INDO-EUROPEAN COOPERATION WITHIN THE FRAMEWORK OF FP7

WHEN INTERNATIONAL RESEARCH COLLABORATION CONTRIBUTES TO THE SUSTAINABLE DEVELOPMENT GOALS

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Abstract

This article will examine whether international collaboration in science is addressing sustainable development goals (SDGs) in the collaboration between the European Union and India[1], within the specific framework of the Seventh Framework Programme (FP7). This framework is one of the most important channels of international research collaboration between India and the EU. We address the international research collaboration from the perspective of project coordinators/participants of the EU-funded projects and we investigate the impacts of those selected projects on the UN SDGs. Our qualitative study presented here was designed to look at the international research collaboration in addressing SDGs in the collaboration between the EU and India, within the specific frameworks of FP7. We have reached the conclusion that international research collaboration plays a pivotal role in achieving the SDGs.

Introduction

The interlinkage between International research collaboration & sustainable development goals

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. Under this definition lies a concept of 'deep collaboration involving a division of labour and creative contributions from all partners, rather than weaker forms of collaboration' (Laudel, 2011). Within this article, we will be looking at international research collaboration within the programmes whose *raison d'être* is to 'foster global cooperation in research through project support' (Georghiou, 1998), especially the Seventh Framework Programme (FP7).

The concept of international research collaboration is particularly relevant when applied to our study and it can be defined and operationalised in many different formats, including: researcher exchange, formal intergovernmental agreements on scientific cooperation, meetings and workshops, international large-scale facilities, collaborative projects, publications, international large-scale facilities and the establishment of laboratories (Georghiou, 1998). As identified by Georghiou (1998), international research collaboration can be measured through co-publications and collaborative projects. Co-publications are considered to be the key indicators that help to define strategic international research collaboration, and they are used as one of many proxies for the assessment of the state of collaboration in science. In the case of Indo-European collaboration, the co-publication data is notably meaningful. As regarding, the collaborative project, a testament of India's growing strength as a research and innovation partner to the European Union has been its participation in the EU Framework Programme for Research and Technological Development.

The Seventh Framework Programme (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 to contribute to the enhancement of specific Sustainable Development Goals (SDGs)[2], such as, 'Good Health and Well-being'; 'Clean Water and Sanitation'; 'Affordable and Clean Energy' and 'Partnerships for the Goals'.

Indeed, science, technology and innovation have undoubtedly long been acknowledged as the basis for socio-economic development, and are also currently considered to be the main contributors to meet the SDGs. According to William Colglazier (2016), science, technology and innovation are critical for making progress on every one of the SDGs[3]. Colglazier notes that 'science can contribute in several ways: by identifying

[1]Indigo Policy (FP7 project) is producing a qualitative impact assessment study of FP7 projects connecting Europe and India. Some of the reflections and results presented in this article will be available in the qualitative impact assessment study. For further information: https://indigoprojects.eu/
[2]http://www.un.org/sustainabledevelopment/sustainable-development-goals/
[3]http://www.sciencediplomacy.org/editorial/2016/diplomacy-for-science-and-science-for-sustainable-development

challenges, advising on actions that can make a difference, identifying indicators for monitoring progress and searching for innovative solutions'[4].

According to the European Commission, Science, Technology and Innovation are a fundamental tool to implement the new Agenda, as it allows improving efficiency in both economic and environmental senses, developing new and more sustainable ways to satisfy human needs and empowering people to drive their own future. The STI policies are thus considered by the European Commission to be the keystones in making the EU the 'global frontrunner of sustainable development'[5].

The United Nations has called for a 'seat for science' on the High-Level Political Forum that deals with the UN's Sustainable Development agenda, to ensure that 'science is not just an observer but an advisor to policymakers'[6]. Not only have international organisations stressed the pivotal role that STI plays for sustainable development, but also the science policy community has corroborated those statements. The challenge of meeting human development needs while at the same time protecting the Earth's life support systems is one of the most important areas of discussion for scientists, policy makers and communities across the globe. Indeed, the last decade has witnessed the resurgence of many different movements to harness science and technology (S&T) in the quest for a transition towards sustainability (Clark and Dickson, 2003).

This resurgence effectively means bringing S&T to bear the highest priority goals of a sustainability transition, with those goals defined not by scientists alone but rather through a dialogue between scientists and the people engaged in the practice of 'meeting human needs while conserving the earth's life support systems and reducing hunger and poverty'[7].

