



APORTA: research on bilateral cooperation in Science and Technology *(Synthesis of the interviews conducted at the embassies)*

Under the European project APORTA (Access to Science and Technology in Brazil) a series of interviews with leaders of the scientific bilateral cooperation at the embassies of several member-states of European Union in Brazil were held. The idea was to take advantage of their experience in bilateral cooperation in order to identify good practices to be disseminated and applied, including for cooperation between the EU and Brazil.

This paper summarizes the results obtained from eight interviews. By ways of introduction, we explain the methodology and the general conditions under which the research was carried out. Then, as the characteristics of the cooperation are revisited, we try to obtain an overall description and highlight the specificity of the actions in different countries. The second chapter provides a relation of the main difficulties found in the process of cooperation together with the ways to overcome them. In the last chapter, there are comments related to the answers, regarding the innovation and the asymmetry in the exchange, which were submitted to our interlocutors.

Introduction: background of the study

Under the Seventh Framework Programme for Research and Technological Development of the European Union (FP7), specifically in the program “Capacities”, part seven of International Cooperation, there is an activity called Access4EU. The main goal of this activity is to encourage the participation of European research teams in national research and innovation programs of the partner countries (Brazil, USA, Japan, China, etc.). This activity should be seen as a means of implementing the reciprocity, since the research teams from those countries have the possibility to participate and submit proposals in the Calls for Proposals launched in the European Framework Programme.

a) Purpose and context

This activity complements several instruments promoted by the European Commission to strengthen the international cooperation in Science, Technology and Innovation with other regions. In the particular case of the Latin American region and Brazil, there are two main projects: EULARINET, of political dialogue in ST&I and B.BICE, which aims to encourage the Brazilian research teams to participate in FP7.

On the Brazilian side, the activity Access4EU is accomplished through the APORTA Project coordinated by the German Aerospace Center (DLR), with the participation of the National Council of Technological and Scientific Development (CNPq - Brazil), the Foundation for Research and Technology – Hellas (FORTH - Greece) and the Institute of Research for Development (IRD - France). The APORTA project started on October 1, 2009 and within the three years of its duration, it aims to disseminate information about the opportunities offered by the major Brazilian agencies (CNPq, FINEP, FAPESP, etc.) within the European scientific community by means of “information days” in Europe and by

creating and updating a website that aggregates the calls of research and / or innovation in Brazil that are available to European researchers. At the same time, the idea is to identify eventual obstacles in the Brazilian calls that hamper the access of the European teams to the Brazilian calls making it possible to submit them to the analysis of the *Joint Committee of S&T Agreement EU-Brazil* in order to overcome such barriers and promote greater interaction.

One of the most important stages of the APORTA project is a study about the agreements on bilateral cooperation in science and technology between Brazil and the European Union Member States, focusing on the difficulties encountered in its implementation. It was decided that this work should be started by contacts with those responsible for promoting and monitoring the agreements on ST&I at embassies in Brasilia; and as a result we hope to identify the barriers encountered in this interaction and get suggestions for good practices. At the same time, this methodology gave our interlocutors general information about the European projects in progress, which is another goal of APORTA.

b) Performance and limitations

It was decided that we should work with a sample of six to ten interviews, given the little time available and the inevitable redundancies that might occur. Countries with intensive cooperation with Brazil were chosen and, even with a limited sample of eight countries, the interviews lasted one month and a half.

The methodology adopted for these interviews had to be appropriated to the task and the level of the authorities interviewed because the time spent could hardly exceed one to one hour and a half and the questionnaire developed could not be widely exploited. We found it more appropriate to gather opinions and reflections of the respondents, suggesting a few more specific points to be discussed. Obviously, the richness of the information obtained depends heavily on the experience of the interlocutor, sometimes a newcomer to the post. The results also vary greatly according to the effective post, since the diplomatic representations have not, in most cases, staff fully dedicated to scientific issues and bilateral cooperation on this matter.

However, we find that each interview resulted in interesting data and documents, which were systematically registered in an individual document submitted for evaluation by our interlocutors. This paper summarizes and synthesizes the transcripts corresponding to the eight interviews.

