Social Impact Ex-Post Evaluation Protocol

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Abstract
Measuring the societal impact of research has become a key issue in scientific research worldwide. Most competitive research funding agencies demand societal impact in research proposals. We must not only bring science closer to the public, but also make it improve the condition in which the science is found. But how can we measure the societal impact of a research once it has been completed? Through this article we present the Social Impact ex-post Evaluation Protocol (SIEP), a proposal of a tool to gather and measure the social impact of research. It is based on the qualitative work developed in the framework of NET4IMPACT, a Research Network on the Social Impact of Science. The work was developed applying communicative methodology, comparing across disciplines, and culminating in the establishment of a tool that can help in the measurement of societal impact from a great diversity of scientific areas.

Keywords
societal impact, communicative methodology, qualitative study protocol, measurement, sustainable development goals

Theoretical Background
Societal impact is crucial in competitive research developed internationally in the last decade. The most competitive research agencies consider societal impact as a critical element in the funding of their projects. In this scenario, the importance of establishing permanent research networks between experimental and social sciences to achieve societal impact is growing. Interdisciplinary research combining all sciences is a primary point for reaching societal impact. The European Commission, for instance, funds its projects based on three fundamental pillars: excellence, impact and quality and efficiency of the implementation (Flecha et al., 2015; European Council, 2019). Suppose projects submitted to EC agencies do not demonstrate that they will have a societal impact in their development (in-itinere), especially at their completion (expost). In that case, they will not be funded.

Concerning the second element, impact, the projects presented must demonstrate how they contribute to each of the expected outcomes and impacts mentioned in the strategic plan and the work programs under the relevant topic. The impacts are clearly framed in the benefits that society can obtain from the results of the projects, beyond academia and clearly differentiated from the dissemination of research results (Reale et al., 2018).

We conceptualize the societal impact of research when not only do we go beyond academia, but the results of any research published in scientific journals, disseminated, and transferred improve people’s lives by following the social objectives prioritized by citizens (Aiello et al., 2021). Internationally, these objectives are related to the 17 Sustainable Development Goals (United Nations, 2017); Along the same lines, the International Year of Basic Science and Social Development has been working on this year, 2022, and the next one. The ONU has launched this initiative, developed based on the SDG, encouraging exchanges between scientists and all stakeholders (including associations, students, and local authorities).¹

Therefore, social impact implies the prior dissemination of research results among the international scientific community.

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This prior step makes it possible for policy makers and the public to be aware of them. Secondly, it implies a transfer of the knowledge that has been disseminated, which occurs when policymakers and other social actors use it for social and political actions (Girbés-Peco et al., 2022).

Thus, showing the future societal impact that we will have with our research (ex-ante societal impact) is fundamental if we want to develop competitive research projects. This simple fact has caused research staff to seek strategies to ensure societal impact in developing their research proposals. If a research group or research staff demonstrates to have obtained societal impact with the development of their research, they have options to get national and international competitive funding. Therefore, orienting methodologies towards societal impact measurement is an increasingly relevant and challenging factor. In that sense, Bellavista et al. (2022) demonstrate how methodologies to engage citizens are crucial to advancing societal impact measurement.

With this scenario on the horizon, it is essential to have tools that allow us to evaluate/measure the societal impact of the research projects we carry out. Establishing these tools or strategies to measure the societal impact depends mainly on the procedures we follow in our research to obtain the impact. In other words, the methodology and how we approach the measurement of societal impact becomes a critical aspect if we want to ensure a positive impact on citizens.

The European Commission has financed research projects, such as IMPACT-EV, which make it possible to evaluate and measure the social impact of research (Sordé Martí et al., 2020). At first, the interest was particular since the objective was to have a system of indicators that would allow discerning which projects submitted to calls of the Framework Program could have more social impact. But these indicators have also served to try to measure the possible societal impact of a project in a more general way. This particular interest has been extrapolated, and many researchers have taken these indicators and methods to achieve societal impact for their research proposals (Reale et al., 2018). At the same time, researchers are also taking into account, along with these indicators and methods for obtaining societal impact, the achievement of the SDGs with research projects, as some funding agencies in European countries include the obligation to reach the interpretation of reality sustainable years after the project ends. These (KIP) have been the base of the final tool to evaluate the societal impact through the Social Impact Ex-post Evaluation protocol (SIEP) (Gómez & Soler-Gallart, 2022).