Therefore, within this article, we examine whether international collaboration in science is addressing SDGs in the collaboration between the European Union and India, within the specific framework of FP7. Given the size of its overall budget and its expansive breadth, FP7 is well-suited to test our main research question: to what extent have FP7 projects between India and the EU contributed to the achievement of SDGs in India? How can international research collaboration, such as FP7, contribute to the enhancement of SDGs?

The case of EU–India collaboration surely is one of the most interesting for the field of international research collaboration. Scale and potential are two key reasons. First, Europe is undoubtedly a world leader in research and innovation, boasting 24% of the world's expenditure on research, 32% of high-impact publications and 32% of patent applications despite having only 7% of the world's population[8].

India's research and innovation system warrants respect in its own right, ranking ninth in the world according to the *SCImago Journal & Country Rank* behind only the United Kingdom, Germany, France and Italy (in terms of Europe)[9]. Still, the expectation is that now as officially the world's fastest growing economy,[10] India's contributions to the global research and innovation ecosystem will grow at a similarly fast pace. A strong case for why the EU collaboration with India is a high priority is well summarised in a 2014 European Commission document titled 'Report on the implementation of the strategy for international cooperation in research and innovation'. It states:

> *'India's developments, such as those in space technology with capabilities to launch commercial satellites and un-manned missions to the moon and to Mars, nuclear technology, pharma research capabilities in drug discovery and commercialization, ICT software, biotechnology in health and agriculture and the emerging capabilities in automotive research and telecommunications, have contributed to the country's recognition as an important knowledge power in the global economy. India is also attracting attention as a vibrant and versatile source of frugal innovation, a cost-effective and inclusive innovation, leading to affordable products and services without compromising on quality and environment protection standards.'*[11]

Our qualitative study was designed to look at the international research collaboration in addressing SDGs in the collaboration between the EU and India, within the specific framework of FP7. We selected a group of FP7 projects with Indian and European participants, and chose to interview a group of 25 individuals, namely project coordinators from the European side and Indian participants involved in these projects, in different scientific fields of relevance to EU–India cooperation – Water, Health and Energy.

The purpose of this study is to qualitatively examine and monitor the impact of cooperation between India and European Union Member States in FP7. In this article, the chosen research approach within this article is mid-range theory building up from aggregate empirical data, 'aiming at integrating theory and empirical research to explain a specific set of phenomena' (Merton, 1968).

Section 2 presents shortly the scope of the scientific collaboration between India and the EU. Section 3 presents some key results of the qualitative impact

[4]Sustainable development agenda: 2030 Building knowledge-based societies is key to transformative technologies by William Colglazier (2015).
[5]ec.europa.eu/newsroom/horizon2020/document.cfm?doc_id=12065
[6]See the UN policy brief at https://en.unesco.org/un-sab/sites/un-sab/files/Final_SAB_PB_MOI.pdf, and more information at http://www.asianscientist.com/2015/07/features/unesco-3-5-gdp-sti-spending/
[7]National Research Council (1999) *Our Common Journey* (Natl. Acad. Press, Washington, DC).
[8]http://europa.eu/rapid/press-release_IP-12-967_en.htm?locale=en
[9]http://www.scimagojr.com/countryrank.php
[10]http://www.schwab.com/public/schwab/nn/articles/India-Becomes-World-s-Fastest-Growing-Economy-What-Investors-Need-to-Know
[11]http://ec.europa.eu/research/iscp/pdf/policy/annex_roadmaps_sep-2014.pdf (p 28)

assessment study within the framework of the Indo-European collaboration.

India and the European Union: the scope of the scientific collaboration

The collaboration between India and the EU in the field of science, technology and innovation has been steadily gaining with respect to importance and size. In the case of India and the EU, formal collaboration in science and technology started with the signature of the European Community–India Science and Technology Cooperation Agreement (STCA) on 23 November 2001 establishing the EU–India Joint Steering Committee on Science and Technology.

The STCA, which was renewed in 2007, indicated that efforts should aim to create a joint infrastructure for advanced research and funding systems for the promotion of S&T collaboration. In it, leaders also welcomed efforts to strengthen partnership initiatives such as joint projects with co-investment of resources in selected fields of mutual priority.

