to anthropic interventions, such as dame weirs . In the south erosion is caused by the lowering in the exchange of sediments and therefore the overbuilding of the coast. It is also determined by the change in the hydrodynamic coastal regime , altered by the construction of ports.

The protection of the shores is gradually becoming vital and is profoundly connected with the productive and tourist activities which are typical of the littorals. The result is that coastal areas which were once deserted are now highly urbanized and therefore sensitive towards physiological land regressions . In Latium the main cause to define the intensification of the erosive phenomenons is the decrease in the transport of solid elements along the rivers, especially regarding the river Tiber, which influences specifically the Palo-Fiumicino and the Fiumicino-Capo d'Anzio coasts. In general the drop in the transport of sediments is caused by dames, by the excavation of inerts in the river bed, by the protection protection of the land in the hinterland, with a consecutive inversion in the regression or expansion of many littorals.

In addition, we must also consider the increase in the urbanization of the coast, with a consequential distruction of the duny areas; the construction of walls of containment and the presence of reefs along the shore ; the increase in tourism, with a major request of new bathing establishments. The causes of erosion are therefore related to precise social and economical decisions . The littolar of Latium is 150 km long and extends itself from Marina di Tarquinia to Torre Astura. The central part is dominated by the Tiber's delta, which represents the main exit of the sediments and determines the sedimentary state of the area. The beaches are made of sand and are slightly curved , sometimes straight and sorrounded by dunes.

This area has become a an attraction and tourist centre, therefore subdued to a noticeable increase in the population, which uses it both periodically and permanently , as a resident. More specifically the growth of urbanization in this portion of land is equal to 9.20%. This process is primarily due to a positive migratory level , also influenced by the price of the property. This brings to a series of global problems: a growth in temperature, the melting of the polar ice caps, an increase in the level of the sea and consequently the erosion of the coasts.

In these areas SECOA analyzes the effects these phenomenons provoke on human life. In particular the area which includes infernetto is being examined as in this territory floods are recurring . In the neighbouring lands , the natural drainage is insufficient even though they are situated below the sea level. Mutually related events to this which have recently occured are:

1. October 2011: downpour and overflowing of basements of buildings.
2. 2005: flood of the Tiber which alerted the areas of Ostia and sorroundings.
3. Numerous cloudbursts with consequential overflows.

The lack of a functional sewage pipe for plumbing isn't only exponent of the clear damages but also a relevant sign of pollution. Therefore SECOA gives great importance to this: various water pipes are present in the subsoil which assure the simultaneos collection of the stale waters and the rain waters, both guided in the same junction in the sea. The irrigation canals were addressed to the ancient agriculture activity but are now sublimated for the purpose of collecting water coming from the rain , correlated to an increase in the salt wedge. The maintenance of these canals is extremely poor so they are easily obstructed and submitted to inundation phenomenons even after little precipitations . The economical state doesn't favour these conditions, as the administrative system considers more convenient to act after the damages have already been made. On the other hand , it is neccessary to educate the population starting from fundamental environmental principles.

Examining the general damages caused by the social and economical evolution of men and by the global phenomenons of extinction, SECOA project has a relevant role in dividing the natural disasters and artificial actions. The project proposes to society a series of methods which allow an intervention in the territory and directly on the problem not only for long periods but also for a short time. Everything starts from a challenge which researchers have set to postpone what will bring to the loss of coastal branches. It has been predicted that in 2100 the coast will have retreated of 10 cm. Therefore the best remark is : inform to know. Many of these environmental catastrophes come from the ignorance of the territory in which people live. Secoa's offers come from a detailed study of the coastal line, considered an example of dynamism.

Important brief-term points are:

- Maintenance and renovation of the canals.
- Review of the implantation of the collection of civil wastewaters coming from houses.
- Enhancement of the routes of tertiary removal and waste liquids in order to depurate them and use them in the agriculture without having to resort the aquifer.

Relevant long-term points which require an economical financing are:

- Modification and redesign of the system of gathering waters, in order to divide them for a major balance of the subsoil.
- The actuation of the fidopurification plan with the aim of eliminating any pollution in eccess in the canals and in the sea

In conclusion it is necessary to spread this vital message and to sensitize young people in order to make them aware of the serious problem, which is slowly destroying our ecosystem. On this purpose we have collected various ideas regarding projects which would surely facilitate this intitiative:

- Insert this issue in the scolar program.
- Diffuse the problem through pictures and documents, which would guarantee a major attention and curiosity by the students, who would be striked by multimedia materials.
- It is fundamental to inform in order to know: it's time to act. Future is in the hands of our generation, the same generation which uses the immense power of technology often for frivolous aims. Let's take advantage of these means which we possess for what is really important: save our future.
- PEER TO PEER EDUCATION: educate students thanks to the aid of other students who are prepared on the topic. This educational strategy is extremely functional: the meeting would result more fruitful as students would be far more involved in the conversation and therefore they would work in a completely different way in comparison to the traditional instructive methods.

Rome 19 November 2013

PART 4. THE SECOA END USER

CHAPTER 9.

1. The SECOA end user meeting in Mumbai, December 2012

Francesca Lugeri

1.1. Introduction

This era socio - economically defined postmodern, is also identified as Anthropocene, term coined by Paul Jozef Crutzen, Nobel Prize for chemistry in 1995, to define the first geological era in which human activities have been able to influence the atmosphere and alter its balance.

Coastal areas are particularly representative of the typical conflicts of postmodernity/ Anthropocene. Border areas must be analyzed at different scales and from different points of view. Boundary between domains, between ecosystems. Moving line between the sea, impassable barrier as well as corridor. Line exposed to the risk, resource of extraordinary magnitude. The SECOA project runs this methodological line referring to one of the most sensitive problems of the socio-environmental arrangement in the post-modern world. The contrasts in Coastal Environmental Areas are the result of a complex field of forces, that shows increasing pressures on coastal areas: these areas are extremely sensitive in themselves for the geographic location (interface between terrestrial and aquatic environment) and socio-economic organization. (historic land settlements).

Particularly, the role of end users helps to provide a range of methodological and practical purposes, thus ensuring to the project concrete results, effectiveness in the projections, concrete applicability. This function becomes very important especially in the final phase of the project: the SECOA end users and stakeholders, representing various institutions, universities, organizations concerned to the territory, are testimonials of the different social, economic and geographical situations.

The complexity of the issues studied within the SECOA project, requires the development of appropriate and multi-purpose methodologies, such as to enable effective operational strategies.

