

Policy Brief: In depth analysis of the outcomes of collaboration within the framework of FP7 and bilateral programmes

Qualitative outcomes assessment study within the framework of the Indo-European collaboration

Main author: Teresa de Oliveira
Contributor: Franz Paul Mayer

Main author(s): **Teresa de Oliveira** – Centre for Social Innovation (ZSI), Vienna with the contribution of **Prof V.V. Krishna**, and **Mr Rajiv Mishra**, Centre for Studies in Science Policy, Jawaharlal Nehru University (JNU), New Delhi

Contributor: Franz Paul Mayer (ZSI)

Editorial assistance: Carmen Heidenwolf (ZSI)

Proof reading: Francesca Brizi

Legal notice: © 2017 INDIGO POLICY projects

All rights reserved. This publication may be reproduced, distributed, or transmitted in any form or by any means, including photocopying, recording, or other electronic or mechanical methods, only with the prior written permission of the publisher. The author(s) are solely responsible for the content of this technical report. Furthermore, the technical report does not necessarily reflect the official position of the European Commission.



INDIGO POLICY has received funding from the European Union's Seventh Framework Programme for Research, Technological Development and Demonstration under Grant Agreement No 609535.

Date of publication: April 2017
First edition

TABLE OF CONTENT

| | |
|---|-----------|
| LIST OF ABBREVIATIONS | 04 |
| ABSTRACT | 05 |
| INTRODUCTION | 06 |
| 1 SETTING THE CONTEXT OF THE ANALYSIS | 07 |
| 1.1 INTERNATIONAL RESEARCH COLLABORATION BETWEEN INDIA AND THE EUROPEAN UNION | 07 |
| 1.2 AN INSTITUTIONAL PERSPECTIVE ON INTERNATIONAL RESEARCH COLLABORATION | 09 |
| 1.3 MEASURING THE OUTCOMES OF COLLABORATION: CHALLENGES AND PARTICULARITIES | 10 |
| 2 METHODOLOGY | 12 |
| 2.1 SEMI-STRUCTURED INTERVIEWS AS RESEARCH METHOD | 12 |
| 2.2 DEVELOPMENT OF THE QUESTIONNAIRE | 12 |
| 2.3 SELECTION OF PROJECT COORDINATORS AND PARTICIPANTS | 13 |
| 2.4 DATA PROTECTION AND PRIVACY ISSUES | 14 |
| 3 EXPLORING THE OUTCOMES OF THE PROJECTS FROM A MULTILATERAL AND BILATERAL PERSPECTIVE | 15 |
| 3.1 ADVANCEMENT OF KNOWLEDGE BETWEEN INDIA AND THE EUROPEAN UNION: KEY FINDINGS | 16 |
| 3.3 DIFFICULTIES IN CREATING ECONOMIC UPTAKE IN THE INDO-EUROPEAN COLLABORATION: KEY FINDINGS | 23 |
| 3.4 THE LACK OF POLICY UPTAKE IN THE INDO-EUROPEAN COLLABORATION: KEY FINDINGS | 26 |
| 3.5 THE IMPORTANCE OF EU FUNDING IN ADDRESSING COMMUNITY BENEFITS, INCLUDING THE RELATIONSHIP BETWEEN INDIA AND THE EU: KEY FINDINGS | 29 |
| CONCLUSIONS | 32 |
| BIBLIOGRAPHY | 33 |
| ANNEX: QUESTIONNAIRE | 39 |

LIST OF ABBREVIATIONS

| | |
|--------|------------------------------------|
| CORDIS | European Union Open Data Portal |
| EC | European Commission |
| EU | European Union |
| FP | Framework Programmes |
| FP7 | Seventh Framework Programme |
| R&D | Research & Development |
| STI | Science, Technology and Innovation |
| ZSI | Centre for Social Innovation |

ABSTRACT

This study examines and monitors the impact of the cooperation between India and the EU to obtain further in-depth information and insight on a broad range of project outputs. A qualitative design is used to understand the project coordinators and participants' views within the umbrella of the Seventh Framework Programme and bilateral programmes.

The results prove positive outcomes in terms of advancement of knowledge, both at bilateral and European level in the fields of Water, Energy, Health, Social Sciences and Humanities, as well as, the enhancement of EU-India international research collaboration. Conversely, the economic outcomes and the level of policy uptake are considered to be very limited.

This study concludes that the Seventh Framework and bilateral programmes are an excellent avenue for the enhancement of bilateral collaboration and strengthening of international research collaboration between India and the EU.

INTRODUCTION

India and the European Union (EU) have been important research and innovation partners since 2001 and the collaboration is significant, both at EU level and at bilateral level, in the field of Science, Technology and Innovation (STI). This policy brief presents the analytical results of a study comprising interviews with project coordinators and project participants under the umbrella of the Seventh Framework Programme (FP7) and bilateral programmes in selected EU Member States.

The study adopts a qualitative approach, and monitors the outcomes of the cooperation between both regions. The objective of the study is to obtain further in-depth information and insight on a broad range of project outputs, including: 1) advancement of knowledge; 2) interregional knowledge and knowledge transfer; 3) economic outcomes; 4) policy outcomes and 5) community benefits (including the development of EU-India partnership).

The first part of this report presents background information about the theoretical and methodological framework for the study, as well as, some of the key challenges identified by the literature on outcomes assessment and evaluation of EU funded projects.

The second part of the report presents the results of the interviews taking into consideration the five elements mentioned above.

The conclusions highlight the main results of this ex-post qualitative outcomes analysis.

1 SETTING THE CONTEXT OF THE ANALYSIS

1.1 INTERNATIONAL RESEARCH COLLABORATION BETWEEN INDIA AND THE EUROPEAN UNION

International research collaboration is defined as a joint research activity with a common aim or shared objective (Katz and Martin, 1997; Shrum et al., 2007) among scientists based at public research institutes in different countries and regions across the globe. Under this definition lies the concept of deep collaboration involving a division of labour and creative contributions from all partners, rather than weaker forms of collaboration (Laudel, 2011).

Since this concept can be defined differently, depending on the area of study, this policy brief will be looking essentially at international research collaboration within programmes whose *raison d'être* is to foster global cooperation in research through project support (Georghiou, 1998), which is the case of the Seventh Framework Programme.

As identified by Georghiou (1998), the concept of international research collaboration is particularly relevant to our study and can be operationalised in different formats, including: researcher exchange; formal intergovernmental agreements on scientific cooperation; meetings and workshops; international large-scale facilities, collaborative projects, publications, and the establishment of laboratories. The international research collaboration can also be measured through co-publications and collaborative projects. Co-publications, for instance, are considered to be key indicators in helping to define strategic international research collaboration, and they are used as one of many proxies for the assessment of the status of collaboration in science.

In the case of Indo-European collaboration, which is the main focus of this study, co-publication data is particularly important. Several bibliometric studies have shown that the annual number of India-Europe co-publications has rapidly increased in the past decade. In fact, the figures have quadrupled over this period of time (Granqvist and Büsel, 2015). Europe is the most important co-publication partner for India, even ahead of the United States.

As regards the collaborative projects, a testament of India's growing strength as a research and innovation partner to the European Union has been its participation in the EU's Framework Programmes for Research and Technological Development¹ since 2002.

As mentioned above, India and the EU have become important research and innovation partners. India participated in 181 FP7 projects and the European Commission's contribution received by Indian participants was approximately €35.8m. India's participation in the FP7 has significantly increased compared to previous Framework Programmes (FP). The

¹ As this regard, INDIGO POLICY also published a Policy Brief entitled: "Horizon 2020 Opportunities for India". Within this paper, chapters 1 and 2 give a clear picture of India's participation in FP7 and Horizon 2020 until November 2015. For further information: <https://indigoprojects.eu/object/document/210>.

number of Indian participants in FP6 (2002-2006) was 142, and this more than doubled in FP7 (2007-2013), which counted 305 Indian participants. The highest degree of cooperation is in the Health and Knowledge-Based Bio-Economy fields. Other active cooperation thematic fields are Environment, Security and Social Sciences and Humanities.

Considering the level of international research collaboration between both regions, this framework of collaboration is very useful for monitoring the outcomes of collaborative projects, not only for the purposes of evaluation programmes and accountability, but also to demonstrate the value of research investments.

However, as pointed out by several scholars and studies (Morton, 2015; European Science Foundation, 2012), assessing the impact of the outcomes of projects is challenging, mainly due to the considerable difficulties encountered in collecting data (both in terms of quantity and quality) for projects' outputs and effect, as well as problems regarding the interpretation of the data gathered (European Science Foundation, 2012).

According to several authors regardless of the framework or model used, effective impact/outcomes assessment requires a good and clear understanding of the research cycle: what the results (outputs and outcomes) of the research are, how the results are used and applied by the end users and what impact the results can have on both academic and non-academic spheres (Guinea et al., 2015).

For instance, the methodologies and approaches currently used by the European Commission (EC) to evaluate Research & Development (R&D) actions (individual projects and programmes) are standardised for ex-ante project evaluation (selection of the best proposals) (Guinea et al., 2015). As reported by several scholars in the field of evaluation (for the interim and ex-post evaluation of projects or programmes), the methodologies employed vary enormously (Piric and Reeve, 1998; Reeve, 2010) and there are no specific methodologies to monitor and assess R&D projects and actions.

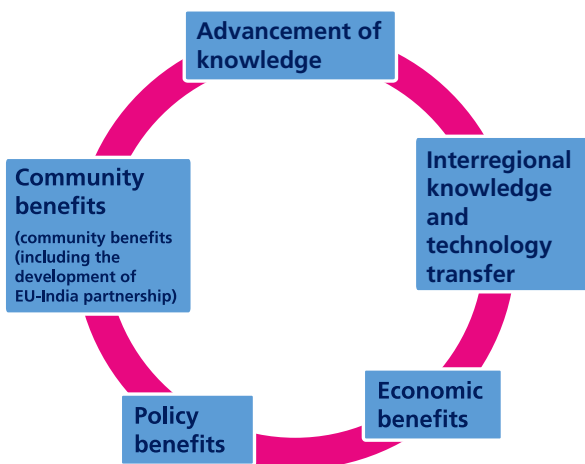
Moreover, several of the methodologies and approaches used by the European Commission to evaluate R&D actions are focused on quantitative analysis, essentially measuring programme expenditure and performance (European Commission, 2015a).