The scope of EU–India scientific cooperation was further broadened in 2009 with the signature of the bilateral agreement between EURATOM and India in the field of fusion energy research. At the December 2010 EU–India Summit, leaders recognised the importance of a more coordinated approach in research and innovation. The Summit welcomed the new dynamic of the India–EU and Member States Research and Innovation Partnership for more coordinated cooperation in tackling major societal challenges, aligning FP7 and India's own national science and innovation programmes. These societal challenges were clearly connected with the SDGs and most specifically in the field of water issues. In addition to FP7 open calls, Europe and India also joined forces for coordinated calls in key fields for India, for instance, Food and Nutrition Research and Water Research.

Another relatively recent advancement was the 2012 Joint Declaration on Research and Innovation. This declaration called for *'Moving up a gear in our cooperation towards building an Indo-European Research and Innovation Partnership'* with (i) larger scale, scope and impact and (ii) focus on common societal challenges.

More recently, under the patronage of the 13th EU–India Summit Brussels in April 2016, both regions showcased some concrete examples of projects in water-related research and innovation. According to the European Commission, 'These projects were quite concrete and impact-oriented as they included the construction of 20 fully functional pilot installations for the treatment of wastewater in urban, peri-urban as well as rural settings in various parts of India'. It was stated as well that 'the presence of entrepreneurs, start-ups, SMEs and investors at the conference made it possible to explore options for further partnerships and investments, to translate the projects' results into full-scale commercial applications'[12]. According to the European Commission, this conference had illustrated that 'international research collaboration can contribute to have impacts on the daily lives of populations across the world, and also contributes to broader policy and diplomatic objectives'[13].

Looking at the case of India, co-publications are demonstrative indicators of the level of cooperation between certain regions of the world, notably the EU. Again, three main areas were prioritised – Water, Health and Energy – for the implementation of key actions related to the Societal Challenges, as recently presented by INDIGO Policy in 2015[14].

Within the field of Water, the subtopics of focus such as Urban Management, Water Purification and Water Treatment and Integrated Water Resource Management were all highly cited[15].

With regards to the field of Energy, the subtopics were focussed on Smart Grids, Smart Cities and Solar Energy and finally, on Health issues, the focus was on affordable health care and infectious diseases, which were all equally highly cited[16]. According to the analysis of one of the policy papers of INDIGO Policy project published in 2015, 'from 2003 to 2012, India was involved in 588 co-publications on key topics such as urban management and 430 on waste water'[17].

With regards to the field of Health in terms of volume, the collaboration in this field is increasing 'much faster than on average across the fields. In particular, diabetes research is an active area of international collaboration, with steadily increasing output'[18].

According to the above-mentioned policy paper (2015), in the period of 2003–2012, Indian involvement in international co-publications on diabetes grew significantly from 68 publications in 2003 to 408 in 2012. The same applies for the subtopic affordable health, with India showing increased growth in terms of co-publications over time with different countries across the world. Not surprisingly, the field of Energy has become an important field of international collaboration for India in the last 10 years[19].

The international co-publications clearly demonstrate that India is growing in strength as a research and innovation partner to the EU in terms of co-publications. The analysis of the three priority thematic areas – Water, Health and Energy – shows that Europe collaborates actively with India[20].

Finally, the increasing importance of India to European science networks can be measured by its participation in the

[12]http://ec.europa.eu/research/iscp/index.cfm?pg=india
[13]http://ec.europa.eu/research/iscp/index.cfm?pg=india
[14]Granqvist, Kaisa and Büsel, Katharina (2015) Policy Brief: Co-publishing patterns of EU-India—The international dimension of co-publishing in India with special regard to the European Union [Online]. Available: https://indigoprojects.eu/page/31/attach/INDIGO_Policy_Broschuere_Co-publishing_View.pdf
[15]Idem
[16]Idem
[17]Idem
[18]Idem
[19]Idem
[20]Idem

EU Framework Programmes for Research and Technological Development: from 36 participating organisations in FP4 (1998–2002) and 39 in FP5 (1998–2002) to 142 participants in FP6 (2002–2006), and more than doubling in FP7 (2007–2013) to 305 participants. Under the most recent FP7, India was the most active third country in terms of participation (305 participants in 181 projects) and fourth in terms of financial contribution (€35.8m) from the European Commission – behind only Russia, the United States and China.