The end-users/stakeholders sessions, all along the development of the project, allowed the group to exchange ideas and opinions, as well as to share the available data, reaching new results thanks to an optimal use of the related information.

The meeting opportunities between the various end-users and stakeholders (a role corresponding in many points) helped to a reciprocal understanding: the cooperation made easier the identification of the common objectives as well as the declination of the operational strategies according to the most appropriate tactics, referring to each specific situation.

The last end users panel, held in Mumbai (December 2012), has been particularly intense, favouring a special harmony between the participants: such a context allowed end users and stakeholders to define the common aims as well as the specific roles in applying the SECOA project results (fig. 9.1.1.).

Figure 9.1.1. Mumbai SECOA meeting, end users representatives (left to right: A.Lundell –Sweden, C.Geldof –Belgium, C. Kuottmaki –Finland, F. Lugeri – Italy).

The empathic atmosphere and the intensity of the dialogue, have placed foundations for a more structured action in the final project phase, referring to the responsibilities related to the implementation of the SECOA results.

Fig.9.1.2. Mumbai, SECOA meeting with end users participation.

In particular, the end users' working group has exchanged views about the themes of identity, origins, membership organization, with reference to the geo-social contexts, as well as to the professional ones, analyzing their own operative potential (fig.9.1.2.).

The experience of those realities representing the case studies of the project, makes the end users preferential partners in all phases of the activities, so as to render them cultural mediators

Themes and directions emerging from end users' discussion, are summarized in a document, synthesized in the following table:

Table 9.1. End users' Manifesto.

We are :
• From different background disciplines, structures, status..
• capable for a reality-check
• contact with local communities
• related to the case-studies

B - We can provide :
• different point of view (NGOs, planning, social science, ….)
• data, questions, ideas
• ideas/information for scenario building
• openness

C - What do end-users expect ?
from communication:
• socially and politically sensitive method
• Effective dissemination
• Tools to be published in the www.
• end-user networking
• manual on how to understand and use the outputs of the SECOA-project
• Explanation of the methods used (e.g. fact sheets on MCDA,..)

D - From scenarios:
• Visualisable results
• maps for a range of scenarios
• guidelines on how to use scenarios
• flexible and adaptable models
• more than 1 model (e.g. sub-models based on: end-users status, governance status,…)
• tool for increasing knowledge on environmental issues

E - Recommendations
• end-user involvement in the finalisation of the end product (e.g. questionnaire to end-users,..)
• keeping more contact with end-users in the final phase of the project
• the end product has to be 'friendly', but must be scientifically robust
• scenarios must cover: worst case, business as usual, and intermediate; different scales : time and space; timescales beyond election periods

These represent the starting guidelines, here integrated by further observations, developed by each end-user following an in-depth analysis, as agreed during the Mumbai meeting

One of the most delicate theme, that emerged during the last steps of the project, is the dissemination of the SECOA contents and results, in order to reach an effective policy for the management and development of the territory, especially in sensitive coastal areas.

Referring to the latest dramatic events in the world, emerges the need to create a new kind of communication that can reach a wider audience, providing society with correct and clear information on the geo-environmental scenarios of our country. Today, more than ever, is urgent an efficient and timely activation in geo-environmental protection as well as in the field of scientific communication. Knowledge is the key tool: the diffusion of scientific heritage, using topics well known and appreciated, may represent one of the new goals for the Spatial Sciences.

There is a dichotomy between the power of economy and the requirements of the ecology: in this contrast, the research world raises the alarm, analyzing scenarios and creating models in order to find a solution, but without encouraging answers from the policy makers. There is an obvious need for a new approach to the problems related to the complex context that now shows us a planet going beyond the critical point. A holistic approach is imperative to study the planet, a method that considers environmental and social ecosystem on the whole, providing all policy makers with a realistic view of the situation and the possible developments.

At the same time it is necessary to organize communication in a strategic way, thinking about objectives, audiences and messages, in order to communicate the contents to the largest audience, involving society in forms of integrated management for the territorial protection and enhancement.

Here are the roots of the SECOA project: the dissemination of the related contents aims to obtain a concrete and virtuous applying of the studies' results.

The foundation of every balanced land management is based on a participatory democracy, and knowledge is the first tool to reach a concrete involvement of the people. Territorial and environmental themes require the constant participation of individual/community/ society in all the social, cultural, economic and territorial contexts.

A first step in this new direction is to create a new kind of communication that can activate a conscious target audience.

Knowledge and awareness: powerful tools in order to reach and share a "sense of natural identity". The consciousness of being part of an ecosystem, is achieved through knowledge and experience of the environment.

Box 1. Reflections and suggestions elaborated by David Rumble[1], member of the SECOA end-users group

What can end-users contribute?

We are

As a community of end-users, we have provided an opportunity to guide and refine progress of the whole SECOA programme as a 'critical friend'. We have been impartial but able to test the relevance of the research outputs against our 'real world' scenarios. We also present opportunities to secure a legacy of the work going forward as we will communicate and advocate its findings to a wide audience of stakeholders and decision-makers who can use it as an evidence-base to inform policies and ensure sustainable management of the coastal zone.

We can provide

The end-users can provide insights spanning both the research case studies and the communities' local needs. We have been able to provide information and raise questions, and promote discussion from a cross-sectoral viewpoint. We hope that by engaging end-users during the project and not just at the end, we have managed to add significant value to the research programmes.

What do end-users expect?

From communication

The end-users interface with multiple agencies 'on the ground' many of whom do not understand the technical and academic language of SECOA's outputs. To help end-users act as effective advocates and ambassadors for the research we need user-friendly tools and resources so that we can make meaningful and robust contributions to decision-making processes. The extra dimension provided by the international and multi-disciplinary perspective of SECOA is reflected in its end-users. In order to be effective in the longer-term, however, the end-users will need opportunities to have dialogue with each other and with the researchers.

[1] Dr David Rumble, Strategic Head of Conservation & Education, Hampshire & Isle of Wight Wildlife Trust – an independent local UK environmental NGO.

From scenarios

The research outputs for the scenarios have a lot of potential value when re-applied to their context. In order for maximum impact the end-users would particularly value tailor-made high-quality visual materials appropriate to their range of disciplines and situations – including dissemination to the public.

Recommendations

Given that the end-users are fully engaged in their day-to-day work beyond SECOA it may be difficult for them to dedicate significant amounts of time to SECOA outside of meetings. For that reason we recommend a mechanism for dialogue between meetings and after the life of the project. We do recognise, however, that our main contribution is to the final stages of the project and beyond – hence the name 'end-user'. It is here that we are probably best able to make a meaningful contribution.