1. General characteristics of the ST&I cooperation in Brazil

a) Provisions of the agreements

The Brazilian system of research and innovation, which includes the state components with its main structure at the federal level, is organized according to a classical scheme in three areas: policy/management, financing and implementation¹. Thus, the funding agencies that occupy the intermediate level play a central role in the planning of S&T activities in the country, including those related to international cooperation in this sector. They are therefore key players to enable the completion of cooperation agreements conducive to joint actions of research and/or innovation. The great advantage of this type of

¹ It is worth noting that some big research companies, such as Embrapa and Fiocruz, escape the scheme.

agreement is that the projects carried out under it are formally legalized, facilitating the mobility of researchers and the implementation of S&T activities scheduled.

However, international agreements are always formally initiated by an agreement signed between the two governments: as one example, the agreement in S&T between Brazil and Sweden, based on the initial treaty of economic, industrial and technological cooperation, was mentioned.

Finally, as the exchange of students, researchers and teachers is done usually by means of inter-university cooperation, there are numerous agreements signed between universities in Europe and Brazil. But unfortunately the embassies are usually not informed and have little knowledge of these interactions, making it difficult to get a fuller picture of what is happening in the cooperation. Officials at the embassies, however, recognize that many of these bilateral agreements between universities and/or research units have great potential for cooperation despite the fact that they are less formal on account of personal rather than institutional negotiations. With this first analysis, one might conclude that for a complete bilateral cooperation in ST&I with Brazil, the involvement of these three levels of agreements is necessary. Furthermore, considering at the one hand the specialization of the three major federal agencies (CAPES for mobility, CNPq for research and FINEP for innovation) and on the other hand the existence of the Research Support Foundations (FAPs) in the States, the mechanism of agreements tends to become more complex. Thus, the intensive, diversified and well established bilateral S&T cooperation with certain countries like Germany or France can count on more than fifteen existing agreements.

However, the organization of research and innovation in the European partner country should be taken into consideration, since the European partners have a strong influence on such cooperation. Ideally, when there are homologous structures in the European countries and Brazil, such as the agencies mentioned above, the agreements to be signed are clearer. It is, for instance, the case of Finland, which has an agreement between the Academy of Finland (AKA) and CNPq; of Sweden, with the exchange agreement in progress between Capes and the Swedish Foundation for Research and Higher Education (Stint); or in more complex situations like in Belgium, with the new framework agreement with CNPq and associated participation of two community funds: Flamenco (FWO) and French (FNRS).

In cases where national organizations exist on different levels than in Brazil, the mechanism of cooperation agreements becomes even more complex, less understandable and certainly much more difficult to run. Germany and France are notable examples of a more complex mechanism, even with a tendency for normalization in France, with the creation of the National Agency of Research (ANR) in 2005.

b) Types of instruments

Basically, one can distinguish two main categories of instruments in bilateral cooperation in ST&I², one more oriented to facilitate mobility of scientists, teachers and students, the other intended to facilitate the realization of joint research and technological development actions. However, this difference reflects a diversity of approaches, best suited to academia in the first case and to the public research units in the second case, because the mobility of professors and doctoral students falls naturally into a pre-set theme, just as the research project always leads to the exchange of researchers and interns. It

² Regardless of their aims, which could not be only scientific excellence.

should be noted, however, that these arrangements may be present both in agreements between agencies or between universities.

Three groups of instruments can be distinguished: Group 1, aiming at building bilateral partnerships; Group 2, aiming at using instruments seeking the generation and consolidation of networking; and Group 3, focused on the implementation of joint physical structures, such as the International Mixed Units (UMI), considered to be a more integrated international cooperation.