**Study Aims and Objectives**

The main objective of this study is to develop a tool to evaluate the societal impact of the research qualitatively. To establish the tool, the SIEP, developed under a communicative perspective, was established to guide the result towards measuring societal impact with a transformative orientation.

The research questions that emerged and guided the work were: Can we measure societal impact qualitatively? How do we qualitatively measure societal impact? Would it be possible to develop a tool that helps in this task? Would a communicative approach in developing this tool help us in its final realization?

To answer these questions, we set out three interrelated objectives:

- To collect and systematize available evidence on the societal impact of research.
- To apply a protocol to obtain a tool to measure the societal impact of research.
- To analyze the societal impact of research projects.

**Explanation and Justification of Method**

This protocol was developed using communicative methodology (Flecha & Soler, 2014). We apply this methodology because it is oriented to social transformation and several projects of the research framework program that obtained results of great societal impact used this methodology in their developments (Aiello et al., 2021).

The communicative methodology is based on seven postulates that focus on reaching the interpretation of reality...
through an egalitarian and intersubjective dialogue. (Gómez et al., 2006). The dialogues established in the different work sessions have respected the different positions of each participant, and each participant has been conceptualized as a transforming social agent (Puigvert et al., 2012). Hierarchical interpretations were broken by acting on the same epistemological level through communicative rationality. By proceeding in this way, knowledge was achieved in a dialogical way, and the resulting tool is the result of a genuinely egalitarian work oriented to understanding among people from very different disciplines (Roca et al., 2022).

Within the application of the communicative methodology, the communicative evaluation of social impact (CESI) has been kept in mind since it is a conceptualization totally in line with the methodology adopted for this study and oriented to evaluate the societal impact of the research. CESI implies, among other things, a participatory process involving all participants of the research through an egalitarian dialogue that makes it possible to recreate the results in different contexts (Puigvert et al., 2019). This development fits in with the approach we wanted to provide to our study since the goal lies in the application of the tool by researchers to measure the societal impact of their research works.

The communicative methodology is characterized by three elements that differentiate it from other methodologies oriented toward social transformation. Research using communicative methodology is organized communicatively, applies communicative data collection techniques, and analyzes the information communicatively. The communicative organization of the research implies promoting the participation of all the people involved in the research process from the beginning to the end through egalitarian and inter-subjective dialogue. Some of the strategies used in previous research, such as INCLUD-ED, have been establishing an advisory board, organizing groups of experts, and working groups on specific topics (Yuste et al., 2014). In the specific case of this research, as we will explain in the section on data analysis and research organization, a group of experts was organized and met from the beginning to the end of the process to define the societal impact analysis tool.

The communicative data collection techniques are the communicative discussion group (Ruè et al., 2014), communicative daily life story (Ruiz-Eugenio et al., 2020), and communicative observation (Aubert et al., 2011). The common point of all of them lies in the researcher’s role. Researchers bring to the egalitarian dialogue with the participants the accumulated theory on the problem under study. In this way, anyone without prior theoretical knowledge can link these data with their experiences and reflections.

In the specific case of this research, all the work meetings were carried out under a communicative orientation. Theoretical data and practical examples of societal impact assessment were provided and discussed from the point of view of egalitarian dialogue. No traditional data collection techniques were applied, nor was it necessary to select a sample for the development of the protocol. Both, the protocol, and the tool to measure the societal and political impact of a research, has been carried out by all members of the research team.