Further to the information above on 'Scenarios' it is important that the outputs provided cover suitable spatial and temporal timescales and are backed-up with information to demonstrate credibility and robustness of the work to its critics: end-users should be equipped to defend the research.

Referring to the issues listed in the "Manifesto", it is easy to understand how is important the dissemination of scientific heritage implemented within the SECOA project, in the common aim to achieve a shared awareness.

The following reflections, by Asaf Ariel, underline the strategic role of the communication.

Box 2. Reflections and suggestions elaborated by Asaf Ariel[2], member of the SECOA end-users group

We can provide

- Adapt products to be useful for stakeholders.
- Promote the dissemination if encouraged and be provided with the tools to do so.

What do end-users expect?

From communication

- Effective dissemination:
- Dissemination must be done in non-academic terminology as the advantages and usefulness of SECOA products must be underlined to all audiences, of which the majority will not be academics from the SECOA disciplines.
- Workshops and training course/seminars for end users and stakeholders.

The popularization of the social/environmental topics, needful to understand the SECOAproject and its results, requires new ways in communication. A useful starting point in this perspective could be the integration of nature and culture; the awareness of the link between them opens a way to involve the people in new policies for a balanced territorial management.

Moreover, the divulgation of scientific themes, using topics well known and appreciated by the public, may represent one of the new goals in the field of communication, in order to promote sustainable development, ecotourism, enhancement of natural and cultural heritage.

[2] Dr Asaf Ariel, EcoOcean, Israel.

2. The ISPRA Institute

Francesca Lugeri

2.1. ISPRA

The Istituto Superiore per la Protezione e la Ricerca Ambientale (Institute for Environmental Protection and Research) acts under the surveillance and policy guidance of the Italian Ministry for the Environment and the Protection of Land and Sea.

The Institute's activities refer to the following topics: Agenda 21, Air quality, Contaminated sites, Directive 2001/42/CE: Strategic Environmental Assessment, Directive 85/337/CEE: Environmental Impact Assessment, Environmental emergencies, Global atmosphere protection, Green Economy, Impacts and Environmental Management of Ports, Integrated Pollution Prevention and Control – IPPC, Land and Territory, Nature and Biodiversity, Noise, vibrations and electromagnetic waves, Protected Areas, Radioactivity and radiations. Risk of Chemicals: Directive on the control of major accident hazards involving dangerous substances, Sustainable development, Technological Risk, Toxic algae. Waters.

2.2. ISPRA activities

The Institute provides Environmental Services:
Air quality data, "Carta della Natura" system, Emissions Trading Register, Environmental Situation Centre, Geological Survey of Italy. Historical data of the Marigraphic Service, IPPC - Integrated Pollution Prevention and Control, Large combustion plants, Monitoring of the MoSE System, Portal of Geological Survey of Italy, Real time data from the National Wavemeter Network, State of the coasts.

2.3. Which are the suggestions that stakeholder poses for the calls for HORIZON 2020?

Horizon 2020, specific requests:

- *In the formulation and management of the budget*
- *In the preparation of the research program*

A territory's identity is formed by a combination of morphological, naturalistic and anthrophic elements: natural beauty, climate, wine and food, archaeology, and culture. The connection between people and their territory, which is expressed through landscape, is a surprising resource for a society, and which, if managed in the right way, can promote sustainable

development. Interaction with one's environment is a continual and delicate process in which balance and harmony, rather than specific targets, should be the guiding principles.

The popularization of the geo-environmental heritage walks on the same paths of tourism: the integration between nature and culture will be a useful tool in this perspective.

Landscape plays a key role in the knowledge processes: it is the result of the endogenous and exogenous activities that mould Earth's surface and, at the same time, can be considered the result of the interaction of many natural and cultural components; being the object of human perceptions it could become a tool to communicate the Earth Sciences to the whole society.

The key role of the landscape is in its perceptive and symbolic power: it is what mankind interacts with, from the first contact with the environment, source of resources, risk, emotions.

Landscape is everywhere, but needs to be understood and recognized as a heritage; at the same time it needs to be protected, in order to become a resource: the quality of landscape impinges on person and social well-being; moreover, as finally ratified in the European Landscape Convention (2000) "Landscape is everywhere and is an essential element of quality of life and cooperates in the development of local cultures".

- *In the management of the program.*

Continuity is desirable and useful in team training and management.
Integration processes of the experience require time and perseverance; in parallel, the objective of a project as complex as SECOA is, needs further development in order to apply the results of the studies, implementing policies for real changes, referring to individual, community, society.

- *The publication of the results*

GIS as a component in the "tool kit" for dissemination:

Cartography, particularly the digital cartography and GIS, are high-potential instruments to represent the significant link between nature and culture: maps are the most complete tools that allow a thorough understanding and a clear image of the studied areas.

Thematic maps provide us with the identification and representation of the natural environment and constitutes a necessary basis for the evaluation of its state; at the same time they represent a powerful tool to communicate the territory to the society.

Geographical Information Systems are able to hold a wide range of information on the physical, biotic and anthropic environmental components, and allow the operators to evaluate their inter-relations, especially in order to locate the natural resources and areas to be submitted

to protection. Moreover, GIS are flexible, multi-scale, dynamic, updatable tools; different scales of analysis allow us to consider the object of study from different points of view.

2.4. In the SECOA project reference was made to a static and traditional dissemination, in which the information is transmitted by researchers to stakeholders, and a dynamic dissemination, in which the dissemination is realized in a reciprocal manner (researchers - stakeholders - researchers). Could the stakeholder give some comments?

The communication of the Territorial topics, through a simple and rigorous language, is a priority, shared by all the institutions responsible for the actions, for land use and management and for risk prevention. .

New ideas can activate unusual and interesting pathways of knowledge. A special attention is going to be devoted to an original link between landscapes and sports, such as road cycling events e.g. the "Giro d'Italia" (fig.9.2.1).

Figure 9.2.1. Giro d'Italia 2013 – Anteprima Giro RaiSport2 – Scientific divulgation during the stage, nearby the Italian cycling champion FrancescoMoser.

The cycling, popular sport par excellence, which has retained its identity over time, represents a spatial-temporal relationship between individuals, communities and societies. The Giro d'Italia is the most appreciated race in Italy and can be identified as a tool of great communicative and multifunctional potential.

The "GeoloGiro" is a proposal for the popularization of the scientific knowledge, explaining the geological setting of the landscapes crossed by the cycling race "Giro d'Italia".