Our study adds a new dimension to the understanding of outcomes of the FP7. Using the qualitative approach, it assesses the important outcomes of FP7 funded projects and (to a lesser extent) bilaterally-funded projects. In the study, five key dimensions of analysis were defined, covering a large range of project outputs, including:

- Advancement of knowledge;
- Interregional knowledge and technology transfer;
- Economic benefits;
- Policy impacts;
- Community benefits (including the development of EU-India partnership).

These five dimensions served as guidelines for interviews, combining cooperation-related impact dimensions with more directly research-related ones according to Becker's model (Bernard Becker Medical Library, 2014).

Figure 1: The five key dimensions for the outcomes assessment study.



In addition, a mid-range theory building up from aggregate empirical data has been applied to this study, aiming at integrating theory and empirical research to explain a specific set of phenomena (Merton, 1968).

The next section presents the theoretical framework applied to this study.

1.2 AN INSTITUTIONAL PERSPECTIVE ON INTERNATIONAL RESEARCH COLLABORATION

The literature on institutional perspective explains and captures the landscape of formalised programmes and the agreements in the field of Science, Technology and Innovation. The Institutional perspective is based on the assumption that science and technology policy strategies manifest themselves in specific goal-oriented and purposely planned activities (Loudin and Schuch, 2009) and this can be measured at different levels at national and international level, within different scopes and sizes.

According to T. Parsons (1990), institutions are systems of regulative norms, which steer social and institutional behaviour. For Hubner and Nill (2001), the term "institution" means broadly defined norms, habits, practices, rules and regulations that "direct" interactions of groups. These institutional rules and procedures are to be considered conditions that can facilitate certain activities and prevent other potentially meaningful activities. From this theoretical framework viewpoint, the European Frameworks Programmes for Research and Technological Development are therefore considered in this policy brief as main institutions of systems of innovation. Indeed, formalised research in the form of national and international programmes can be considered one of the main institutions of a system of innovation.

As part of systems of innovation, the Framework Programmes have been a constituent part of the European research and innovation policy since their introduction in 1984 and they have been changing, adapting and introducing in new strategic objectives over time. The programmes were originally conceived as research support mechanisms to foster scientific excellence and industrial competitiveness in Europe and over time

have evolved into a more sophisticated set of instruments supporting certain socio-economic objectives. The latest FPs appear to have shifted their emphasis from supply-side factors to diffusion-oriented projects, with a greater focus on learning skills and increased knowledge diffusion among Europeans and researchers from other countries (Aimilia et al., 2010).

The Seventh Framework Programme was designed with the aim of encouraging scientific and technological collaboration among organisations originating from all European Member States and open to participation of third countries, such as India. It brought about a new perspective on innovation, seen therefore, as a complex, interactive knowledge-sharing process that involves a wide set of heterogeneous actors. This perspective is based on the understanding that the EU programmes provided a legal framework for cross-country, cross-region, and cross-institutional collaborative agreements, which may encourage at the same time, introducing new difficulties for collaboration (Luukkonen, 1998).

According to the European Commission, the FP7 has five main objectives: 1) Promoting excellence in research; 2) Fostering competitiveness and economic growth; 3) Contributing to solving social challenges; 4) Strengthening the human potential and researchers' mobility; 5) Fostering transnational research cooperation. Its overriding aim, as set out in the European Parliament Decision No 1982/2006/EC1, was to contribute to the Union becoming the world's leading research area. The task of the FP7 was also to strengthen industrial competitiveness and to meet the research needs of other community policies. In achieving this aim, the programme has focused on promoting and investing in world class state-of-the-art research, based primarily upon the principle of excellence in research (European Commission, 2015b).

The next section presents the challenges and particularities that need to be considered when measuring and assessing the outcomes of the FP7 and bilateral (to a lesser extent) projects.

1.3 MEASURING THE OUTCOMES OF COLLABORATION: CHALLENGES AND PARTICULARITIES

There is a substantial body of literature on impact/outcomes assessment, and monitoring of research programmes and projects, some of the most important being: Horton et al., 1993; Fayl et al., 1998; Georghiou and Roessner, 2000; van Raan, 2000; Millstone, Van Zwanenberg and Marshall, 2010; Link and Vonortas, 2013².

Other evaluations put their emphasis on evaluating the impact and outcomes of research in general (Grant et al., 2010; Bornmann, 2012; Council of Canadian Academies Expert Panel on Science Performance and Research Funding, 2012) or in specific areas, such as Health Research

2 Cited in Guinea, J. et al. (2015, February 02): Impact oriented monitoring: A new methodology for monitoring and evaluation of international public health research projects. Oxford Academic, p. 131-145. [Online] <https://academic.oup.com/rev/article/24/2/131/2364625/Impact-oriented-monitoring-A-new-methodology-for> - accessed: February 02, 2017.

(Hanney et al., 2004; Banzi et al., 2011), Agriculture (Horton et al., 2007) or Environmental Research (Boaz, Fitzpatrick and Shaw, 2009)³.

Despite the large number of tools and diverse methodologies on impact and outcomes assessment, there are important challenges⁴ previously studied by several authors (OECD, 2008; Morgan et al., 2013; Penfield et al., 2013) that are largely related to the following issues:

- Attribution: determining the contribution of specific research projects (as opposed to other factors) to the expected long-term impacts;
- The dynamic nature of impact, as impact changes over time and these changes can result in an increase or decrease in the degree of impact;
- Problems with the interpretation and accessibility of data (Kerssens-van Drongelen and Bilderbeek, 1999; Leitner and Warden, 2004);
- The impacts of R&D activities are quite often manifested only after a certain time lag (Kerssens-van Drongelen and Bilderbeek, 1999; Leitner and Warden, 2004);
- Some impacts of the projects are simply intangible in nature. For example, learning experience, social cultural exchanges and changes, institutional and non-institutional cultural changes, expansion of knowledge, are indeed difficult to measure, quantify and capture;
- Each R&D project is unique and affected by cultural and contextual features – producing different kinds of impacts, outcomes and externalities and therefore, generally, a fixed set of indicators cannot totally capture the different outcomes of the projects;
- The R&D projects tend to produce a wide range of outcomes and impacts, including unexpected slipover effects and it is, to a certain degree, difficult to anticipate all potential and possible impacts being produced (Vuolle et al., 2014). For example, the applied R&D projects, in particular, take place in a real-life context, where there are countless factors affecting the same business and technology environment that is being impacted by the R&D initiative;
- R&D projects tend to produce a multitude of direct and indirect effects. The measurement and the monitoring have to take into account the direct and indirect cause-effect mechanisms and map the different forms of value generated through the project in accordance with a particular stakeholder's point of view (Vuolle et al., 2014).

The next section provides a brief introduction to the methodology framework used in the study.

³ Ibid.

⁴ Ibid.

2 METHODOLOGY

The study employed a qualitative approach, using semi-structured interviews as a research method, followed by subsequent content analysis of the interviews. The semi-structured interviews were conducted with project coordinators and project participants from India and the EU within the FP7 and under bilateral projects in the field of Water, Energy, Health, Social Sciences and Humanities.

2.1 SEMI-STRUCTURED INTERVIEWS AS RESEARCH METHOD

As mentioned above, semi-structured interviews were used to gather qualitative information from the project coordinators and project participants. Conversation situations were set up (the interview) that allowed respondents the time and scope to express their opinions and perceptions on international research collaboration, more specifically, their outcomes. After the interviews were completed, we compared the findings and extracted valid generalisations.

Semi-structured interviews have the benefit of permitting the necessary flexibility to allow following interviewees' relevance structures rather than our own. In addition, we pre-defined some key impact and outcome dimensions of interest for our analysis, structuring the guidelines for the interviews (combining cooperation-related impact dimensions with more directly research-related ones according to Becker's model (Bernard Becker Medical Library, 2014).

We interviewed twenty-five project coordinators from India and the European Union under the umbrella of the FP7. Additionally, interviews with project coordinators from different European Member States (e.g. Austria, France, Germany, Netherlands, and Portugal) were also included in this final study. A total of thirty interviews were carried out.

2.2 DEVELOPMENT OF THE QUESTIONNAIRE

The study was conducted by two different teams: one in Europe and another in India. The research team in India was coordinated by the Professor V.V. Krishna⁵, from the Centre for Studies in Science Policy, Jawaharlal Nehru University, based in New Delhi, India, together with the assistance of Mr Rajiv Mishra, from the same research centre. This team carried out interviews with Indian project coordinators and project participants within the FP7. Moreover, the team in charge of interviewing the European project coordinators was the Centre for Social Innovation (ZSI) in Vienna, Austria.

5 Professor V.V. Krishna - Centre for Studies in Science Policy, Jawaharlal Nehru University.

In addition, questions and methodology were elaborated jointly and implemented between September 2015 and November 2016. ZSI developed a preliminary draft of the questionnaire, with the question set being designed to address the various information requirements contained in the INDIGO POLICY description of work, and focusing on elements that could not be answered by the quantitative analysis of participation data. In particular, the questionnaire was designed to elicit a more detailed understanding of the extent to which outcomes of FP7 can be assessed as well as to provide evidence of the outcomes of the EU-INDIA STI collaborative projects.

The first draft questionnaire was prepared in August 2015, and sent for comments to the team involved. A number of revisions were then made based on the feedback received. The final version of the questionnaire consisted of 20 open-ended questions, the responses to which were recorded in the interview notes. All interviews were conducted either by Skype or phone.