**Sampling/Recruitment**

A total of six professionals from very different areas of knowledge have participated in the SIEP and the establishment of the tool to measure societal impact of research. They all have been part of the network of excellence on the social impact of science (NET4IMPACT). The table below shows institutional affiliation and disciplines of the researchers who took part in the study. The diverse areas of knowledge are represented with a common objective: to develop research with societal impact that contributes to improving people’s lives (Table 1).

The recruitment process was totally intentional and based on the research team. The tool has been tested by implementing it to research projects, already finished, from the research institutions involved from different disciplines. In fact, its evolution has been a direct consequence of the way in which the tool has been completed in previous versions.

**Research Process and Data Analysis**

During the project many formal working meetings have been held and some informal meetings between some researchers to address specific issues related to the establishment of a tool to assess the societal impact of any research. Concretely, the tool has been established after the application of the SIEP. Three working meetings were held with all research members and two small meetings to work more specifically in how to apply the tool in engineering and ecology projects.

The communicative analysis of the information was carried out from the first provisional chart to measure the societal impact on the final one. Following the communicative analysis of the information, the data were processed based on the exclusionary and transformative dimensions. The exclusionary dimension is conceptualized as all those barriers that make it difficult to overcome problems. On the other hand, the transformative dimension is understood as all those actions that help to overcome these barriers (Pulido et al., 2014).

In the specific case of this study, the exclusionary dimension included all those issues that hindered the analysis of the societal impact of any research project. All the comments and analyses that led to establishing the tool that measures societal impact were added within the transforming dimension. The analysis was oriented toward the transformative one. Therefore, the transformative dimension is the one that guides the whole process. However, within the process, detecting exclusionary elements to discuss and overcome them was a vital issue for obtaining the final tool.

The research was organized in a communicative way (Munte et al., 2011), with an expert group formed by all the project researchers. All interactions were based on an
egalitarian and inter-subjective dialogue, where decisions were made by consensus and always based on the best arguments. In this process, the seven postulates of the communicative methodology were followed, achieving objectivity through this inter-subjective dialogue (Aiello & Sorde-Martí, 2021).

In the first work meeting, information was presented regarding different ways to measure the societal impact of the research, as well as some practical examples of how to do it through different competitive research projects. The report “Monitoring the impact of EU Framework Programmes” promoted by the European Commission was especially

| Table 1. Researchers Taking Part in the Study. |
| Institution | Expertise |
| Community of research on excellence for all (CREA). University of Barcelona | Sociology |
| Institute of mathematical sciences (ICMAT). CSIC madrid | Mathematics |
| Power supply systems (SEA) research group. University of Oviedo | Engineering |
| Catalan institute of human paleoecology and social evolution (IPHES) | Prehistory |
| Center for ecological research and forestry applications (CREAF) | Ecology |
| Educational research methods with social impact (MEDIS). University Rovira Virgili | Education |

| Table 2. Project Data. |
| Project title and acronym | Area of knowledge | Financing agency | Start and end year |

| Table 3. Addressing Global Challenges. |

Is the Project oriented towards any of the SDGs? If yes, please specify which goals it is oriented towards. If no, does it focus on other goals/ international agendas (specify)?

Has the project generated scientific outputs in line with the SDGs? If yes, please briefly describe each scientific production and its relation to the SDGs

Check: Yes or No

Has the transfer of the results a positive effect related to the SDGs or other related issues?

Check: Yes or No

aTo access the SDGs visit: https://sdgs.un.org/es/goals

bPreferably scientific articles or, if not, documentation from official agencies. This orientation is maintained for all times when evidence/sources of data are requested.

| Table 4. Citizen Involvement. |

Has the Project involved citizens (enterprises, associations, foundations) in the co-construction of knowledge during the research? Check: Yes or No

Have companies, entities, administrations, developed mechanisms for citizen participation and engaging with the knowledge/product beyond the end of the Project? Check: Yes or No

Have citizens used the knowledge or product or implemented activities using the research results? Check: Yes or No

| Evidence/data sources |

Information on the entity (whether companies, administrations or civil society organizations) Description of the mechanism

Evidence/data sources

Evidence/data sources

Evidence/data sources

Evidence/data sources

Evidence/data sources
highlighted. Within this report, the four KIPs were taken as the basis for constructing the tool. Within each pathway, the information on how to achieve societal impact gradually, from the short to the long term, was discussed.