The project is started, thanks to the synergy established between the Geological Survey of Italy-ISPRA, the National Council of Geologists and the "Gazzetta dello Sport", the legendary Italian pink newspaper organizing the race from almost one century.

A better enhancement of the geological heritage of a land can be reached and shared, thanks to a simple scientific analysis of the stages of the Giro d'Italia, according to the "Landscape" methodological approach.

The morphology of the territory becomes a key component in the race context: if explained by the geologist, can offer to the public a new and interesting point of view of the landscapes, linking scientific information to the agonistic valence of the stage. Shape and position of Italy entails a wide variety of landscape types, natural and anthropic, concentrated in a long and narrow area.

The "Giro d'Italia" is one of the most loved sport event, and is here identified as a tool for the scientific popularization. In the project, the geomorphologic setting of an area is also related to the local culture and tradition, always deeply linked to geology. In this sense, it can help the touristic promotion of a land: the landscape becomes an anti-crisis resource. The presence of World Heritage Site and/or protected areas, gives a further opportunity to deepen the relationship between the nature of the land and its own developed culture.

The Giro d'Italia 2012, have already welcomed the presence of the geologist: the stages in the Dolomites, offered a special chance to observe the spectacular geology of the "pink mountains", UNESCO WHS.

From the Porphyry in the Pusteria Valley to Cortina, the pearl of the Dolomites, in an unforgettable "Dolomites big stage" between geological domains, telling a fascinating geological story starting from the pink colour: the same for the rocks and the leader of the "Giro".

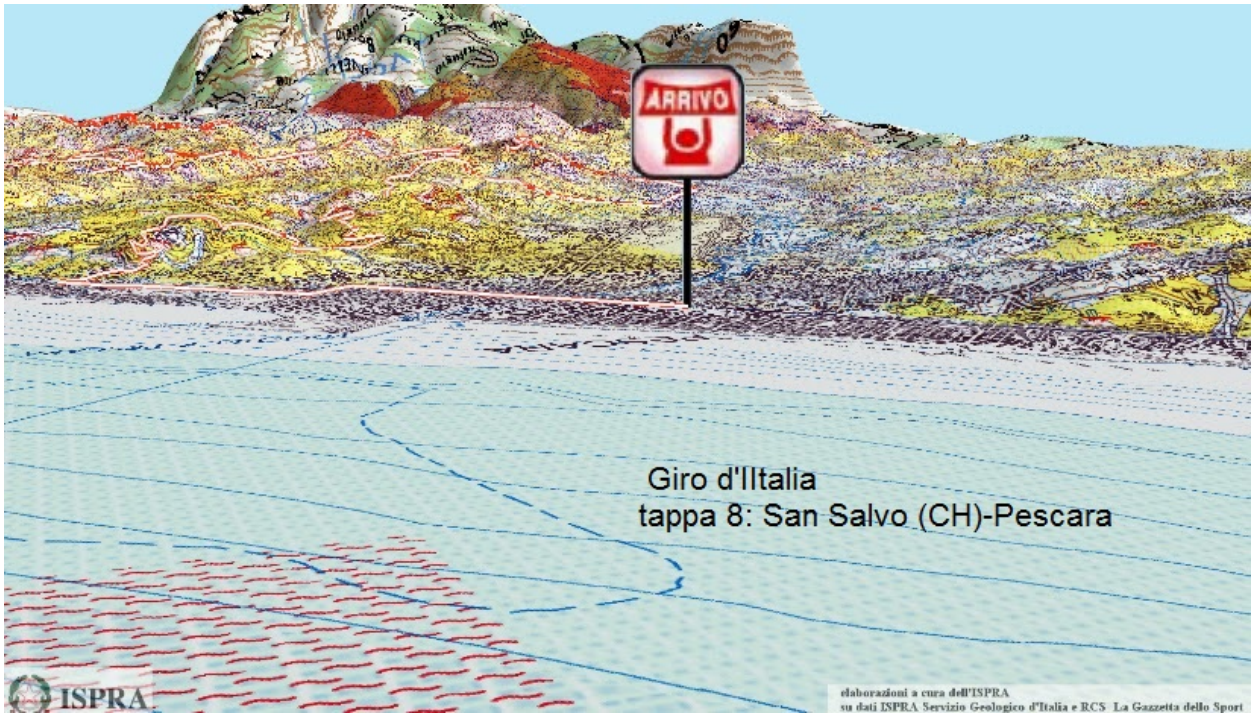
The last edition, the 96th gave us the chance to be present in the live TV transmission during the race, talking about landscape and geology.

One of the stages ran along the Adriatic coast, from San Salvo (Chieti), to Pescara : part of this area is included in the SECOA Italian case studies. The sport event gave the researchers a

very interesting occasion for presenting to the public themes and proposals implemented within the project.

The Abruzzo region is deeply linked to the cycling: the special geo-morphological arrangement of the region offers a complete transition from the seaside to the Maiella and Gran Sasso mountains, trough a hilly zone. Such a landscape is strictly linked to the local culture: it has been recently opened the "Adriatic coast bike route" between San Salvo (Chieti) and Martinsicuro (Teramo) for a total length of 131 km, trough a very suggestive landscape (fig. 9.2.2). Most of this path is included into the SECOA case study: all of us hope that this project has been useful in supporting such kinds of policies, aimed to protect the territory offering to the whole society new chances to enjoy the landscape.

Figure 9.2.2. Giro d'Italia 2013 - stage 8 – from San Salvo to Pescara (Adriatic Coast).



3. Role of NGOs in Research and Management of Environmental Problems: A Case Study of Mumbai

Prof. Sharad Chaphekar[1]

Mumbai faces several environmental problems. Our Institute attends to the problems of air pollution and health, heavy metal and pesticide contamination of sea-foods and vegetables from markets, water management education, etc. NGOs in Mumbai, in general, function more as pressure groups and activate government departments to take suitable action for mitigation of environmental hazards. Some NGOs approach Courts to legally compel Government to act. Since the problems appear in areas within the jurisdiction of the Departments of the State, NGOs can play a limited role in taking necessary corrective measures by themselves. . They are however, occasionally invited for consultation and advice, as Members of Expert Advisory Committees, recommendations of which are binding on executors of developmental projects that affect environment. Mumbai Metropolitan Region Development Authority (MMRDA), through their MMR Environment Society, sponsor research projects aimed at improvement of environment in specific areas within the metropolitan region. Such projects are submitted for approval to the MMR Society by educational and other institutions. Basic research on some eco-physiological aspects in *Avicennia marina,* vegetative propagation in *A. marina, A. alba* and carbon sequestration in *Sonneratia apetala* mangroves is being carried out in a college affiliated to Mumbai University, in collaboration of an NGO. Initiatives by NGOs and academic institutions have often contributed to understanding and betterment of environment in the city. To cite some examples,

1. Protection of mangroves in Mahim Bay took place as a result of suggestion to maintain the vegetation as Mahim Bird Sanctuary, given by Dr. Salim Ali, a world renowned ornithologist who was then President of Bombay Natural History Society, a premier environmental NGO in the country.
2. Development of Godrej Mangrove Park on privately owned coastal land for guidance by the author of this Report, was possible due to an initiative of the industrialist, Mr. S.P.Godrej, who was also the President, WWF (India).
3. Expert advice given by this author to implementers of High Court orders, for measures to consolidate Mithi River banks during river restoration work, without harming existing mangrove vegetation.