A complete version of the final version of the survey questionnaire can be found in the Annex.

2.3 SELECTION OF PROJECT COORDINATORS AND PARTICIPANTS

The selection of project coordinators and project participants was conducted by the responsible team in charge of the implementation of the study.

The team based in Europe, the Centre for Social Innovation, took as a sample the dataset from the European Union Open Data Portal (CORDIS) and selected project coordinators and project participants from projects connecting India and the EU. A list of selected projects related to the three main areas of Water, Energy, Health, was chosen, as these are considered key areas of collaboration between both regions⁶.

The CORDIS dataset contains projects funded by the EU under the FP7 from 2007 to 2013. The information provided in this portal contains grant information for each project, including reference, acronym, dates, funding, programmes, participant countries, subjects and objectives (European Union Open Data Portal).

Additionally, for projects at bilateral level, diverse funding agencies were contacted in different EU Member States and projects were selected on the basis of thematic area and year of implementation. We targeted the same areas as those selected for the FP7, meaning Water, Energy, and Health, implemented during the period from 2007 to 2013. Different funding agencies in Austria, France, Germany, Netherlands, and Portugal were contacted and key outcomes are included in this study.

⁶ It was decided to include one project in the field of Social Sciences and Humanities.

2.4 DATA PROTECTION AND PRIVACY ISSUES

Confidentiality in the restitution of the results was applied to this study. As a matter of fact, project coordinators and project participants requested that their names remain unnamed. As anonymity of participants and confidentiality are central to ethical research practice in social research, this study does not disclose any information regarding personal data, institutional affiliation and any other information.

Moreover, it was assumed that participants would be more likely to provide honest responses if their identity (name, address, institution of affiliation, and contact details) was not going to be revealed.

Project coordinators and participants were required to volunteer and disclose information about outcomes of the projects implemented under the umbrella of FP7 and the bilateral programmes of some selected countries (Austria, France, Germany, Netherlands, and Portugal).

Therefore, for this study, it was decided to protect research participants and to honour trust between the interviewer and interviewees and follow the European Code of Conduct for Research Integrity 2011, as well as, the Guidance Note for Researchers and Evaluators of Social Sciences and Humanities Research 2010. An internationally-recognised and globally-accepted standard (such as ISO/IEC 27001:2005) was applied by Social Sciences and Humanities team engaged in the implementation of the study (European Commission, 2009).

In addition, participants were informed about the purpose of the study and gave full consent to be interviewed. The principle of informed consent expresses the belief in the need for truthful and respectful exchanges between social researchers and the interviewees whom they study.

The next section presents the main results of the in-depth analysis of the outcomes of collaboration within the framework of FP7 and a number of bilateral programmes between India and the European Union.

3 EXPLORING THE OUTCOMES OF THE PROJECTS FROM A MULTILATERAL AND BILATERAL PERSPECTIVE

This third section presents the results of the interviews with the project coordinators and project participants under the FP7 and a number of bilateral programmes between India and the European Union. However, the focus of this part is on assessing the outcomes of collaboration under the FP7.

As a general sampling characterisation, the vast majority of individuals interviewed were project coordinators⁷ from both regions. In Europe, only project coordinators of EU-funded projects were interviewed, whereas, in India, the interviewees comprised both project coordinators and project participants. All in all, most of the project coordinators and project participants were male, and were involved in different areas such as Water, Environment, Health, Health Management issues, Water purification, and Water treatment.

In addition, most of the interviewees had been involved in scientific collaborations prior to the EU-funded projects. It seems that for both European and Indian researchers, collaboration established under the FP7 was a way to operationalise and continue the scientific collaboration that existed in another format, for example, at bilateral level. This result reinforces what several studies have already confirmed, which is that successful collaboration prompts further successful collaboration (Katsoulacos, 1994; Georghiou, 1994).

The interviews with project coordinators from different European Member States showed that they had long-standing scientific collaborations with India in the fields Water, Energy, Health, Social Sciences and Humanities. The EU-funded projects allowed them to work further and gave them the possibility to contributing to solving important societal challenges in those fields.

As for the Indian researchers, some had previously been involved in collaborative activities with Europe. Some of the Indian experts interviewed in this study had previously been working in industrial and scientific collaborations with EU countries, notably with France, Germany and Portugal.

Under the FP7, for instance, they had access to a pool of research networks that had not been accessible to them under the bilateral level format. The bilateral programmes involved a small group of scientists and the funding volume was less attractive compared to FP7.

The results of the interviews suggest that the EU funding acted as catalyst in the creation and re-invention of networks in an international dimension, from which both sides, India and the European Union, benefited equally.

⁷ Project coordinator – the person leading the project team and coordinating the project and all matters related to the project content, including project implementation.

The content analysis of the interviews also shows that, in general, the interviewees' response was very positive. Overall, from the Indian side, the project coordinators and members of the consortium associated with EU-related projects gave a very positive response, indicating that the projects gave them good exposure to EU-based scientific institutions and researchers. The European side also reported a generally positive experience on being associated with Indian research teams and the possibility to be involved in significant research challenges in the field of Water, Energy, Health, Social Sciences and Humanities.

The following section describes acquisition of new knowledge and advancement of knowledge as the main outcome of Indo-European collaboration under the FP7.

3.1 ADVANCEMENT OF KNOWLEDGE BETWEEN INDIA AND THE EUROPEAN UNION: KEY FINDINGS

For this specific dimension, we were mainly interested to know about the project's major findings, as well as, the concrete benefits resulting from the project in terms of new knowledge.

The analysis of the interviews suggests that the FP7 had very positive outcomes and results in terms of scientific excellence and technical advancement. Indian and European research teams seemed to benefit from the consortia, both scientifically and technically, and the consortia tended to be conceived on the basis of knowledge-sharing and equal footing.

Almost all the projects in our sample may be characterised as research projects and applied projects. Indian scientists stated that projects were not so much about advancing a piece of frontier knowledge. They rather emphasised how the projects enabled them to address a problem in the specific Indian context.

From the European side, it was mentioned that partnering with India brought complementarity and a better understanding of a number of specific challenges. In the FP7 project context, advancement of knowledge often led to acquisition of new perspectives on joint problems and the development of joint solutions. The FP7 projects helped to strengthen knowledge, to enhance scientific and technical capacities and support the development and implementation of effective tools, methods and services in both regions.

The analysis of the interviews with project coordinators and participants also suggests that the enhanced skills in international collaboration learnt from the EU projects would facilitate future international collaboration efforts and further enhance the acquisition of new skills.

Another important positive effect is related to the promotion of collaborative networks between Europe and other regions of the world among new configurations of partners: i.e., FP7 projects helped to create a community of professionals sharing a knowledge base and trusting each other, and this can be confirmed by the voices of the coordinators.

As one project coordinator from the EU said:

"This FP7 project in particular, gave me the possibility to work with Indian scientists in one area that is crucial for India, that is Health, and universal and equitable access to health care and health financing (...), we have put together a very good consortium to tackle and develop a community-based health insurance model."



European researcher and coordinator of a FP7 project.

An Indian researcher highlighted the real complementarity of the consortium, as shown below:

"I learnt a lot with this consortium and with this project, [...] and we were here sharing knowledge and techniques that otherwise wouldn't be possible. European and Indian sides were sharing their expertise on the basis of equal partnership. There is no such thing that Europeans have more knowledge than Indians, and Indians are there to provide specific expertise. Not at all. We exchange, we share and have create new knowledge and new technologies".



Indian researcher and project participant of a FP7 project

And, as one consortium member from a FP7-funded project sharply observed:

"In terms of advancement of knowledge, there has been number of fallouts, no doubt, that, this project has improved our own knowledge but has helped to generate a transnational repository of data and facts related to Himalayan Rivers of India, Nepal and Bangladesh. The generation and collection of empirical evidences, facts and scientific data, further helps in deployment of knowledge in other areas which are similar to this research and development".



European researcher and coordinator of a FP7 project.

Similar responses were recorded from other projects related to Water. An Indian researcher noted that:

"In terms of knowledge advancement we learnt in an integrated manner. Our expertise was more into engineering and technology, but with the help of this project we learnt a lot about natural water sciences and more specifically science of natural water purification and filtration".



Indian researcher and coordinator of a FP7 project

Staff of other projects also outlined that the knowledge advancement led to acquiring new perspectives. A scientist from an Indian scientific institution revealed that the EU-funded project provided an *"excellent opportunity for learning and acquiring knowledge. We not only learnt and acquired knowledge but we also shared"*.

Many researchers involved in this study clearly stated that the international network allowed a circularity of knowledge and knowledge-sharing with not only researchers but with a pool of different of stakeholders as well.

As one Indian researcher emphasised unequivocally:

"This project was for me as coordinator simply great, as Indian researcher living abroad and having the possibility to tackle challenges not only important for Indian but as well as for the world. In the framework of this project, we are currently studying the role of technology and innovation to attain the Millennium Development Goals, and the corporate social responsibility of firms with respect to innovation".



Indian researcher and project participant of a FP7 project

Another project coordinator of a FP7 project mentioned that:

"Our collaboration with India is driven exclusively with the idea of excellence and solving societal and scientific problems. For us, and for our university, there is a growing interest in collaborating with India and their knowledge in the field of Energy. We have been learning a great deal of knowledge that otherwise would be more difficult to manage".



European researcher and coordinator of a FP7 project.

Another European researcher pointed out that in his view, the collaboration with Indian researchers clearly led to *"gaining new knowledge on the water management system in India; the performance of the natural treatment on water in India; the social environment of the project; excellent personal and scientific collaborations between some others colleagues and me".*



European researcher and coordinator of a FP7 project.