The result of this first working meeting was the establishment of four social impact measurement tables plus another one containing primary data identifying the project and seeking to measure its societal impact. These first charts followed the model of the monitoring report, highlighting the concepts of replicability and sustainability, but without explicitly collecting information on the short, medium, and long-term impact.

This first working document was tested by testing the information on the societal impact of a 6th Framework Program project that had achieved very positive results in its development. Some shortcomings were detected in the charts explaining the societal impact. At the second meeting, the four charts were presented with the example already filled in, and the specific problems encountered by the team that prepared the first one was discussed. The main problem was the level of abstraction of the charts, as they were directly related to the four KIPs. Without controlling the primary bibliography on societal impact and having worked on the subject concretely in research projects, it did not seem very quickly able to successfully use this future tool for people who did not have this previous work base. The tool has always worked to be simple in its application so that people not so well versed in the subject can apply it to get a concrete idea of whether their project has had a societal impact.

At the end of the second meeting, the chart was modified, and it was decided to check it using projects carried out by members of the research team. Thus, the form was tested through seven research projects in engineering, ecology, social sciences, and palaeontology. Two ad hoc meetings were held between the people who developed the first chart and those working on the engineering and environmental projects when the records were applied. Despite the improvements introduced in the second meeting, new doubts arose when assessing the projects’ societal impact using the charts.

The main barriers to the completion of the chart focused on three issues: the interpretation of some headings, which were still too abstracted to be applied; the duplication of some information in two of the four tables that were part of the chart; the interpretation of citizenship and its involvement in the development of projects when these are in areas such as engineering.

After these doubts were raised in a small committee, a third meeting was held to close the societal impact measurement chart definitively. With the seven completed charts from different disciplines, the tool was discussed for the last time and finally closed and applied to a final social science project. Below, we present the tool agreed upon after the SIEP’s application.

**Tool to Measure Societal Impact**

This section presents the tool developed from the Social Impact ex-post Evaluation Protocol (SIEP). It is a tool to collect, as systematically as possible, the societal impact achieved by research conducted in different areas of knowledge. It consists of two sections. The first provides the essential data identifying the project. The second consists of data
and evidence on the processes leading to the project’s societal impact. This second section includes three tables, which are based in the “Key Impact Pathways” defined in the report “Monitoring the Impact of EU Framework Programmes” to achieve societal impact of the research. Keeping these pathways in mind before the research is carried out can significantly help the subsequent achievement of societal impact; they can be used to establish possible indicators to measure the future societal impact that can be achieved with research.

Each of these pathways differentiates between scientific knowledge achieved and how it is transferred and has societal impact on citizens. This way of collecting the results of a research project corresponds to its measurement in the short, medium, and long term. First, the scientific knowledge achieved is collected and how it is transferred to the public, which citizens can also use for their benefit. The information collected can then be included in repositories designed to show the societal impact of scientific research (Table 2).

This first table includes the title of the project with its area of knowledge, funding agency, and project duration. This minimal information would be essential if we want a project to be considered for inclusion in an institutional repository on societal impact. Previous versions of the data sheet contained more data than the final one, but to be more direct, we reduced it to these four pieces of information.

**Societal Impact**

Next table provides information on the link between the SDGs and other internationally recognized objectives and the project’s objectives (Table 3). In the theoretical background, we have already stated the importance of responding to objectives set by the citizenry, which show the improvements achieved by the project. The way to demonstrate societal impact is to relate each result obtained to those objectives set by the citizens. It is not enough to obtain our research objectives if they are not oriented to the SDGs or similar ones. Our research must be in line with citizens’ social demands since it aims to improve their lives. In this sense, although the SDGs are essential to the survival of society in general, it is always crucial that research reaches citizens in some way, passively and, where possible, actively.