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3.1. The Issue of Sanjay Gandhi National Park

A pristine 103 sq. km hilly forest area on the northern fringe of Greater Mumbai city was declared as National Park in 1982. The mixed moist deciduous forest was inhabited by tribals and a few farmers. Several stone quarries in the Park were closed by Forest Department but encroachment by migrants was common. Resettlement of encroachers outside the Park was a major problem in maintaining the Park and its rich biodiversity. The effort of shifting them had to be undertaken by Government due to Court Orders in response to litigation by an NGO. It is however, still incomplete. Construction of compound wall along the boundary of the Park was similarly a result of litigation of NGOs. The wall has been unfortunately, breached in several places, thanks to encroachers.

Diverse flora and fauna like butterflies, reptiles and leopards, two lakes – Tulsi and Vihar – that supply drinking water to Mumbai city, elaborately carved Biddhist caves in basalt rock dating more than two thousand years, and an ancient Shiva temple, all attract thousands of visitors. To the Park. Wildlife enthusiasts, joggers, trekkers, pilgrims to the Shiva temple on auspicious days, need to be managed to avoid accidental fires and / or poaching. Wildlife like snakes and leopards from the Park, occasionally intrude into residential projects adjacent to the Park. Though the Park is managed by the Forest Department of the State, NGOs are also encouraged by Forest authorities to conduct educational trails in the Park, as also for pushing wildlife back into the Park when caught outside the Park boundary.

3.2. Mithi River

Most Mumbaikars learnt about the existence of this small river (length 17.84 km) originating in Vihar lake in Sanjay Gandhi National Park, when it flooded half of the city on 26th July 2005, thanks to 1011 mm rainfall in eighteen hours. The river has been repeatedly trained, including four times at right angles, for facilitating infrastructure like expansion of runway of the international airport. Due to floods the airport, airline employees' colonies, residential areas, roads and highways were under a meter of water for almost two days. Hutments along the river were washed away causing heavy loss of life. Loss of property was immeasurable.

Large number of illegal hutments, leather tanning and other small scale industries started by settlers have caused shrinking of the width, heavy sedimentation and severe pollution of the Mithi river. Bending of the stream, reclamation for establishment of a huge office and commercial complex, decimation of mangroves and filling of the delta region for settlement of fishermen

colonies and other purposes, have affected flow of the rivfer. NGOs along the river. However, the July 2005 disaster had to happen for authorities to take a stock of the river system with the seriousness it deserved. MMRDA have launched a program for de-silting, widening and deepening of the river, to bne followed by its beautification, with the help of private entrepreneurs. NGOs are mostly indirectly involved as providers of expert advice. This author assisted Bombay High Court to ensure that restoration activity along the banks did not affect the remaining mangroves.

3.3. Coastal Areas

Mumbai city is formed by fusion of seven islands over two centuries. Fishermen's villages are scattered all along the coastal areas even at present. Intense construction activity for roads, railway and metro railway and residential buildings, dumping of solid waste like construction debris as also municipal solid waste, are the main reasons for degradation of coastal areas. Oldest residents of the city – the fishermen and toddy tappers (the latter are now extinct) worry about loss of their traditional professions like fishing, fish drying, net weaving, boat construction and repair, while another original group of tribals, the 'Agris' are losing their profession of salt cultivation to developmental activities.

Recently, collision of two ships in Mumbai harbor led to oil spill. Studies carried out by Pollution Control Board and an NGO concluded that though mangroves were coated with a film of oil. They, however survived as observed after a month or so, indicating resilience of the vegetation. No permanent damage was reported.

Whereas two attempts were made during the last two years, to develop Mangrove Parks by Government agencies, didn't take off, a leading industrialist of the country, Godrej, did so on their privately owned coastal land in mid-eighties, i.e. before Coastal Regulation Zones came into existence. This author was involved in that development as an NGO and as an Expert academician.

3.4. Research

Apart from reports in media which are too many to be cited here, some serious research has been and being carried out on Biota of National Park by an NGO, Bombay Natural History Society (BNHS) and by faculty from Mumbai University and affiliated colleges. Some of the work has been published in BNHS journal and other technical journals. Several papers have been presented in Seminars and Symposia. Work done for Godrej Mangrove Park has earned a student his doctoral degree under the supervision of this author. The strength of that work is the development of nursery techniques for propagation of mangrove species of coastal areas of Western India.

The coastal areas were Revenue land till recent past. At present, mangrove vegetation has been declared as Protected Forests and transferred to Forest Department for protection and care. The Department of Environment of the State invited educational institutions and NGOs to undertake research and action programs for restoration of mangrove wetlands. Unfortunately, not many projects have been undertaken in MM Region during the last two years. Even a project to develop a 35 hectare degraded mangrove area into an Educational Mangrove Park in North Mumbai, conceived by MMRDA (a State autonomous development authority under the Chief Minister) and approved by Maharashtra Coastal Zone Management Authority (MCZMA) has failed to take off. Probably, intense infrastructure development activity, planned and in operation, getting priority over mangrove conservation, is the cause for this situation.

4. Hampshire & Isle of Wight Wildlife Trust, UK

David Rumble

Responses in **black** from Dr David Rumble, Strategic Head of Conservation & Education, Hampshire & Isle of Wight Wildlife Trust – an independent local UK environmental NGO and SECOA end-user.