The importance of a EU project for the advancement of knowledge and its importance in contributing to solving pivotal challenges for India in the field of Maternal Health were also stressed by another European researcher. According to one European coordinator:

"I believe that with this project we achieve a great deal for India, we are trying to develop strategies for improving reproductive health and this is very beneficial for women and for the communities".



European researcher and coordinator of a FP7 project.

For other projects, advancement meant also an exchange of views and networking. A scientist from an Indian top research institution highlighted that the project provided a *"good opportunity for learning and meet other people all across Europe and working all in all crucial issues for both regions, and concentrating knowledge resources for both regions".*



Indian researcher and project participant of a FP7 project

The different interviews strongly emphasise the positive impacts of the FP7 on the reinforcement of scientific knowledge and networks through different channels. Indeed, there is a plethora of literature on the impact of EU-funded projects on strengthening and expanding networks all across Europe and globally (Aimilia et al., 2010; European Commission, 2016). The content analysis of this study confirms there is general agreement that the networking effects and the inspiration received from others members of the different networks serves to enhance researchers' own activities, and they are one of the most important and positive effects of participation.

Several researchers interviewed in this study use superlatives to describe how much they appreciated the effects of scientific exchange and networking (“tremendous effect, huge impact, largely impressive”), in the framework of the FP7.

Another positive outcome outlined by Indian and European researchers was the fact that there is a certain degree of direct cascading between projects; these networks are embedded in, meaning that one project leads into another. For most of the researchers, the results of the projects led to a continuation of the network established under the FP7 and bilateral programmes.

It seems that the FP7 was felt to be a unique opportunity for Indian participants to leverage all of the European Research Area’s research infrastructure and expertise, while it gave their European counterparts access to many of the top institutions in an exciting emerging knowledge area. In fact, according to the Indian participants, the FP7 had a substantial impact, as it brought them added size and scope to research networks, increasing quality and including them in a more EU network.

The results of this study suggest that international research collaboration played a crucial role in meeting the challenges for science and knowledge, by gathering scientific expertise, identifying, clarifying and tackling global challenges such as Water Supply and Water Management, to the benefit of both regions.

The next section describes the outcomes of the EU projects with a focus on technology transfer and inter-regional knowledge perspective.

3.2 TECHNOLOGY TRANSFER AND INTER-REGIONAL KNOWLEDGE: KEY FINDINGS

According to the literature, the EU Framework Programmes are clear promoters of STI collaboration and are the cornerstone of Europe’s innovation policy (Hoekman et al., 2009; Scherngell and Lata, 2013), particularly as they stimulate the recombination of knowledge across technological, social, institutional and organisational boundaries and strengthens the knowledge productivity of and between regions. Moreover, the definition of technology transfer described by Bozeman (2000) places emphasis on the sharing of technology, technique or knowledge and also as the movement of know-how, skills, technical knowledge or technology from one organisational setting to another.

It is important to note that when we applied the filter of inter-regional knowledge and technology transfer to our study, all project coordinators and project participants mentioned that in general, the EU-funded projects have made a positive contribution to the sharing of knowledge, information, and capabilities, even if these two regions are not geographically close to each other.

Generally speaking, the content analysis of the interviews shows that the interaction between these two regions had certainly impacted possibilities for learning and exchange and had globally improved their knowledge of a particular issue.

In this regard, one project coordinator highlighted the following aspects:

"Now that you are asking these questions, I had never thought about this [...] but the fact that we are very far away from Europe and from the coordinator of this project, we have been exploring other rules and procedures that we were not considering at the time. I am pretty sure that the same happened with Europeans. We had very specific tasks in the projects and sometimes it is very hard to change some rules inside our own organisations. With this particular project, we had managed to learn, exchange, we share all kind of skills and competencies".



Indian researcher and project participant of a FP7 project

In the same vein, another European researcher stated that:

"The good thing about this project is that we had internalised certain rules and procedures and it might be difficult to change and improve after all [...] when we are exposed to international collaboration, we learn how to do things in another way and (...), all in all, we have created interesting networks and managed to spread the acquired knowledge".



European researcher and coordinator of a FP7 project.

Additionally, another researcher also pointed out that both teams were involved in a project in which the production of knowledge was equally distributed:

"Indians were fully involved; joint experiments and joint workshops; India has a long history using technologies for the use of natural ways of water treatment. This project was not a project of technological transfer between Europe and India; this was a joint proposal and they were on the same footing; the project has been important for us for Indian side".



European researcher and coordinator of a FP7 project.

However, there were divided opinions among project coordinators and project participants. Some positively emphasised the enhanced sharing of knowledge and interconnection of networks between India and the European Union, whereas, some others had different perceptions, and stated that it was actually difficult to get connected and share the knowledge. More concretely, if we take a closer look at the technology transfer within the projects we studied, it seems that only few projects were actually able to transfer knowledge into the market.

Some projects also highlighted the need to make sure that the EC evaluators paid greater attention to the evaluation and inter-linkage between different stakeholders in the consortium. One particular European coordinator mentioned the following:

"This project was very problematic from the very beginning. One of the partners, the Indian⁸, this agency was implementing the trials schemes together with the NGO's; they have a role of the evaluation that costs a lot during the implementation of the pro-



European researcher and coordinator of a FP7 project.

⁸ All projects, names of persons and institutional affiliation remain confidential, as it was mentioned in the methodological considerations.

ject. This (...) agency was implementing those schemes in the field and didn't like to have and see some negative results; and some point, the communication just stopped. I believe that the European Commission and the evaluators must pay more attention in the future, because it was very difficult for us to implement the project, considering all these problems. Imagine that, we must implement the trials in India, and it simply doesn't work because they didn't like the results, it was very frustrating for me as coordinator, considering that one part of the deal was falling to the ground".

Several project coordinators and project participants revealed that the EU-funded projects worked well within the perimeter of the project itself, but failed to create a self-sustaining network of stakeholders.

The observation below illustrates this limitation:

"We worked well together, there is no doubt about it; but if you asked if other scientific communities were aware of the results, they were not".



European researcher and coordinator of a FP7 project.

Another comment illustrates the challenge for some project coordinators to spread the knowledge outside the consortium:

"We were not able to reach and spread our own knowledge outside the consortium, and we tried, I can guarantee. For instance, our results were publicised on the website of the European commission and I, as coordinator, tried to reach some companies, I would say green companies and some specific industrial sectors. Of course that I know that some other teams in the world are currently working on alternative energy crop for biofuel production, but nowadays there are no companies that will invest money and time on the production of alternative energies".



European researcher and coordinator of a FP7 project.

The same views were shared by Indians in FP7 projects:

"The results of our project didn't lead to creation of new agreements or even or not take up by another team, as far as I know. The companies were not that much interested in our results and therefore we only published papers and we attended some conferences in Europe".



Indian researcher and project participant of a FP7 project

Additionally, one of the problems addressed by several interviewees was the difficulty in engaging with the local stakeholders. One of the EU project coordinators interviewed mentioned the following:

"For me as coordinator it was extremely difficult to meet the local communities, I don't know if it was because of the way the project was designed, or simply because the project was not giving importance to this dimension. As a coordinator, I do believe that it is important, to share our knowledge with the locals, in an open and transparent way, without intermediaries. In our case, this never happened. For the future, before the project is designed, we must



European researcher and coordinator of a FP7 project.

verify the need to properly engage with the local communities; entrepreneurs; universities; covering the whole chain. If we want results with the EU money, we must carefully assess the needs and engage with the right stakeholders."

Another researcher pointed out the lack of "high-impact logic" that would allow the prioritisation of the right stakeholders and the promotion of a close dialogue with them:

"The project was implemented for almost 3 years and we did the final conference at the end of project. Relevant people were there, the dialogue was interesting but minimal without the possibility to talk with those who can actually decide and allocate financial resources for it."



European researcher and coordinator of a FP7 project.

Despite the limitations cited, the literature on the subject shows that one of the positive effects of EU-funded projects is the reinforcement of human capital and movement of people. This is clearly indicated by several authors, notably Hoekman et al. (2005) who argue that labour flows and movement of people also are important means of technology transfer and are an essential part of it.

In this study, it was emphasised that the inter-regional collaboration was enhanced by the inter-linkage of different pools of competences and resources. The following example illustrates exactly this:

"I honestly think that with this project this was a win-win situation. They had their own technologies and knowledge that are very different from ours. Both partners could take advantage of each other. We are in a temperate zone and Indians they are in a tropical zone and therefore we gained from their knowledge and them from us."



European researcher and coordinator of a FP7 project.

As identified by Aimilia et al. (2010), the impact of EU Framework Programmes has been addressed in several studies since 1980. Thus far, there is no direct evidence to confirm their contribution to the enhancement of industrial competitiveness of Europe, which is their major aim. However, there is enough evidence that demonstrates that they had generally positive impacts on sharing knowledge (Barker and Cameron, 2004). As our study also proves that the FP7 played a role in the enhancement of knowledge capabilities and skill sets, technological learning, access to complementary expertise and the formation of new networks, factors which appear to be more prevalent than direct and transferable outputs.

The next section describes the outcomes of the EU projects in terms of the economic uptake in the FP7.

3.3 DIFFICULTIES IN CREATING ECONOMIC UPTAKE IN THE INDO-EUROPEAN COLLABORATION: KEY FINDINGS

For this dimension of the outcomes assessment, the economic benefits are looked at in terms of four major dimensions: a) creation of new products and services; b) establishment of new business opportunities; c) creation of new jobs and d) innovation activities generated by the project and from international collaboration.

The majority of the European and Indian researchers interviewed emphasised that the projects were not able to create any service, product or substantial business opportunity during the lifetime of the project or after its completion. This is particularly true for most of the projects under the FP7 umbrella.

As stated by one of the European researchers and project coordinators:

"These new materials are not profitable yet; the industrial companies they are not yet interested in these kind of projects (...). We had in the consortium, one big German company and they went several times to India, Mexico and Brazil, but nothing relevant has happened there."