This typology has the advantage of including both the modalities of cooperation promoted by the agencies and based on open competition – through the publication of calls – and those used by large research institutions (CNRS-France and EMBRAPA-Brazil, for example), that pre-define and choose the laboratories of the partner countries with whom they want to build a common project: something similar to the induced call, used by some Brazilian institutions. Obviously, there is a hierarchy among the three groups namely in relation to a) the cycle of the project (the actions of type 3 are more long term), b) the duration of the stay of researchers, and c) the amount of resources involved (ranging from thousands of dollars to the mere financing of a bilateral research project, to millions of dollars for a Franco-Brazilian laboratory of biodiversity, for example), etc.

c) Scientific strategy of the cooperation

The scientific policy in other countries isn't always as clear as in the case of Britain. However, one can derive some elements and trends from the statements of the experts interviewed. Indeed, for smaller countries, whose cooperation with Brazil is modest compared with that of large European countries, the cooperation is often very well focused, with few but clear priorities. For example, Belgium has selected some areas of mutual interest that seem most promising, such as Biotechnology, Nuclear Energy, Space, Micro-electronics and Nanotechnology, in a joint call with CNPq.

Even in medium size countries, with Anglo-Saxon features, this focus occurs naturally in areas most beneficial to technological development and with potential of immediate economic appreciation. Sweden, for example, signed a special agreement in the field of Bioenergy in 2007; and more recently a Memorandum of Understanding (MoU) entered into force with the objective of promoting cooperation in the areas of high technology and industrial innovation. There is also a final agreement that completes the mechanism, conducive to a more concrete involvement of Swedish companies in this cooperation, promoting technological development.

It is much harder to understand the scientific strategies related to the cooperation with Brazil coming from the largest European countries represented in the sample, such as Germany, Spain and France, as there is a variety of actions, with different purposes for each country. Through bilateral cooperation with Brazil, these countries probably seek to establish a network of relationships both at the individual and at the institutional levels, not necessarily with immediate impact in economic terms, but more susceptible to long term revenues in cultural, economic and geopolitical areas.

The focus of Germany in its bilateral cooperation is to develop technology in specific areas such as Environment, Water Resources and Climate. Additionally, there is interest in relying on past experiences and considering the advances of Brazil in some fields, such as Biofuels, Oil Exploration (offshore), Aircraft Industry, etc., in which trade is more profitable and cooperation more effective.

Under the British cooperation with Brazil, there are interventions by the British Council and by the Department for International Development - DFID in addition to the

strictly scientific areas. The British Council takes care of the student mobility between the UK and Brazil, while the work of DFID in the Brazilian case is that of defining and assembling the joint cooperation with the developing countries. Thus, ST&I cooperation of the UK seeks to select actions that increase the flow of international co-publications and especially that increases their impact. Based on the progress of Brazilian science, documented through bibliometric analysis of scientific publications (from the data in the Web of Science[®]), the main goal is to identify the best researchers and the sectors of excellence in Brazilian science and put them in contact with British scientists from Cambridge, Oxford and other universities, supporting research projects from these partnerships. Thus, in accordance with a recent agreement entered into force with FAPESP to support joint scientific projects, the Joint Peer Review was established, by means of an evaluation committee of the Research Councils – UK (RCUK) that includes some Brazilian scientists. Anyway, the search for new forms of interaction, better suited to the intended objectives, reduces the use of traditional bilateral agreements between agencies and decreases the need for specific budget for cooperation.

2. Main difficulties in cooperating in ST&I with Brazil

Our respondents identified a few potential obstacles to be overcome in order to accelerate cooperation with Brazil on science and technology. These are primarily problems related to language, to obtaining long-term visas, issues of equivalence of diplomas and retirement pensions for researchers who had their careers both in Brazil and a European country.

a) Language

Not surprisingly, the language issue remains a major obstacle, as in many European countries the practice of Portuguese is very uncommon³. However, it is not a problem as it was fifteen years ago, because many European countries are adjusting their higher education system to international standard so that many courses in many universities are taught in English. This may contribute to attract more Brazilian students to European countries than European students to Brazil, as communication problems, especially with the local community in their daily lives and in their social relationships outside the university, can inhibit exchanges.

However, learning Portuguese (or the respective European language) needs a previous investment that is not always possible to be incorporated in the actions implemented by bilateral agreements. More efforts in this direction are needed, thus.