A very small sampling of other projects has included topics such as: Food security and cultivation of high-yielding grasses; Metal oxides for future nanoelectronics; Drugs for Tuberculosis, Flood resilience techniques and 'Seismic wallpaper' to withstand earthquakes; Agroforestry sustainable aquaculture and on the role of multinational companies in addressing global development challenges; Biomass, a renewable energy and Poverty reduction analysis. It is also striking that how many projects involving at least one Indian partner include 'India' in the actual project title.

Using the available quantitative and qualitative data[21], this review has demonstrated India's participation in FP7, which was characterised by a vibrant diversity of key scientific areas. Through FP7, Indian researchers investigated grand challenges

S.no.	FP7 collaborative projects including 'India' in project title
1	Developing efficient and responsive community-based micro health insurance in India
2	Role of human papillomavirus infection and other co-factors in the aetiology of head and neck cancer in India and Europe
3	EU-India Fostering COOPeration in Computing Systems
4	Euro-India ICT co-operation
5	Modelling and analysing demand response systems
6	Increasing the dialogue between India and Europe by improving EU awareness and access to Indian research and innovation technology programmes
7	Innovative guidelines and tools for vulnerable road users safety in India and Brazil
8	HighNoon: adaptation to changing water resources availability in northern India with Himalayan glacier retreat and changing monsoon pattern
9	European Union and India Enhanced Cooperation Framework for improved bilateral dialogue in the fields of science and technology
10	Enhancement of natural water systems and treatment methods for safe and sustainable water supply in India
11	Strengthening EU-India collaboration in networked monitoring and control systems technologies
12	Synchronising the research policy dialogue to the Indian dimension
13	Trade, agricultural policies and structural changes in India's agrifood system; Implications for national and global markets
14	Support for the advancement of policy cooperation between India and Europe in research and innovation
15	New tools for monitoring drug resistance and treatment response in visceral leishmaniasis in the Indian subcontinent
16	Innovation driven initiative for the development and integration of Indian and European research
17	India-EU Joint House for Science & Innovation
18	Large scale innovative pro-poor programmes focussed on reducing maternal mortality in India: a proposal for impact evaluation
19	EU-India platform for the social sciences and humanities
20	Euro-Indo forum for nano-materials research coordination & cooperation of researchers in sustainable energy technologies
21	The antiretroviral roll out for HIV in India – strengthening capacity to promote adherence and patient follow-up in the context
22	Health system stewardship and regulation in Vietnam, India and China
23	The role of governance in the resolution of socioeconomic and political conflict in India and Europe
24	Strengthening networking on BiomAss biotechn and biowaste conversion – biotechnology for Europe India integration
25	India-Europe cooperation to promote Ipv6 adoption
26	Sustainable e-Infrastructures across Europe and India

Source: European Union Open Data Portal

[21] Angiolillo, Sean ; IndoGenius "Policy Paper on Horizon 2020 opportunities for India", March 2016 .

across all thematic sectors – Health was the sector most represented.

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

It seems that there is a growing interest in demonstrating the outcomes of collaborative projects for the purpose of monitoring programmes, or simply to demonstrate the value of research investments. Nevertheless, as reported by UN and European Commission, assessing the synergies between programmes/projects and the monitoring of implementation is essential for the achievement of SDGs, notably in the field of STI.

Still, assessing the impact of research projects is challenging, mainly due to the considerable difficulties encountered in obtaining data (both in terms of quantity and quality) for projects' outputs and effects, as well as problems regarding the interpretation of the data gathered.

As a method in our study, we applied semi-structured interviews to gather qualitative information from the projects' coordinators and projects' participants (based in the European Member States and in India). We collected qualitative data by setting up a conversation situation (the interview) that allowed respondents the time and scope to express their opinions and perceptions on scientific collaborations between the EU and India and, more specifically, the impact of those collaborations.

First, the content analysis of the interviews shows that, in general, there was a positive response from the interviewees. The general conclusions are that on the Indian side there was, in general, a very positive response from the project coordinators/members of the consortium being associated with the EU-related projects, as this gave them a good exposure to the EU-based science institutions and researchers; on the European side there was, in general, a positive experience for the European research teams and the possibility to interact with significant research challenges in the field of Water, Energy and Health.

Generally speaking, scientific and cultural experience seems to be one of the most significant features of the EU–India cooperation projects under the framework of FP7 projects. The results of this study suggest that international research collaboration played a crucial role to meet challenges for science and knowledge, by gathering scientific expertise, identifying, clarifying and tackling global challenges such as Water Supply and Water Management for the benefit of both regions[22].