Questions for the SECOA end users

1. explain the type of stakeholders the contributor is representative

Hampshire & Isle of Wight Wildlife Trust is an independent environmental NGO covering two historic and administrative counties. The organisation represents 28,000 members and is affiliated nationally with a network of other Wildlife Trusts. We also work in close partnership with other NGOs and stakeholders to promote and actively deliver terrestrial and marine nature conservation priorities at a large-scale for the benefit of global biodiversity and local communities. We increasingly need to articulate our environmental and educational work in socio-economic terms and manage several thousand hectares of land, much of which is publicly accessible, and supports biodiversity and ecosystem services. In summary we are both practitioners and advocates for members' opinion.

2. illustrate the research and / or management that stakeholder plays

We actively promote 'citizen science' and commission original research to provide evidence to underpin our advocacy and conservation delivery in order to achieve ongoing protection and sustainable management of our land and beyond. We also work with research projects such as SECOA and because of the coastal context of our area we regularly collaborate with researchers active in the coastal zone. The majority of our work is dedicated to active management of local terrestrial and coastal protected areas and networks, advocacy of local marine biodiversity, and education and awareness.

3. which are the suggestions that stakeholder poses for the calls for HORIZON 2020?

- The role of citizen science in monitoring the effectiveness of coastal zone management
- Socio-economic benefits of coastal protected area networks through provision of ecosystem services
- The role of artificial features in mitigating for social/economic/environmental losses arising from dynamic coastal change
- Perceptions of the coastal zone arising from demographic change in the EU

4. Horizon 2020, specific requests:
    - In the formulation and management of the budget
    - In the preparation of the research program
    - In the management of the program
    - The publication of the results

The organisation may be able to assist in a similar way as to SECOA: as an end-user and link to local scenarios, as well as during the preparation of the research programme and dissemination of results.

5. in the project SECOA reference was made to a dissemination static and traditional, in which the information is transmitted by researchers to stakeholders, and a dynamic dissemination, in which the dissemination is realized in a reciprocal manner (researchers - stakeholders - researchers). Could the stakeholder give some comments?

Dynamic dissemination is the preferred model from a stakeholder perspective. The outputs of many research programmes in our experience have remained in the academic community and not effectively been disseminated to stakeholders through the traditional static route. Building reciprocity into dissemination as a project deliverable will enable stakeholders to engage with and direct the research in a way which matches the needs of stakeholders and practitioners more effectively.

4.1. Conservation & Education Programmes at Hampshire & Isle of Wight Wildlife Trust – a SECOA Project End-User

The challenges facing the Conservation and Education functions of Hampshire & Isle of Wight Wildlife Trust are multiple and complex. We continue to face local and national losses of biodiversity and major contributory factors in the relatively prosperous Hampshire area include pressure on green-space for development and recreation, agricultural policy and markets, and the legacy of past fragmentation and degradation of the ecological network. In addition we are witnessing a profound loss of engagement of individuals and communities with their local natural environment, and the multiple social and economic benefits of 'natural capital' are not being realised at a number of levels.

The Trust's 'Living Landscapes' strategic approach draws on robust scientific evidence to protect, restore and reconnect fragmented and degraded natural habitats at a landscape scale in targeted areas. Central to this strategy is the practical delivery of conservation management across a network of nature reserves and other landholdings totalling several thousand hectares of terrestrial, riverine and coastal habitat. In addition we actively engage with relevant policy areas to protect biodiversity, and provide advice on conservation to landowners to extend the impact of our work beyond our estate. Our marine programme is entitled 'Living Seas' and through it we seek to increase people's understanding, through the gathering of marine biodiversity data, and advocate marine protected areas locally by disseminating this data. All of our programmes rely on strong engagement with people and our education work seeks to ensure current and future generations have an opportunity to understand and value their local natural environment. This work combines 'experiential' learning outdoors - relevant to the national curriculum for children; outreach to the public, research links with universities, and promotion of citizen science and training courses to improve ecology skills in adults.'

5. Risks, Planning and Governance Challenges in Coastal Areas: Municipality of Albufeira and the SECOA Project

Aquiles Marreiros[1]

In the national Portuguese panorama Albufeira is mainly a tourism city based on the sun and sea product, recognized as the major holiday destination in the country, as well as for some European tourist markets, including the UK, Germany, Holland and Spain. With a 30 km-long coastline, the beaches are the most expressive tourism product of Albufeira, whose quality is recognized and certified annually with the national leadership in the attribution of blue flags. It concentrates also the major tourism indicators of the Algarve region (42% of accommodation, 45% of overnight stays, 40% of tourists and almost 80% of the resident population working in the tourism sector). However, the growing tourist demand of Albufeira, since the 1950's, led to a high and disorderly urban growth, almost without a plan, which led to the decharacterization of the city, to a "patchwork" urbanism and caused tremendous real estate pressure on coastal areas with high environmental impacts.

Within the SECOA project, the municipality of Albufeira takes the role of the end user, representative of the local public authority. At this level of governance in relation to the coastal areas, the municipalities gather several responsibilities: management, planning, licensing, tourism, environment and cleaning, civil protection, safety, all in a complex framework of desirable sustainability (economic, social and environmental). However, in many of these matters, responsibilities are shared with national and regional government authorities, which do not always favor a correct and rapid response to questions on coastal areas, as well as to the uses and economic activities allowed in them. For example, on a beach, there are different powers and levels of decision: setting of the bathing season period; installing and granting of beach facilities; urban licensing; cleaning; surveillance and rescue of castaways; street trading; licensing of recreational activities; information, prevention and safety; fishing activity; licensing of boats, among others. Combined efforts in governance oriented for results and for shared responsibility by the decision-makers at different scales, highlight the need for a better coordination and operation of services, more effective and closer to the beneficiaries, individual or collective, private or public.

[1] Municipality of Albufeira <aquiles.marreiros@cm-albufeira.pt>.

The unique characteristics of Albufeira, which has in tourism its main economic activity, concentrate problems common to this type of city. Seasonality gathers several items - economic, social, employment, security and crime, management, planning and scheduling of equipment's and infrastructures, management of human resources allocated to tourism support services, collection and treatment of waste, supply and water treatment, among others - whose level of response requires effectiveness, efficiency and sustainability to meet the recorded population variations, that go from the 40.000 surveyed individuals to 300.000 present during the summer months.

The problems identified are also challenges that the municipality has to deal. When planning and managing a city like Albufeira, when programming equipment's and infrastructures, we should do it for whom? For the 40.000 or for the 300.000 individuals? This is the core challenge in municipal management of a tourism city, which should be guided by the versatility of the equipment and the adaptability of its human resources.