As far as language is concerned, the specific case of Spain is interesting because this country invests heavily in cooperation with Brazil to support the teaching of Spanish in the Brazilian educational system. Moreover, there is great interest in Brazil to encourage Spanish as foreign language. The instruments used are varied and numerous : six centers for the teaching of Spanish, support for Spanish teachers, implementation of nine Cervantes Institutes in the country, among other measures.

b) Visa for a stay of more than three months

Despite of the European Union policy which entered into force in October 2005, aiming to facilitate the entrance of scientists in the European Union and already implemented in many Member States, obtaining an EU-visa can still be a problem for

³ While, on the contrary, Spanish is more and more popular within secondary education.

Brazilian researchers and/or students with postgraduate scholarships depending on country and length of stay. In many cases, students or researchers are unable to obtain the letter of acceptance from the university on time.

We must highlight the unique case of Britain, because it is not part of the Schengen Agreement and does not offer scientific visa. British law provides a six months visa without formalities, so the foreign scientists must adapt the length of their research project to this restriction.

One must register furthermore a certain difficulty in obtaining temporary visas for Europeans who are to do research in Brazil, when it comes to cooperation between universities or outside the existing bilateral agreements.

c) Equivalence of diplomas

Regarding the question of equivalence of diplomas, it is worth noticing that any systematic solution is likely to run into political problems. Given the increasing autonomy of universities in all countries, the most convenient solution would be to adopt an *ad hoc* committee of equivalence in the universities, which would act on the analysis of each of these demands.

d) Other problems

With regard to pensions, those who work in different countries with different pension systems may face problems. Specific agreements between partner countries should be signed, aimed at solving these cases.

Another difficulty mentioned was the heterogeneity of cooperation or poor distribution of resources, sometimes concentrated in some areas like Environment and Climate Change, despite the need for its expansion to other scientific fields of bilateral cooperation.

3. Two recurrent issues

We systematically submitted two questions to our interlocutors during the interviews. The first referred to any existing collaboration in terms of innovation, if there are concrete projects in this area and if there is a particular strategy for this specific cooperation. The second question concerned the existing imbalance in the exchange, considering for example that there are much more Brazilian students in European universities than vice-versa.

a) The innovation issue

Not surprisingly, the most important performances in this field come from the three major partners of Brazil: Germany, France and Britain.

Germany is known for being a country that traditionally favors the linkage between research and industry. Thus, there are various initiatives of German-Brazilian cooperation in this area. Projects mentioned as examples include LEATHER and SHIFT as interesting consortia involving CNPq, SENAI and the Euvaldo Lodi Institute on the Brazilian side, with Master and PhD fellowships. In 2009, a new agreement between the Fraunhofer Institute and the Technological Research Institute (IPT), São Paulo, was signed. German institutions may now have a representation in Brazil and jointly promote the application of knowledge to developing technology from the research-industry integration.

For years, the France-Brazil cooperation has been struggling to provide tools to support joint projects for innovation. One can list the Delta program in the early 2000's; the agreement between ANR and FINEP of 2008, in the areas of Bioenergy, Information

Technology and Communication; or the current call for projects of OSEO and FINEP. There are also some experiences of decentralized cooperation. However, no success can be highlighted so far: the bilateral cooperation aimed at innovation is much more difficult than in scientific and academic areas. One of the major obstacles is the difficulty of finding compatible structures. Possible alternatives are the reactivation of a working group dedicated to French-Brazilian innovation (to resume the discussions at the political level, as a way to broaden the dialogue and achieve greater support) or the prospect of drafting a new general agreement between ANR-France and CNPq-Brazil, which would allow these two partners to associate for any kind of call, including calls for innovation.

Regarding the United Kingdom, collaboration in innovation avoids using a top-down approach in the case of innovation in favor of a demand-driven approach.

- 1) utilization of Brazilian technology by British actors (specialized staff in universities);
- 2) give equal importance to British technology in Brazil and Latin America via the intervention of Brazilian actors;
- 3) establishment of joint ventures between companies from both countries and cooperation in innovation processes (exchange of best practices).