Almost all projects involved in our sample may be characterised as applied research projects rather than basic research; Indian scientist participants stated that projects were not so much about advancing a piece of frontier knowledge, but stressed how the project enabled them to address a problem in the Indian context. From the European side, it was mentioned that the fact of partnering with India brought complementarity and a better understanding in some specific challenges. In FP7 project context, advancement of knowledge often allows the acquisition of new perspectives on joint problems and the construction of joint solutions. This is clearly one of the positive findings of this study, in most cases, a win–win relationship was established, as the consortia were designed based on the knowledge sharing; and the Indian and European research teams seemed to benefit from the consortia both scientifically and technically.

One project coordinator from the European side stated clearly that *'this EU 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 the EU project (FP7)].

Another Indian researcher pointed out the real complementarity of the consortium, as it is stated below:

> *'I have been learning a lot with this consortium and with this project, […] and we are here sharing knowledge and techniques that otherwise wouldn't be possible. Sides, 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 create new knowledge and new technologies'.* [European researcher and coordinator of the EU project (FP7)].

For instance, as the member from an FP7-funded project 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'.*

Similar responses came out from other projects related to the field of Water. A response from an Indian researcher read: *'In terms of knowledge advancement we learned in an integrated manner. Our expertise was more into engineering and technology, but with help of this project we learned a lot about natural water sciences and more specifically science of natural water purification and filtration'.* For other projects, advancement also meant the exchange of new knowledge. A scientist, from an Indian scientific institution said that the EC-funded project provided an excellent opportunity for learning and acquiring knowledge. We not only learned and acquired knowledge but we also shared.

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

[22]De Oliveira, Teresa (15 Oct 2015) Impacts analysis of the FP7 projects connecting Europe and India [Online] EU-India STI Cooperation Days 2015. Available: https://indigoprojects.eu/page/67/attach/6_TDO_FP7_projects.pdf

As one Indian researcher mentioned unequivocally: *'This project was for me as coordinator simply exceptional, as Indian researcher living abroad and having the possibility to tackle challenges not only capital 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'*.

In addition, another European researcher stressed the importance of an EC project for the advancement of knowledge and more substantial attention to pivotal challenges for India in the field of Maternal Health. 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'*.

The EU Framework Programme was undoubtedly a unique opportunity for Indian participants to leverage all of the European Research Area's research infrastructure and expertise, while it provided European counterparts access to many of the top institutions in an exciting emerging knowledge area. Furthermore, it proved to be, in the case of the Indo-European international research collaboration, an excellent way to address important challenges for India, where certain competencies of the European research teams were required. Indeed, the advancement of knowledge proved to be one of the most positive outcomes of the international research collaboration between India and the European Union.

Nevertheless, the impacts of FP7 projects between India and the EU are generally manifested only after a certain delay in time. Thus, the full implications and impacts of research activities cannot be measured and fully understood immediately after the completion of a Research and Development project since the results need time to materialise and be appreciated. Our study also points out as well that a great range of the impacts are intangible in nature (involving dimensions such as learning, socio-cultural consequences, image and reputation, knowledge domain enlargement, stakeholder value and so on) which are difficult to fully identify or even quantify, as suggested by several studies in the field of science policy.

As pointed out by other major findings from the studies of the EU research programmes (Reger and Kuhlmann, 1995; Georghiou et al., 1993; Moller and Kjeldsen, 1995) as well as from the study of the Japanese Research and Development consortia (Sakakibara, 1997), intangible learning effects are the most often mentioned impact for all parties concerned. Participants of the EU projects linking India and the EU often emphasise the effect of learning new skills and enhancing knowledge. The EC-funded projects have other intangible effects: they stimulate networks among universities, research institutions and companies across national and international boundaries and create impacts at all levels of society.

The analysis of the sample interviews of project's coordinators/participants suggests that enhanced skills in international collaboration learned from the EU projects would rather facilitate future international collaboration efforts and enhance the acquisition of new skills and knowledge, that is, the collective learning processes both beneficial for India and the EU. Another important effect concerns the promotion of collaborative networks between Europe and other regions of the world among new configurations of partners; it means that they help to create a community of professionals sharing basis of knowledge and trusting each other.