Once the SDGs or other similar ones have been related to those of the project, a double step is taken:

1. Specify whether results have been obtained in line with the SDGs through a brief description of how they have been obtained and their relationship with each of the SDGs.
2. Delve into how the results have been able to be replicable and sustainable over time. This second step usually implies a longer-term societal impact, as it requires the transferability of its results to other contexts and that they can be sustainable over time. If the results of a project endure over time, they acquire greater relevance, and if they can be replicated in a diversity of contexts and areas of knowledge, even more so.

The most important is to provide concise narratives of the results and specially to highlight the issue of transferability by addressing the replicability and sustainability of these results. To support the reports, it is essential to provide evidence and data for each of the results reported. This evidence may include scientific articles or other productions that denote the importance of these results.

The following table shows information on how citizens participate in research (Table 4). This is a crucial process in achieving societal impact and one that many government agencies that fund international projects focus on when providing resources.

After the last meeting, citizen participation was conceptualized comprehensively since projects in areas such as engineering do not have the traditional participation of citizens in developing a product, as is the case in other areas of basic research. Research personnel in areas such as engineering collaborate closely with companies, associations, or foundations that come to represent the agents of society during the creation of a specific product.

The co-construction of knowledge occurs among a great diversity of people. Companies are part of the citizenry since they have workers who are part of it. Therefore, the citizenry participates as potential workers and consumers of the products. That way, there is double participation as an active agent and consumer. As a result of the co-creation work established during the project, the product is gestated and materialized, then marketed by the company. Citizens then participate as consumers of the product. The societal impact achieved with the project will depend on the product’s success if its consumption positively impacts citizens in line with the SDGs.

Thus, this table shows citizen participation broadly understood in three phases or moments:

1. Explaining how citizens have been involved in co-creating knowledge or specific products during the research is necessary.
2. The explanations focus on how companies, entities, or associations have promoted people’s participation at the end of the research, providing data on the participating entities and the type of activities carried out.
3. Data on how people can use the research results through diverse activities are provided.

Therefore, the importance of the stories, and the explanations, falls on two moments, during the research (corresponding to an in-itinere societal impact), at the end of the research (ex-post societal impact), and highlighting how people make the knowledge or the realization of products their own through the organization of activities.
This last table focuses on how to capture the political impact that a project can achieve upon completion (Table 5). A distinction is made between international, national, and regional/local impact since projects can vary in depth and scope. The first step is to explain the concrete political results descriptively achieved by the project and provide supporting data. Secondly, it is a matter of providing data on how political decision-makers have been reached, how they have been made participants in the research results and providing data on the interactions produced. Finally, it is a matter of providing data related to political documents that concretely cite the project results. This last description is directly related to the previous step, the interactions with politicians since these interactions often lead to these political documents.

The information presented in this last table is of great importance since the availability of policy documents based on research results allows us to speak of a longer-term societal impact and to have greater possibilities of transferring the results to broader and more diverse contexts.

### Rigor

Rigor is assured following the communicative approach adopted during the entire research process. Through this approach, a collective interpretation of reality is reached based on the best arguments from all the people who participated in the research activities. Rigorous control of all the work sessions and small committee meetings has been carried out, ensuring that the seven postulates of the communicative methodology have complied at all stages.

Rigorously is also achieved due to the communicative construction of knowledge, where research personnel contribute all their scientific knowledge and make it available to the public. Objectivity is achieved by the egalitarian and inter-subjective dialogue among all participants (Gómez et al., 2006). The diversity of people involved in their areas of expertise managed on equality has been critical in achieving the tool.

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### Notes

1. [https://www.iybssd2022.org/en/home/](https://www.iybssd2022.org/en/home/)
2. The fourth Key Impact Pathways are: (1) achieving missions; (2) creating value for EU citizens; (3) addressing societal challenges; (4) supporting policy-making.
3. The postulates that guide the implementation of the communicative methodology are: The universality of language and action; Individuals as transformative social agents; Communicative rationality; Common sense; No interpretative hierarchy; Same epistemological level; Dialogic knowledge.

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