European researcher and coordinator of a FP7 project.

In the same vein, another European researcher and project coordinator at bilateral level revealed that:

"In our case, this is was not intended, the project was a research project, we did a lot of conferences, and publications, but we had no impact when it comes to jobs and products to the market, and as far as I know, a lot of FP7 and bilateral projects were about advancing our own knowledge about one particular question and not applied to the market".



European researcher and coordinator of a FP7 project.

Another researcher pointed out that *"in our case this was not foreseen to create any service, product or whatever: our main contribution was at policy level and science level"*.

European researcher and coordinator of a FP7 project.

This issue was also addressed by another project coordinator that stated *"economic outcomes of the project are very small, because the main point of the project was not transfer of any results nor create new jobs or services"*.

European researcher and coordinator of a FP7 project.

Only a small amount of projects led to the creation of products or new services. It seems that the projects were originally not business-oriented, and it was very difficult to transfer key scientific results into the market, and most of the projects were not able to establish business opportunities during the implementation process.

However, others EU project coordinators mentioned that have contacts working in the private and corporate sector and some of the results of the project were close to being taken to market as services and products.

In particular, one European coordinator stated the following:

"Some of our findings were very interesting for companies and all over the project we had contacts with a lot of companies. As we were developing the water production system, we were in touch with medium-sized companies that were interested in water modelling tools, and some of our broad knowledge, is closer to the market and some companies both in Europe and India are interested. They were concretely interested in natural treatments components. No doubt that some of the results and methods can be applied in India and in Europe."



European researcher and co-ordinator of a FP7 project.

The dominant trend in this sample of projects is that few jobs are being created as a direct result of FP7 projects between India and the EU in the field of Water, Energy, Health, Social Sciences and Humanities. These results are not surprising, as it is widely recognised from previous studies that there has only been moderate success in developing commercial products, services and processes through the Framework Programmes (European Union Committee, 2006).

Yet, the innovative features are fully embedded in the projects and knowledge-sharing among the project partners between both regions. As was pointed out by an Indian project participant of a EU-funded project in the field of Water:

"With the knowledge and an experience gained from this EU project related to river bank filtration technology, we are looking to potential sites throughout the country which could be feasible and practical to implement this technology, (...). And we haven't stopped here; we have as well other types of spin-offs related to new course curriculum in Master's Research at our university in India, we are trying to innovate on all fronts."



Indian researcher and project participant of a FP7 project

Innovations in learning emerged as one of the results of the EU projects and bilateral programmes. One member of staff of an Indian University clearly stated that this international collaboration had strengthened their capacity of innovation and concentration of knowledge, opening new areas of collaboration in which innovation and knowledge transfer was part of it.

In this connection, one Indian project participant stated:

"I have learnt about temperature sensors and also how small tools and equipment are used for temperature sensing of water beneath the surface of the river and we have changed some of our approaches to our local needs. Therefore, the innovation is an essential part of our work and brings new ideas for solving real problems, as we are really engaged on doing research for helping and change people's life and not only focused on market needs. (...), therefore this collaboration between India and the EU was



Indian researcher and project participant of a FP7 project

very valuable. There is, absolutely no, doubt that this collaboration has helped us very much, to get more and good ideas on our core research activities and definitely the innovation approach that is within."

Below, an Indian researcher involved in a EU project related to Marine research area also highlighted the value and scope of Indo-European collaboration:

"Within this network of different researchers, as other insights from this project indicated the major fall out of EU based workshops and training programmes enabled the scientists to learn more about the operation of EU-purchased equipment. Additionally, a major spin-off that has resulted from this project has been the establishment of the Laboratory for Marine Eco-System. This type of insight led us to point out that international transfer of knowledge is in many ways embedded not only in getting aware of new technologies for their operation, but as one of the scientists from our project, sharing of knowledge, association of networks is achievements of this project (...) it has helped in training and capacity development."



Indian researcher involved in a EU project

Another EU researcher pointed out the most important indirect benefits of the EU-funded project, emphasising the reinforcement of skills and knowledge as a clear impact of the project:

"For me, as project coordinator, even if we were not able to create jobs, services or any kind of concrete market outcomes...but for us was far away more important to advance our main knowledge, share different points of view, as well as having funding for sending researchers and young students to attend international events, and exchange between different communities, and this is for me this is innovation and great things came out from here."



European researcher and project participant (FP7)

Despite the abundance of evidence relating to the lack of economic uptake from the FP7 projects, the results of this study suggest that there are in fact a number of different 'indirect payoffs'. One of them is innovation, as it seems to be embedded in the activities of the projects, enabling those involved to gain access to new knowledge and technology, as well as, fostering collective learning processes and development of international networks.

The next section presents the results linked to the lack of policy uptake.

3.4 THE LACK OF POLICY UPTAKE IN THE INDO-EUROPEAN COLLABORATION: KEY FINDINGS

One of the dimensions that project coordinators and project participants identified in the framework of the FP7 as being neglected was the outcomes at policy level. Within this dimension, two main questions were asked: was policy-making in Europe or India aware of your results? Did the project's findings feed into policy activities or result in policy changes? Did the project lead to the creation of new scientific agreements or political agreements between both regions?

The vast majority of the project coordinators outlined that the policy-makers and decision makers both in Europe and India were not aware of the results of the projects. Most of the project coordinators from the EU clearly revealed that this dimension was not that important to them, and added that they considered the community of policymakers to be inaccessible to most of them. Several coordinators expressed their views in this issue:

"As a coordinator, and the whole group, never clearly thought about this, or, we didn't have any kind of strategy for addressing and developing a communication with different stakeholders, including the policymakers both in Brussels and New Delhi. I have never met them, to be totally honest. Our project was dealing with environmental issues and we were not involved with policymakers. In theory, we should have met some of them at least the Ministry and even someone at national level, but this was never the case. So, to answer precisely your question, I think you are right, we could have thought and planned to meet this people, but honestly I am a scientist, and it took already a lot to write proposals and all the management issues that this was enough for me. But in the end, we had as well all the reporting to the European Commission and newsletter to send out, but no one ever asked about the results of the project."



European researcher and project participant (FP7)

Another EU coordinator stated that he has no idea whether his project has led to any change at policy level:

"Concerning the European side, I am not sure if we were able to have any kind of results at policy level; we sent the projects results to the European Commission and to some private European companies; but we had no feedback. Concerning the Indian side, I know that they have some follow ups at national level, but I am not able to precise exactly. I know that the Indian Ministry of Science and Research was there at the final meeting, but I really have no idea about policy level and if our results had somehow contributed to change of the state of play."



European researcher and project participant (FP7)

As far as policy-community engagement is concerned, none of the project coordinators were ever contacted by decision-makers, either from India or from the European Union. However, this was hardly surprising, since the vast majority of the coordinators had never contacted any policymakers and decision-makers with the aim to influencing policy.

More precisely, of the whole sample, only one project coordinator mentioned that he intended to seek the advice of the policymakers for future funding opportunities between India and the EU and informed them about the concrete results and impacts of the project in the given field.

Indeed, this in-depth qualitative analysis showed that there is a general lack of awareness and communication between policymakers and the community of researchers involved in FP7 projects. The lack of collaboration and dialogue between the different stakeholders, scientists and policymakers is one of the key results to emerge from our studies. It seems that there are no channels available for the exchange of information, either during the project lifetime or after project completion.

One project coordinator pointed out the following:

"In reality, we would have liked to have some discussions with policymakers in Europe and in India, but actually this was not possible. We have finished the reports and sent it out to the European Commission and nothing happened in this regard. I know as well that the partners from India had talks with their own ministry, but nothing has happened since then. Of course, we did some conferences and different people were there but I am not aware if our results have had an impact at policy level. I think that it would be good that the European Commission decides whether they expect from us a certain impact at policy level."



European researcher and coordinator of a FP7 project.

Another researcher mentioned the following:

"This is a very good question, overall during the project we wanted to have had an impact at policy level and change the rules of the game both in Europe and India. I have worked with Europeans many times, not only in the framework of bilateral level, Germany, France and Spain. I always had struggled with rules that are very hard to comply with if companies and researchers wanted to put into the market new products and new services but the rules are so strict. We can innovate if then the circle it is closed at some point. In our projects, we wanted for instance to have easy access to research of other countries, exchange material that is currently very complicated, we would have liked to show our results to decision-makers, regulators and policymakers, not only to present the results as well as to show them that their rules are sometimes outdated and they are counterproductive both in Europe and India, when it comes to put services and products into the market."



Indian researcher and project participant of a FP7 project

The previous comments clearly reveal that there is a need to institutionalise the consultation process between research communities and policymakers in the framework of EU-funded projects. The project coordinators and project partners interviewed in this study expressed the wish to have continuous contact with the community of policymakers and decision-makers – (those who are actually in charge of designing and implementing the STI collaboration programmes), and establish a process of consultation and dialogue through formalised direct contact with interested parties.

The results of this study also encourage the European Commission to communicate more consistently with the project coordinators when it comes to discussing, measuring and assessing the potential policy im-

pacts of EU-funded projects. The consultation and dialogue process that is suggested by project coordinators and project participants of EU-funded projects would provide opportunities for input from different stakeholders, regional and local authorities, ministries from both Europe and India, from academics, technical experts, and interested parties, including those from third countries.

Possible channels for interacting with policymakers are also suggested by the European and Indian researchers interviewed. **One European project coordinator clearly stated:** *“University relations offices should be open to engage with different stakeholders at EU level and as well as third country level”.*

In terms of determining whether the FP7 projects had led to the creation of new scientific and political agreements between both regions, it seems that no additional scientific agreements were created. However, it is important to underline that at bilateral level, the results are different.