The results of our study confirm what has been said by the United Nations about the role of Science for Sustainable Development and the Post-2015 Development Agenda. The main documents of the UN in this regard urge governments and institutional organisations to steadily increase their own investment in science, learning and education. Innovation and Technology are 'needed to transform countries from reliance on the exploitation of natural resources to technological innovation as the basis for development'[23].

Another dimension worthy of highlight is the strength of STI partnerships forged in FP7 projects. The interviewed project leaders/coordinators remarked that the most positive output of the collaboration was the reinforcement of partnerships for global and societal challenges. It seems that FP7 projects were tools for the enhancement of inter-sectorial scientific dialogue between India and Europe. One of the Indian researchers who had participated in a FP7 project stressed 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… it has helped for training and capacity development'.*

Although the international research collaboration in the framework of FP7 had several positive impacts for the enhancement of SDGs, some limitations were pointed out as well. The most cited limitation was the difficulty to engage with the local stakeholders, which is perceived as crucial to maximise project impact. The second weak element mentioned was the lack of policy and economic uptake.

Concerning the first limitation identified – the difficulty to engage with local stakeholders – several project coordinators and project participants interviewed, stated that it was difficult for them to connect a network between local actors. Many of our projects selected in the field of water, energy and health were dealing with key challenges for India, notably in the field of health, and were not able to establish a secure network within the Indian side.

The EU project coordinator 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*

[23]http://www.un.org/en/development/desa/policy/untaskteam_undf/thinkpieces/28_thinkpiece_science.pdf

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 local in an open and transparent way without intermediaries. In our case, this never happen. For the future, when the project is designed must verify the need to proper engage with the local communities, entrepreneurs, universities, covering the all chain. If we want results with the EU money, we must carefully assess the needs and engage with the right stakeholders'. [European researcher and coordinator of the EU project (FP7)].

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, but the dialogue was interesting but minimal without the possibility to talk with those they can actually decide and allocate financial resources for it'. [European researcher and coordinator of the EU project (FP7)].

Indeed, this last interview pointed out the lack of policy and economic uptake. A large majority of the projects were not able to deliver concrete results to the market or even establish a network of economic stakeholders. Only a few projects led to the creation of products or new services. It seems that the projects were not naturally 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.

Conclusions

Within this article, we have analysed the international research collaboration within the programmes whose *raison d'être* is to 'foster global cooperation in research through project support', especially FP7. Indeed, FP7 has proved to be one excellent avenue for reinforcing the collaboration between India and Europe, while addressing key societal issues such as water management, water supply and maternity.

The project coordinators and the participants from India and Europe expressed positive views about collaboration in the framework of project level; these frameworks allowed them sharing and advancement of knowledge; improving and forging new skills and techniques, ultimately finding joint solutions for challenging problems.

Nevertheless, challenges and limitations were mentioned as well. Our empirical results suggest that policy and economic uptake should be more closely considered and supported by providers of the grants, either the European Commission or any other entity, this being on way to proper monitoring of implementation of STI initiatives and (re)define the contents of global partnerships contributing to the enhancement of the SDGs. It seems, out of the results of our study, that improving policy coherence and better follow-up is considered necessary for both respective retrospective performance evaluations and forward looking impact assessments.

In conclusion, FP7 deploys the instrument of collaboration in particular international collaboration, even so with unique outcomes. In our case of study, international research collaboration nurtures and plays a pivotal role for the achievement of the SDGs. STI policies can indeed play a key transformational force to change the unsustainable to sustainable path.

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Global program to enhance access to patent system for inventors

The World Intellectual Property Organization (WIPO), in cooperation with the World Economic Forum has launched a global program in which patent attorneys provide pro bono help to inventors in developing countries who want to file a patent for their invention but lack the means to do so. The Inventor Assistance Program aims to help inventors and small enterprises with limited finances to pursue the patent protection that is key to successful commercialization of a product or new solution. Qualified attorneys help by providing free legal advice to inventors who would otherwise be unable to afford the legal costs of obtaining a patent. Research shows many patent applications are rejected on procedural issues that IP lawyers can help avoid.

The Inventor Assistance Program seeks to stimulate an innovative environment where all inventors are able to commercialize their products, bringing economic benefits to them, their families and communities, while ultimately boosting the pool of fee-paying clients for lawyers who helped launch this cycle by foregoing payment.

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