If in the tourist point of view the image and attractiveness of the destination are crucial, security and risk management are of utmost importance. In this sense, Albufeira has developed in the last decade, along with the national authorities, an integrated operation of urban requalification called POLIS Program, which had as main objective the intervention on the seafront of the city boosting the creation of new areas of public space, creating conditions for the development of economic activities, as well as a concerted action on the safety and enjoyment of the beach areas, for example, with the execution of operations of control of coastal erosion and consolidation of the cliffs (MAOT; CMA, 2000).

In the context of the participation of the Municipality of Albufeira as end-user of project SECOA, there are numerous expectations regarding the outcomes of the research in such sensitive areas as risk management and conflict mitigation. In most types of risk studied under the Project, Albufeira has significant historical records, almost always accompanied by tragic episodes of destruction in the urban environment and loss of human lives. The great earthquake of 1755, followed by a tsunami, destroyed much of the town and killed the majority of the population, leaving only 27 houses (Pereira de Sousa, 1919). Episodes of flooding are common in Albufeira, the most destructive records occurred in the 40's and 50's of past century (Amado; Nobre, 1997), but also numerous episodes in the last decade, already after the intervention of the POLIS Program in the city center, with consequences, especially in terms of commercial establishments and restaurants. Concerning coastal erosion, there is also recorded episodes of falling of cliffs, which led unfortunately to the death of 5 people on a summer day in one the

beaches of Albufeira, in 2009. This occurrence led to a widespread intervention all along the Algarve coast.

Planning tools and risk prevention, supported by scientific and technical information relevant to the daily operation of municipal services and the simulation in critical situations turns out to be of the greatest utility and relevance within the competence of the municipality of Albufeira, especially spatial planning, the civil protection and environmental management. When the image of Albufeira supports the local economy, the urban qualified areas, the pleasant public spaces, the clean and safe beaches are motivations to be considered in the tourism demand and in the global qualification of the destination. But also contribute to promoting business and attracting investment and hence employment, reducing the main problem mentioned - seasonality.

In Horizon 2020 based on the principles of intelligence, sustainability and inclusion for growth, in a clear development strategy and territorial cohesion, should be created mechanisms that allow the dissemination and efficient use of research that develops within the European Union, making it a benefit for the territories, within a logic of continuous learning, testing and sharing practices and innovative methodological approaches. At the local level, European incentive systems should embrace these principles and facilitate their rooting in the areas of competence of municipalities, for example, consolidating the contributions of the project SECOA on an innovative, forward-looking and dynamic land management.

At the level of dissemination of results during the research process, the interest and relevance of the issues addressed in the project SECOA were well patented in the responsiveness and institutional representation obtained in meeting with local stakeholders conducted by the Portuguese team in Albufeira, in September 2012. About 10 regional and local authorities, environmental groups and security forces have expressed curiosity about the outputs of the project and expectation facing its implementation in their respective areas of work and expertise, namely in the study of risk, conflict mitigation and resource in the use of cartography, data or models developed.

The sharing of information, dissemination of good practices, seen as a means of action and not as an end, show the need to work together, in a coordinated way towards better results for the governance of coastal areas, for the management of risks, to promote the development and sustainable use of these areas. Only a joint effort between all stakeholders in the governance of coastal areas shall place value on the resources and capabilities present in the territories, on

the waterfronts, in the local economy, mitigating conflicts, minimizing impacts and striving for a truly sustainable development.

Finally, as part of the dissemination of research results, it is urgent to shorten paths between research and its practical application in the territories. We must overcome the huge gap between academia and administration: national, regional or local. There is also the need to overcome communication barriers. Researchers should, therefore, involve stakeholders, technicians and decision makers in the identification of problems, the construction of scenarios, in a participated work that will surely result in a better and easier implementation, compared to the prior acquired knowledge. If one cannot beat the times that run between the period of investigation, European regulation, legal national transposition and real application in the territories, lost forever may be opportunities and resources essential to the promotion of local sustainability.

In the specific case of the SECOA project, and for the Municipality of Albufeira matter that the results, guidelines, and cartography and models produced will support current practices at the level of planning tools, civil protection, environmental management, in a clear support to the decision making, underpinned by technical and scientific bases, placed at the service of the territories, communities, and in this particular case, of coastal areas, seeking to induce an innovative urban management, safeguarding risk management and promoting the conflict mitigation.

5.1. References

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6. Eco Ocean, Marine Research and Education, NGO, Israel
End Users contribution to the dissemination of SECOA

Asaf Ariel

1. Explain the type of stakeholders the contributor is representative

I am representing a marine conservation organization (NGO) operating in Israel. The Israeli environmental movement comprises approximately 100 organizations, representing a few tens of thousands of members and activists. EcoOcean is a marine research, education and conservation organization, employing 11 persons, as an environmental civil society representative, EcoOcean believes in the right of the citizens for a healthy and accessible marine environment and strives to promote the conservation of the coastal and marine environments through research, education, & campaigning and promotion of a better sustainable management of these environments.

2. Illustrate the research and / or management that stakeholder plays.

As an NGO we usually do not take active management actions but we push and press the authorities to better manage the coastal and marine zones. An exception is a program we are now developing for the introduction of cooperative management of marine protected areas (MPA), which involves the active participation of the authorities, local communities, NGOs and commercial bodies. We also provide and assist academic and educational marine research and conduct independent research to support our conservation program (such as biodiversity monitoring, marine debris surveys, etc.).

3. Which are the suggestions that stakeholder poses for the calls for HORIZON 2020?

There are several issues which seem important and relevant in our view and that can be researched in the premises of Horizon 2020. The first is investigating mechanisms for marine and coastal management in a regional conflict situation. This is extremely relevant in the context of the conflict in the Middle East and the eastern Mediterranean, where recently large scale development of offshore gas and oil drilling has taken place. Another issue which seems relevant in the Mediterranean and in fact in all oceans and seas is the promotion of efficient marine protected areas. The situation today is that most of MPAs are in fact not managed and there is need to find new mechanism to sustainably manage and finance the operation of MPAs.

4. Horizon 2020, specific requests:

    - In the formulation and management of the budget
    - In the preparation of the research program

We think that, as end users, we can have an input on the research goals, so naturally we would be happy to take part in the formulation of the research program. We could also take part in the conduct of the research, if any marine field work will be included. We, as an NGO, also often contribute in the conduct of educational programs to the community, which are run as an addition to research programs.

    - In the management of the program
    - The publication of the results

As stated regarding SECOA, we can assist in the dissemination of research outcomes, results and tools, and also communicate these results to a wider audience if provided the ability to do so. Our website and other online tools we have as well as seminars, lectures and educational programs and also connection to other organizations can be used to communicate research to end users and the public.