As already stated, in addition to various India-EU multilateral collaborative projects, there are also several bilateral S&T collaboration projects with several EU member countries. The most notable Indian joint collaboration is with France, and Germany and United Kingdom (Krishna and Mishra, 2016). As a matter of fact, the project coordinators from France and Germany mentioned that their projects led to the signing of new bilateral scientific agreements. In particular, both projects were very successful and both parties wanted to continue expanding the collaboration in their particular fields (Water and Energy). One project coordinator at bilateral level expressed the following view:

“We have been collaborating with the Indian colleagues at all levels, including training of young researchers and enhance as well the scientific mobility between France and India. Our government has put an emphasis on mobility programmes and we are very happy about it. In the recent past, we had excellent collaboration with other third countries, notably Brazil. But now France has some resources for India and we take obviously advantage of this.”

One of the positive externalities of the projects, both on a bilateral and a multilateral level, was without any doubt the mobility and exchange of scholars and scientists. There is a positive response with regard to mobility and exchange of scholars, students and researchers among Indian and EU-based institutions. The EU and bilateral projects generated considerable interest and motivation for research by providing mechanisms for exchange of personnel.

As general a conclusion, it can be assumed that the challenge of ensuring an adequate policy follow-up of project coordinators during the project lifetime and even after the completion of the project should be carefully examined by the European Commission. By fulfilling its duty to monitor, the European Commission would then be given the possibility of helping to improve the quality of the policy outcome and equally, by enhancing the involvement of all parties involved in the process. In other words, the analysis of the interviews clearly suggests that some measures should be taken to strengthen the principles of dialogue and feedback, leading to a stronger link between the Commission’s impact assessments procedures and the project coordinators.



European researcher and coordinator of a FP7 project.



French researcher and coordinator of a bilateral project between France and India

The following section presents the results of the interviews regarding the importance of EU funding in addressing community benefits, including the relationship between India and the EU.

3.5 THE IMPORTANCE OF EU FUNDING IN ADDRESSING COMMUNITY BENEFITS, INCLUDING THE RELATIONSHIP BETWEEN INDIA AND THE EU: KEY FINDINGS

The benefits resulting from the EU-funded projects in the field of Water, Energy, Health, Social Sciences and Humanities have been significant in addressing key societal issues in India. Several EU and Indian project participants and coordinators mentioned that the EU funding was very important since it contributed substantially to tackling important issues for both regions.

A number of comments are reproduced below:

"I believe that with this project we achieve a great deal for India in the field of Water".

European researcher and coordinator of a bilateral project between France and India

"This project was very important to India, but not only; to Europe as well. We tackled scientifically speaking important subjects for India on Energy matters and developing new devices to be further implemented in the field of Water in India, and for us Europeans it was very important too as we could have a different approach and in the end this is very positive for both regions as very probably we will continue working together in the near future."



European researcher and coordinator of a FP7 project.

For the Indian researchers interviewed in the study, the features of satisfaction were evident, as confirmed by the interview extracts below:

"For our team this project was very important, the funding beyond the opportunity was so valuable that it is a clear pity that the EU has now changed the rules for the participation within the framework of Horizon 2020. The funding behind the network allowed us to work with a great team of European researchers and this was as valuable for them, as it was for us. Moreover, this project had a clearly impact on our young researchers; they were involved since the very beginning. All in all, this experience with EU-funded projects was very positive and we are thrilled to work with Europeans."



Indian researcher and project participant of a FP7 project

Another dimension worthy of note is the strength of STI partnerships forged in the course of FP7 projects. The project coordinators and participants remarked that the most positive output of the collaboration was the reinforcement of partnerships to tackle global and societal challenges. The FP7 projects were tools for the enhancement of inter-sectorial scientific dialogue between India and the European



Indian researcher and coordinator of a EU funded project

Union. One of the Indian researchers who had participated in a FP7 project stated the following:

"For us, the project had a very positive impact, this type of insight lead us to point out that international transfer of knowledge is in many ways embedded not only in getting aware of new technologies for their operation but as one of the scientists from the project, sharing of knowledge, association of networks is the best achievements of this project...the expertise gathered here in the consortium was simply amazing."



Indian researcher and project participant of a EU funded project

The research within this framework of FP7 and bilateral programmes proved to be a global endeavour that has greatly contributed to the achievement of societal goals as confirmed by a significant amount of researchers. According to the European Commission, Science, Technology and Innovation are fundamental drivers of sustainable growth as they develop new and more sustainable ways to satisfy human needs and empowering people to drive their own future. The Science, Technology and Innovation policies are thus considered by the European Commission to be the keystones for making the EU the global frontrunner of sustainable development (European Commission, 2015c).

Another important element is the overriding importance of building strong partnerships with appropriate framework conditions as the basis for effective enhancement of bilateral relations between India and the European Union.

The results of the interviews suggest that India and the EU should pay greater attention to the frameworks conditions in which the international research collaboration takes place. As the following project coordinators carefully pointed out:

"For me, as a European project coordinator, it is better to work with those that are driven by advancing a piece of knowledge, and the right framework to collaborate in terms of funding. Let's be very honest, if people don't have the appropriate framework, from both sides, they will seek the financial arrangements to collaborate and they will simply look for other sources of funding."



European researcher and coordinator of a bilateral project between France and India

In addition, the Indian researcher expressed that the multiplicity of funding will bring additional challenges to the EU-INDIA STI collaboration. This is one of the key topics that were addressed by the EU and Indian participants:

"I haven't yet submitted any project with Europeans on Horizon 2020, and it is not that clear for me how India will proceed with Europe on collaborative projects. We were used to the EU funded rules and requirements, and from one moment to another, they have changed the rules. This is a real pity, and now we, Indians, have to submit one proposal to Indian ministry and then another to Europe. This could have been avoided. For us, Indians, the resources from the EU funding was very much appreciated. Pity that all is gone."



Indian researcher and project participant of a EU funded project

The FP7, whose structure and procedures made it accessible to international collaboration, has added new opportunities for international stakeholders in both academic and technological fields and has the potential also to contribute to the enhancement of specific Sustainable Development Goals, relevant for both regions, such as Good Health and Well-being; Clean Water and Sanitation; Affordable and Clean Energy and Partnerships for the Goals.

CONCLUSIONS

This study clearly shows that EU funded projects generate a number of positive effects in terms of strengthening scientific excellence between India and the EU, notably, the advancement of state-of-art research in the field of Water, Energy, Health, Social Sciences and Humanities.

The FP7 proved to be an excellent opportunity for Europeans and Indians to address key societal challenges by gathering a community of knowledge holders and allowing the exchange of knowledge.

From the Indian side, there was a positive response from the project coordinators and participants associated with EU-related project as this gave them a good exposure to EU-based science institutions and researchers. Overall, the European research teams had a positive experience with Indian research teams and they highlighted the opportunities to become involved in finding solutions to significant research challenges in the field of Water, Energy, Health, Social Science and Humanities.

The results per dimension show that both sides perceived the advancement of knowledge as a very positive outcome of the projects. The FP7 projects helped to strengthen the knowledge, thus enhancing scientific and technical capacities and supporting the development and implementation of effective tools, methods in both regions.

In most cases, a win-win relationship was established, where Indians and Europeans research teams seemed to benefit from the consortia both scientifically and technically. However, some challenges were identified, such as, the difficulty in engaging local stakeholders from the Indian side and the fact that the projects did not generate any technology transfer.

In addition, most of the project addressed important issues for communities, but concrete results were scarcely obtained at this level. This is likely due to the significant lack of proper linkage with local stakeholders, as well as, lack of policy follow-up between India and the EU. It seems therefore that the dimension of policy impacts was clearly neglected in many EU funded projects. The scientific findings of the FP7 projects also did not feed into any policy activities, nor did they result in policy changes. Some project coordinators did not know where to send the project results.

As regards economic benefits, these projects did not lead to the creation of products or new services. However, since the projects were not actually originally intended to be business oriented, it was very difficult to transfer key scientific results into the market, and most EU funded projects were not able to establish business opportunities during the lifetime of the project.

The key findings of the qualitative outcomes assessment study suggest that the Indo-European collaboration within the FP7 framework was a very worthwhile experience for both regions in terms of exchange of knowledge. It also identified a number of other challenges that need to be addressed by the policymakers, such as featuring local engagement in future collaborations and avoiding multiple funding sources.

In conclusion, the results of this outcomes assessment study confirmed the importance of India as a strategic partner to the EU in the field of Science, Technology and Innovation. The FP7 projects have exceptionally enhanced the framework of collaboration, and international collaboration in particular, with unique outcomes which are beneficial for both regions.