For example, in order to initiate actions of the first type, Brazilian experts of the University of São Paulo (USP) and the State University of Campinas (Unicamp) were sent to Britain, with some patented technologies to be used, and this operation was successful.

b) The question of asymmetry in the exchange

Discussing about the symmetry of the agreements and reciprocity of actions, it was observed that in European countries where cooperation with Brazil is more traditional, the number of Brazilian students who study in Europe is still far greater than the number corresponding European students who enroll in Brazilian universities. The extreme case is Britain, with a big number of Brazilian students in British universities. Britain has no difficulty in attracting foreign students from any place, even considering the high cost of matching studies. This complicates possible agreements with CAPES, because the onus of a Brazilian student in the UK is much higher than in France, for example. In other countries, as Finland for instance, the imbalance doesn't carry as much weight, because the number of Brazilian students is small. This imbalance is much lower in relation to the exchange of researchers than of students, especially doctoral candidates, partly because of the availability of scholarships. The promotion of exchange of teachers could be a way to reduce this imbalance.

Undoubtedly, there is a certain ignorance in Europe in relation to the structure, position and image of the Brazilian S&T landscape. To help solve this problem, initiatives to disseminate a more updated picture of the Brazilian university system in Europe must be multiplied⁴.

Conclusions and perspectives

Brazil is increasingly present in the European countries, and for most of them it has become the priority country in Latin America. For example, although Spain has historically promoted multilateral cooperation with Latin American countries, also with the participation of Portugal (see the programs CYTED and IBEROEKA, for example, with

⁴ As it is the case of "information days" in Europe, foreseen under the APORTA project

very impressive results), their bilateral cooperation in S&T is being restructured, so as to enhance the potential for cooperation with Brazil. In the same way, the Portuguese cooperation with Brazil in education and S&T continues to be strategic and priority.

This small study shows how various European countries make a lot of effort and allocate resources to establish scientific and technological relations with the Brazilian scientific community, and implement cooperation in ST&I based on common projects, adapting to the cultural context and scientific interest of Brazil. Although the European Union provides a formal framework for collaboration and allocates its own resources for multilateral cooperation, more flow of information between Member States would be desirable in order to mutually benefit from the accumulated experiences.

It is known, for example, that various Scandinavian countries maintain privileged relations between them that perhaps could be explored for the implementation of joint local S&T cooperation with Brazil, since some subjects such as Climate Change are of particular interest to all different countries of Northern Europe. Other collaborations, like Spain and Portugal or France and Germany would surely find interesting applications in the ST&I cooperation with Brazil. Moreover, European countries that have more tradition of cooperation with Brazil could indeed support the entry of other countries in this new cooperation, for example, the countries of Eastern Europe.

Additional observation

This draft document was prepared as a background document for the debate with additional stakeholders responsible for bilateral S&T cooperation with Brazil in other European countries. This document is part of the *deliverable* D1.1 of the APORTA Project: *Analytical report on the survey of bilateral cooperation agreements and existing bilateral/reciprocal cooperation, including an overview of the Brazilian S&T funding system.*

List of interviews implemented

N°	Country	Date	Local	Interlocutors
1	France	26/01/2010	Embassy	Pierre Colombier, Cooperation Counsellor & Eric Bourland, Scientific Attaché
2	Belgium	29/01/2010	Embassy	Claude Misson, Ambassador, Else Keyers, Counsellor, Naysa Brasil Teodoro, S&T
3	Spain	03/02/2010	Embassy	Ángel Altisent Peñas, Education Counsellor
4	Germany	09/02/2010	CNPq	Dirk Schüller, Counsellor for scientific matters
5	Finland	18/02/2010	Embassy	Pekka Hirvonen, Second Secretary
6	Portugal	23/02/2010	Embassy	Adriano Jordão, Cultural Counsellor
7	Sweden	02/03/2010	Embassy	Elin Krongvist, First Secretary
8	United Kingdom	03/03/2010	Consulate General SP	Damian Popolo, Vice Consul Science and Innovation