5. In the project SECOA reference was made to a dissemination static and traditional, in which the information is transmitted by researchers to stakeholders, and a dynamic dissemination, in which the dissemination is realized in a reciprocal manner (researchers - stakeholders - researchers). Could the stakeholder give some comments?

I believe that any dissemination process of SECOA tools will have to include an on-going process of adjustments, updating and improvement. Users of the tools will probably have many technical questions regarding the use of tools, their significance, , etc. This means that the dissemination process will have to be dynamic with a 'ping-pong' between the researchers and the stakeholders. As I mentioned before, SECOA end-users could assist and be mediators between the researchers and the stakeholder, being familiar and involved with both the SECOA project and the stakeholder's arena, but this role of the SECOA end users must be encouraged and developed.

7. National Voice of Coastal Communities

Chris Blunkell

7.1. What can end-users contribute?

End-users can contribute, and to my mind have contributed, in a number of ways. We have done so formally – by working with research teams in identifying issues, by making presentations, by commenting on draft outputs and attending workshop meetings. This has allowed us to encourage researchers – and indeed other end-users – to consider the work of the project, and issues that attend it, from the perspectives of the interests that we as end-users represent. End-users also enjoy less formal contact with the project, and those who discharge it. Workshops have offered plenty of opportunity to talk around the work of the project with researchers from different disciplinary and national backgrounds.

Perhaps more specifically, I can cite my own experience of being both an end-user and a researcher on the project. My academic interest in this subject area was sparked by my experience of being a coastal dweller in the UK context subjected to precisely the kind of mediation between social, economic and environmental interests that sits at the heart of SECOA. Whilst it was my close and active involvement with the national lobbying group the National Voice of Coastal Communities (NVCC) that recommended me as an end-user, my resulting academic interest in the play of power in terms of mediation processes in distinctive locations saw me contribute to UK outputs. In so doing, I like to think I have made a contribution that extends the involvement of the end-user in directions compatible with the aims implicit in ideas of participatory research. On the one hand, the project might be said to benefit from the inclusion of such perspectives and, on the other, the end-user becomes more skilled and experienced as a research practitioner. I certainly feel that the latter applies in my own case, and I hope that my contributions have added fresh perspective to the whole – not least in ensuring that some of the realities of coastal change, as felt keenly by those of us who have enjoyed distinctive experiences in trying to influence policy, are acknowledged.

7.2. What we can provide

End-users can bring to bear a variety of disciplinary, sectoral, national, experiential and other perspectives. From my own experience of meeting with other end-users, I would observe that very few of us on this project have been from civil society – what we might call 'grass-roots' groups. In one way this makes a certain kind of sense in that government organisations and

NGOs, for example, are likely to be well-placed and sufficiently resourced to make use of project outputs in comparison to their civil society counterparts. However, this may also mean that the end-user contribution, seen in the round, may serve to reinforce the dominance of traditionally more powerful interests, and technocratic perspectives. I would like to see more use made of interests identified as marginal in terms of voice, with their development as cogent stakeholders a priority in terms of outputs.

7.3. What end-users expect from scenarios

I made the point during the Mumbai workshop that SECOA researchers must be wary of assuming that any additional decision-making capability offered by scenarios will translate necessarily into more transparent and better decisions – a key concern for the interests that I represent through my involvement as an end-user on behalf of NVCC. There is emerging evidence that populations at risk from decisions not to defend against the sea struggle to have their voices heard in decisions concerning coastal policy, and researchers must be mindful of the national and local institutional contexts in which scenarios are employed.

7.4. Recommendations

I dare say there is merit in those stakeholders for whom scenarios may prove useful in terms of determining coastal policy collaborating in its use. However, experience tells me that this is not likely to extend to grass-roots groups in the UK context, where the substantive parts of such calculations tend to be made by officials and their consultants, informed by the usual 'key stakeholders' behind closed doors. Rather, we seek mediation processes that seek to redress a balance of interests that currently favours those that are in step with central government preferences. The UK's policy with regard to coastal adaptation appears distinctive in heaping the risk of coastal loss onto the individuals involved, a situation that requires a revaluation of notions of equity and governance for meaningful redress to be achieved. I therefore recommend that further research might usefully compare relevant nation paradigms, with a view to exploring how more just solutions might be found.

CHAPTER 10.
General Conclusion

Towards the end of the period of validity of the FP7 , the European Commission has published some information on research institutes and universities who had won FP7 research projects that had been banned since the year 2007. It was found that the highest concentration of funded research has had in the metropolitan areas of Paris, Madrid and Rome. Certainly, these results are also due to the particular distribution of research institutions in France, Spain and Italy. In Paris 4381 projects were funded for a total of just under two billion euros. In Madrid 2545 projects for a total of EUR 800 million , and in Rome 2348 projects for a total of 703 000 million. If these cities there was an actual dissemination of scientific results should detect a particular situation of greater development of enterprises and society. For example, local governments should not make investments in research because they may benefit from the results without having to pay a Euro. Unfortunately this does not happen for various reasons. The first is certainly the responsibility of the researchers who are too locked in their academic worlds. Even the government does not try to take advantage of this favourable situation as there is concern that the researcher, from the top of his scientific authority, could also indicate a line to be followed to solve problems. Politicians and local authorities are afraid of these possibilities. There is also the lack of opportunities and opportunities for meetings between producers of research and the economic sectors that could benefit from it. In this situation, scientists should begin to worry the most about this situation. A society that does not see the results is likely to be reluctant to increase the research budget .

SECOA experience emphasized that scientific dissemination is facilitated as civil society has confidence in their leaders. When leaders have little power and a lot of authority stakeholders are more likely to trust in what the various sectors are able to offer. This refers not only to political leaders but also to academy members. Academicians who does not enjoy the confidence of the public are much more difficult to communicate the results of their researches. In this way, a negative cycle is triggered when a minor dissemination is followed by less availability of funds for research, and therefore less research and less scientific dissemination.

Scientists should consider anyhow dissemination a fundamental element of their activity and take a less prejudiced attitude to scientific communication, which has long been considered a secondary activity for scientists of inferior rank. The media, too, should stop considering dissemination solely from the standpoint of a news item. Research should not be considered a

finished product, to be publicised only when there is something concrete to present. It should be talked about throughout its duration, as a process that will achieve successful results, or potentially lead to further positive developments. The relationship between scientists and scientific communicators is key to improving the perception of science by administrators, who should ideally represent a culturally evolved society administrated by individuals with sufficient training and operational capacity.

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