BIBLIOGRAPHY

- Aimilia, P.**, et al. (2010): Policy-driven collaborative research networks in Europe. *Economics of Innovation and New Technology*.V. 19, 4. pg. 349-372. Doi:10.1080/10438590902833665.
- Angiolillo, S.**, et al. (2017, March 31): Policy Paper: Horizon 2020 opportunities for India. Highlighting a Number of Instruments and Options that can increase India's Horizon 2020 Participation. Inno Indigo Policy Website. [Online] https://www.zsi.at/object/publication/4382/attach/INDIGO_Policy_Report_H2020_A4_HF.pdf - accessed: February 05, 2017.
- Bahadur, C., Kruk, M., and Schmidt-Traub, G.** (2005): Preparing National Strategies to Achieve the Millennium Development Goals: A Handbook. UN Millennium Project. [Online] http://www.unmillenniumproject.org/documents/handbook111605_with_cover.pdf -accessed: February 03, 2017.
- Banzi, R.**, et al. (2011): Conceptual Frameworks and Empirical Approaches Used to Assess the Impact of Health Research: An Overview of Reviews. *Health Research Policy and Systems*, vol. 926. [Online] <http://health-policy-systems.biomedcentral.com/articles/10.1186/1478-4505-9-26> - accessed: February 03, 2017.
- Barker, K. and Cameron, H.** (2004): European Union science and technology policy, RJV collaboration and competition policy. Y. Caloghirou, N.S. Vonortas and S. Ioannides (eds.), *European Collaboration in Research and Development*. Cheltenham: Edward Elgar: 154-186.
- Beaver, D. D.** (2001): Reflections on scientific collaboration, (and its study): Past, present, and future', *Scientometrics*, 52: 365–77.
- Bennagen, P.** (n.d): The Philippine Council for Sustainable Development. Working draft. [Online] <http://www.ids.ac.uk/ids/civsoc/final/philippines/phl9.doc>. - accessed: February 04, 2017.
- Bernard Becker Medical Library.** (2004): The Model for Assessment of Research Impact is a Framework for tracking Diffusion of Research Outputs and Activities to locate Indicators that demonstrate Evidence of Biomedical Research Impact. Washington University School of Medicine. Website. [Online] <https://becker.wustl.edu/impact-assessment> - accessed: February 03, 2017.
- Bizikova, L.**, et al. (2014): Participatory Scenario Development and Future Visioning in Adaptation Planning: Lessons from experience: Part I. IISD. [Online] <https://www.iisd.org/publications/participatory-scenario-development-and-future-visioning-adaptation-planning-lessons-part-i> - accessed: February 03, 2017.
- Boaz, A., Fitzpatrick, S., and Shaw, B.** (2009): Assessing the Impact of Research on Policy: A Literature Review. *Science and Public Policy*, vol. 36 4. pg. 255-70.
- Boga, M.**, et al. (1992): Advancing social work practice in the health field: a collaborative research partnership. *Health and Social Work* 17: 223–235.
- Bornmann, L.** (2012): Measuring the Societal Impact of Research: Research is less and less assessed on Scientific Impact Alone - We should aim to quantify the increasingly important contributions of Science to Society. *EMBO Reports*, vol. 138. pg. 673-6.

- Bozeman, B.** (2000): Technology transfer and public policy: A review of research and theory. *Research Policy*, 29 (4-5). pg. 627-655.
- Bozeman, B., Fay, D. and Slade, C. P.** (2013): Research collaboration in universities and academic entrepreneurship: The state- of-the-art', *Journal of Technology Transfer*, 38: 1–67.
- Cassidy, M.** (2014): Assessing Gaps in Indicator Availability and Coverage. SDSN Briefing Paper. [Online] <http://unsdsn.org/wp-content/uploads/2014/07/Assessing-Gaps-in-Indicator-Availability-and-Coverage.pdf> - accessed: February 08, 2017.
- CEPEI.** (2015): Colombia como País pionero en la Adopción Nacional de los Objetivos de Desarrollo Sostenibles. Decreto 280 de la Presidencia de la República. [Online] http://cepei.org/uploads/4/3/6/7/43672959/doc._decreto_280_feb.15.pdf - accessed: February 08, 2017.
- Council of Canadian Academies Expert Panel on Science Performance and Research Funding.** (2012): Informing Research Choices: Indicators and Judgment. Ottawa: Council of Canadian Academies.
- De Oliveira, T.** (2015, October 15): Impacts analysis of the FP7 projects connecting Europe and India. EU-India STI Cooperation Days 2015. [Online] https://indigoprojects.eu/page/67/attach/6_TDO_FP7_projects.pdf - accessed: February 05, 2017.
- De Oliveira, T., et al.** (2016, September): When international research collaboration contributes to the sustainable development goals, Indo-European Collaboration within the framework of FP7; in Techmonitor, Asian Pacific Centre for Technology Transfer of the United Nations Economic and Social Commission for Asia and the Pacific. [Online] http://www.techmonitor.net/tm/images/1/19/16jul_sep_sf5.pdf - accessed: February 03, 2017.
- Deutsche Forschungsgemeinschaft.** (2012, November 27): The Challenges of Impact Assessment. [Online] http://www.dfg.de/download/pdf/dfg_im_profil/zahlen_fakten/programm_evaluation/impact_assessment_wg2.pdf - accessed: February 01, 2017.
- European Commission.** (2009, September 18): Data Protection and Privacy Ethical Guidelines. Ethical Review in FP7. [Online] http://ec.europa.eu/research/participants/data/ref/fp7/89827/privacy_en.pdf - accessed: February 04, 2017.
- European Commission.** (2010): Guidance Note for Researchers and Evaluators of Social Sciences and Humanities Research. Research and Innovation. [Online] http://ec.europa.eu/research/participants/data/ref/fp7/89867/social-sciences-humanities_en.pdf - accessed: February 04, 2017.
- European Commission.** (2013): Seventh FP7 Monitoring Report: Monitoring Report 2013. Directorate-General for Research and Innovation. [Online] http://ec.europa.eu/research/evaluations/pdf/archive/fp7_monitoring_reports/7th_fp7_monitoring_report.pdf - accessed: February 02, 2017.
- European Commission.** (2015a, March 11): Seventh FP7 Monitoring Report. Monitoring Report 2013. DG Research and Innovation - Evaluation Unit (A.5) [Online] http://ec.europa.eu/research/evaluations/pdf/archive/fp7_monitoring_reports/7th_fp7_monitoring_report.pdf - accessed: February 02, 2017.
- European Commission.** (2015b, November): Commitment and coherence essential ingredients for success in science and innovation. Ex-Post-Evaluation of the 7th EU Framework Programme (2007-2013). [Online] https://www.ffg.at/sites/default/files/downloads/page/fp7_final_evaluation_expert_group_report.pdf - accessed: February 02, 2017.

- European Commission.** (2015c, November 13): The Role of Science, Technology and Innovation Policies to Foster the Implementation of the Sustainable Development Goals (SDGs). Report of the Expert Group "Follow-up to Rio+20, notably the SDGs". Directorate-General for Research and Innovation, Climate Action, Environment, Resource Efficiency and Raw Materials. [Online] <https://ec.europa.eu/programmes/horizon2020/en/news/role-science-technology-and-innovation-policies-foster-implementation-sustainable-development> - accessed: February 05, 2017.
- European Commission.** (2016): An analysis of the role and impact of Research Performing Organisations' participation in the Framework Programmes. Directorate-General for Research and Innovation. [Online] https://ec.europa.eu/research/evaluations/pdf/archive/other_reports_studies_and_documents/dgrtd-rto_final_report_3.pdf - accessed: February 05, 2017.
- European Science Foundation.** (2011, March): The European Code of Conduct for Research Integrity. [Online] http://ec.europa.eu/research/participants/data/ref/h2020/other/hi/h2020-ethics_code-of-conduct_en.pdf - accessed: February 04, 2017.
- European Science Foundation.** (2012, November 27): The Challenges of Impact Assessment. [Online] http://www.dfg.de/download/pdf/dfg_im_profil/zahlen_fakten/programm_evaluation/impact_assessment_wg2.pdf - accessed: February 01, 2017.
- European Union Committee.** (2006, May 16): Seventh Framework Programme for Research: 33rd Report of Session 2005-06. London: House of Lords [Online] https://books.google.at/books?id=jriOPeJVq_YC&pg=PA58&lpg=PA58&dq=fp7+and+impacts+at+economic+level&source=bl&ots=HiHM393SvQ&sig=x7VuToHNuXqnrK-L5LIFKjHQCM&hl=de&sa=X&ved=0ahUKEwiZtrDonb_SAhVCJcAKHY7mBHEQ6AEIVzAl#v=onepage&q=fp7%20and%20impacts%20at%20economic%20level&f=false - accessed: February 05, 2017.
- European Union Open Data Portal.** (n.d): CORDIS - EU research projects under FP7 (2007-2013). [Online] <https://data.europa.eu/euodp/en/data/dataset/cordisfp7projects> - accessed: February 04, 2017.
- Fayl, G., et al.** (1998): Evaluation of Research and Technological Development Programmes: A Tool for Policy Design. Research Evaluation, vol. 72.
- Georghiou, L.** (1994): Impact of the Framework Programme on European Industry. Office for Official Publications of the European Communities, Luxembourg.
- Georghiou, L.** (1998): Global cooperation in research, Research Policy, 27: 611–26.
- Georghiou, L. and Roessner, D.** (2000): Evaluating Technology Programs: Tools and Methods. Research Policy, vol. 29, 4–5. pg. 657-78.
- Granqvist, K. and Büsel, K.** (2015): Co-publishing patterns of EU-India – The international dimension of co-publishing in India with special regard to the European Union [Online] https://indigoprojects.eu/page/31/attach/INDIGO_Policy_Broschuere_Co-publishing_View.pdf - accessed: February 06, 2017.
- Grant, J., et al.** (2010): Capturing Research Impacts: A Review of International Practice. Rand Europe. [Online] http://www.rand.org/content/dam/rand/pubs/documented_briefings/2010/RAND_DB578.pdf - accessed: February 06, 2017.

- Guinea, J.**, et al. (2015, February 02): Impact oriented monitoring: A new methodology for monitoring and evaluation of international public health research projects. Oxford Academic, p. 131-145. [Online] <https://academic.oup.com/rev/article/24/2/131/2364625/Impact-oriented-monitoring-A-new-methodology-for> - accessed: February 02, 2017.
- Hanney, S.**, et al. (2004): Proposed Methods for Reviewing the Outcomes of Health Research: The Impact of Funding by the UK's Arthritis Research Campaign. Health Research Policy and Systems, vol. 24 [Online] <http://health-policy-systems.biomedcentral.com/articles/10.1186/1478-4505-2-4> - accessed: February 04, 2017.
- Hoekman J.**, et al. (2009): The geography of collaborative knowledge production in Europe, *Annals of Regional Science* 43. pg. 721-738.
- Horton, D.**, et al. (1993): Monitoring and evaluating agricultural research: A sourcebook. Wallingford: CABI and ISNAR.
- Horton, D.**, et al. (2007): Evaluation, Learning and Change in Research and Development Organizations: Concepts, Experiences, and Implications for the CGIAR (ILAC Working Paper 2, 2nd edn). Rome. [Online] http://ageconsearch.umn.edu/bitstream/52540/2/ILAC_Working_Paper_No2_Evaluation.pdf - accessed: February 04, 2017.
- Hübner, K. and Nill, J.** (2001): Nachhaltigkeit als Innovationsmotor - Herausforderungen für das deutsche Innovationssystem. Edition Sigma, Berlin.
- Inno Indigo Policy.** (2016, January 11): How much funding India received in FP7 and H2020? [Online] <https://indigoprojects.eu/object/news/139> - accessed: February 01, 2017.
- Katsoulacos, Y.** (1994): European Community R&D Support: Effects on the Cooperative Behaviour of Firms. Office for Official Publications of the European Communities, Luxembourg.
- Katz, J.S. and Martin, B.R.** (1997): what is research collaboration? *Research Policy*, 26, 1-18. Doi:10.1016/S0048-7333(96)00917-1.
- Kerssens-van Drongelen I. C., and Bilderbeek, J.** (1999): R&D performance measurement: more than choosing a set of metrics. *R&D Management*. 29(1): 35-46. Doi:10.1111/14679310.00115.
- Kreiner, K. and Schultz, M.** (1993): Informal collaboration in R&D: The formation of networks across organizations, *Organization Studies*, 14: 189-209.
- Krishna, V.** (n.d): Curriculum Vitae. Faculty Profile. Centre for Studies in Science Policy, Jawaharlal Nehru University. [Online] <http://www.jnu.ac.in/FacultyStaff/ShowProfile.asp?SendUserName=vvkrishna> - accessed: February 04, 2017.
- Krishna, V. and Mishra, R.** (2016): India Science and Technology cooperation with EU and other select countries. Policy Brief. [Online] https://indigoprojects.eu/object/news/183/attach/INDIGO_Policy_Brochure_ST_cooperation_View.pdf - accessed: February 04, 2017.
- Laband, D. N. and Tollison, R. D.** (2000): Intellectual collaboration, *Journal of Political Economy*, 108: 632-62.
- Laudel, G.** (2001): Collaboration, creativity and rewards: Why and how scientists collaborate, *International Journal of Technology Management*, 22: 762-81.
- Leitner, K. H. and Warden, C.** (2004): Managing and reporting knowledge-based resources and processes in Research Organisations: specifics, lessons learned and perspectives, *Management Accounting Research* 15(1), 33-51.

- Link, A. N., and Vonortas, N. S.** (2013): Handbook on the Theory and Practice of Program Evaluation. Cheltenham Edward Elgar Publishing.
- Loudin, J. and Schuch, K.** (2009): Innovation Cultures: Challenge and Learning Strategy. Filosofia. Prague.
- Luukkonen, T.** (1998): The difficulties in assessing the impact of EU framework Programmes. Elsevier, Research Policy. [Online] https://www.academia.edu/26339796/The_difficulties_in_assessing_the_impact_of_EU_framework_programmes - accessed: February 02, 2017.
- Merton, R. K.** (1968): The self-fulfilling prophecy. In: R. K. Merton (ed.) Social Theory and Social Structure. New York: The Free Press, pg. 475–90.
- Millstone, E., Van Zwanenberg, P., and Marshall, F.** (2010): Monitoring and Evaluating Agricultural Science and Technology Projects: Theories, Practices and Problems. IDS Bulletin, vol. 416. pg. 75-87.
- Morgan, M., et al.** (2013): Making the Grade: Methodologies for Assessing and Evidencing Research Impacts. 7 Essays on Impact. Describe Project Report for Jisc. University of Exeter. Exeter, UK. University of Exeter. pg. 25-43.
- Morton, S.** (2015): Progressing research impact assessment: A 'contributions' approach. Research Evaluation, 24, 405-419. Doi:10.1093/reseval/rvv016.
- OECD.** (2008): OECD Science, Technology and Industry Outlook. Paris. [Online] http://www.keepeek.com/Digital-Asset-Management/oced/science-and-technology/oced-science-technology-and-industry-outlook-2008_sti_outlook-2008-en#.WNKohHqaJ4Q - accessed: February 04, 2017.
- Parsons, T.** (1990): Prolegomena to a Theory of Social Institutions. American Sociological Review 55: 318–33. The Structure of Social Action. New York: McGraw-Hill.
- Penfield, T., et al.** (2013): Assessment, Evaluations, and Definitions of Research Impact: A Review. Research Evaluation, 2013, vol. 23 1. pg. 21-32.
- Phillips, R.** (2002): Technology Business Incubators: How Effective Is Technology Transfer Mechanisms? Technology in Society, 24 (3), 299-316. Doi:/10.1016/S0160-791X(02)00010-6.
- Piric, A. and Reeve, N.** (1998): Evaluation of Public Investment in R&D – Towards a Contingency Analysis. pg. 49–64. Paris: Organisation for Economic Co-operation and Development (OECD). [Online] <http://www.oecd.org/science/inno/1822593.pdf> - accessed: February 04, 2017.
- Protogerou, A., et al.** (2010, May 01): The impact of EU policy-driven research networks on the diffusion and deployment of innovation at the national level: the case of Greece. Oxford Academic, p. 283-296. [Online] <https://academic.oup.com/spp/article-abstract/37/4/283/1626991/The-impact-of-EU-policy-driven-research-networks?redirectedFrom=PDF> - accessed: February 04, 2017.
- Reeve, N.** (2010): Case Study of the FP7 Interim Evaluation: Notions of Quality in Evaluation Design. American Evaluation Association (AEA) Evaluation 2010. 8–13 November, San Antonio, Texas.
- Rogers, J. D.** (2002): A churn model of scientific knowledge value: Internet researchers as a knowledge value collective', Research Policy, 31: 769–94.

- Scherngell T., and Lata R.** (2013): Towards an integrated European Research Area? Findings from eigenvector spatially filtered spatial interaction models using European Framework Programme data. *Papers in Regional Science* 92(3). pg. 555–577.
- Shrum, W., et al.** (2007): *Structures of scientific collaborations*. Cambridge: The MIT Press.
- Sustainable Development Solutions Network.** (2013): *An Action Agenda for Sustainable Development*. Report for the UN Secretary-General. Paris, France and New York, USA: SDSN. [Online] <http://unsdsn.org/wp-content/uploads/2013/06/140505-An-Action-Agenda-for-Sustainable-Development.pdf> - accessed: February 08, 2017.
- Sustainable Development Solutions Network.** (2013): *Join the Sustainable Development Solutions Network. The benefits of membership*. Website. [Online] <http://unsdsn.org/wp-content/uploads/2014/03/140124-Join-the-SDSN-the-benefits-of-membership.pdf> - accessed: February 08, 2017.
- Ulnicane, I.** (2015): Why do international research collaborations last? Virtuous circle of feedback loops, continuity and renewal, *Science and Public Policy* 42, p. 433–447 Doi:10.1093/scipol/scu060.
- Van Raan, A.** (2000): R&D Evaluation at the Beginning of the New Century. *Research Evaluation*, vol. 92. pg. 81- 86.
- Vuolle, M., et al.** (2014): *Development of key performance indicators and impact assessment for SHOKs*. Finnish Ministry of Employment and the Economy. [Online] <http://tem.fi/documents/1410877/3437254/Development+of+key+performance+indicators+and+impact+assassment+for+SHOKs+25062014.pdf> - accessed: February 04, 2017.

ANNEX: QUESTIONNAIRE

1 BASIC BACKGROUND INFORMATION ABOUT THE INDIVIDUAL INTERVIEWEE:

- Q1** Do you have any previous experience with India? / And, why India, as a project partner?

2 IMPACTS IN TERMS OF ADVANCEMENT OF KNOWLEDGE:

- Q2** What were the project's major findings?
- Q3** What did you gain from the project in terms of new knowledge?
- Q4** Were the results taken up by another research team, or did the project lead to any follow-up projects?
- Q5** How relevant was the project for India and European needs?

3 IMPACT IN TERMS OF INTER-REGIONAL KNOWLEDGE AND TECHNOLOGY TRANSFER:

- Q6** How would you describe the ways of work and knowledge production in the project? To what extent were Indian partners involved in the research?
- Q7** Would you say the Indian partners benefitted from European knowledge or technologies? And vice-versa?
- Q8** Have you continued to work with the project partners? / Do you still work together? / Did the project manage to create a sustainable network of different stakeholders (universities, transfers centres, political authorities, and enterprises)?
- Q9** Did the project lead to the creation of joint research infrastructures, such as shared facilities laboratories, online platforms?

4 ECONOMIC BENEFITS:

- Q10** Did your project lead to the creation of products or new services? If yes, were they commercialised or taken to the market (public policy, private sector market, etc.)?
- Q11** Did you have the chance to establish businesses (spin-offs, start-ups) or to harness other business opportunities during the project (visits/company contacts, etc.)?
- Q12** Did the results of the project lead to the creation of new jobs?
- Q13** Did the project and the international collaboration generate any other innovative activities? If yes, what kind of innovations were they?

5 COMMUNITY BENEFITS:

- Q14** In your opinion, how relevant was the project for the enhancement of EU-India relations?
- Q15** What have you gained by working with the Indian partners (culturally speaking, etc.)?
- Q16** Did your project include or otherwise reach non-scientific communities? Which ones and how? Did the project generate benefits for these communities? For instance, improvement of quality of life; health; equal opportunities, poverty alleviation?

6 POLICY IMPACT:

- Q17** Was policy-making in Europe or India aware of your results? Did the project's findings feed into policy activities or result in policy changes?
- Q18** Did the project lead to the creation of new scientific agreements or political agreements between both regions?

7 IMPLEMENTATION / LESSONS LEARNED:

- Q19** Did you face any bureaucratic difficulties related to the implementation of the project's objectives?
- Q20** Do you have any other comments about the implementation of the project that might be useful for us to know?
- Q21** What are the lessons learned in terms of science and technology collaboration with India?

