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## The trajectory of international collaboration between FAPESP and Belmont Forum: a study based on themes of the sustainable development goals

#### **ABSTRACT**

This paper aims to explore the trajectory of the international scientific collaboration between the São Paulo Research Foundation (FAPESP/Brazil) with the Belmont Forum, in view of the theme related to the sustainable development goals. Methodologically, the study is based on bibliographic reviews, as well as through consultations with their databases and institutional websites of our case study. The results show that Fapesp's internationalization process is underway with several actors in the scientific community; such process has as one of its main characters the Belmont Forum; most of the agencies involved in the 13 calls made jointly are from countries in the Global North; the themes addressed in the calls, as well as the large areas of knowledge contemplated, incorporate interdisciplinary science and the challenges related to sustainable development as a

**KEYWORDS:** International Collaboration. Science and Technology Policy. Belmont Forum. FAPESP. Sustainable Development Goals.

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#### **INTRODUCTION**

The aim of this paper is to explore the trajectory of the international scientific collaboration between the São Paulo Research Foundation (FAPESP) and the Belmont Forum, which refers to a partnership between international funding agencies, as well as scientific councils, with a view to advancing transdisciplinary science on global environmental changes (BELMONT FORUM, 2020). In other words, it seeks to understand, through an exploratory case study, the relationship established between both institutions that promote scientific research, in view of the construction of the research agenda represented through the public calls made between them. The specific aim of this paper is to answer the following questions: i. what is the impact of the Belmont Forum and Fapesp in promoting scientific research?; ii. what are the main actors present in this international research financing partnership?; iii. what subjects/agendas are prioritized in public research funding calls?; iv. which Sustainable Development Goals (SDGs) are included in the research projects financed between them?; v. what is the impact of this cooperation on research projects linked to state universities in São Paulo (such as Unicamp, USP and Unesp)?.

Methodologically, the paper was carried out based on bibliographic reviews about the relationship between both institutions, as well as through consultations with their databases and institutional websites. In this sense, it was possible to analyze the reports published by Fapesp and the Belmont Forum, our case study, regarding the cooperation agreement established, scientific papers and academic productions, as well as access to the database of the Fapesp Virtual Library that presents the different funding modalities and funded calls. through this cooperation, as well as the SDGs linked to each project. The organization of the paper is divided into three main sections, in addition to this introduction and final considerations. The first refers to the context related to the trajectory of international cooperation in Brazilian Science and Technology Policy, with special emphasis on Fapesp's international performance. The second section aims to expose the relationship established between both institutions, in view of the context of emergence and impact of the Belmont Forum, as well as its particularities in relation to the actors that compose it and the procedures for establishing financing calls. Finally, the last section presents the results obtained regarding the cooperation signed between both actors, characterizing the relationship established between them.

#### **FAPESP AND INTERNATIONAL RESEARCH COLLABORATION**

The definition of the term "international collaboration1" cannot be treated as a trivial task. In this sense, Baiardi and Ribeiro (2011, p. 593) emphasize that "thinking about cooperation in science and technology, Science and Technology Policy, requires thinking before about cooperation more broadly, both between individuals and between societies and between territories of corporate identity, or States -nation". As Melin and Persson (1996, p. 363) point out, collaboration can be understood as a form of intense interaction that enables communication and sharing of information, resources, and skills more effectively. It is, from the authors' perspective, a "prerequisite for modern science", which is organized



both by scientists themselves and stimulated by scientific policy. Therefore, scientific collaboration can be conceived as "one of a set of science policy tools that is needed in a situation when scientific growth can no longer be based on an ever-increasing expansion of its manpower" (MELIN and PERSSON, 1996, p. 364). Within the scope of this paper, we consider scientific collaboration as the exchange of new knowledge, with the objective of training human resources and scientific and technological development, which can be carried out through partnerships between the scientific communities of different countries. One must also consider the power relations that may exist within the scope of such collaboration agreements, in view of the different actors that comprise them.

The importance attributed to the establishment of such collaborations can be seen in the scope of the European Commission itself (2009, para. 1), which highlights the following:

International cooperation in research and innovation is a strategic priority for the EU. It enables i. access to the latest knowledge and the best talent worldwide; ii. business opportunities in new and emerging markets; iii. science diplomacy to influence and enhance external policy. Multilateral research and innovation initiatives are the most effective way to tackle challenges facing our world - climate, health, food, energy and water - that are global by nature. Working together reduces the global burden, pools resources and achieves greater impact.

In this case, it is a worldwide trend that has been growing over the years and that can be established in the context of the organization of scientific meetings and conferences, in the construction of international databases, in technical and specialized assistance, in the maintenance of laboratories, and in calls to promote research, among others (WAGNER, 2005). In the context of Brazilian development agencies, there are two international cooperation mechanisms, that is, the production of scientific knowledge and the training of human resources (Morosini, 2006). This trend can also be seen in the case of Fapesp, which will be better explored during this section.

The establishment of such collaborations can be formally initiated, being instituted through the signing of a term of agreement between the partner actors. This type of collaboration is characterized by formal structuring whose commitment can be realized in the long term, as well as with concrete objectives, goals, and activities. There are also collaborations carried out informally, that do not require the establishment of formal agreements. Over time, these collaborations can be formalized, involving different actors, institutions, and countries (DOMINGUES, 2014). Within the scope of this paper, we will specifically address formal collaborations. Thus, it can be said that a collaboration that involves different bodies from two or more States also represents an instrument of Foreign Policy, since it encompasses international relations whose objective goes beyond the scope of Science and Technology Policy, and may imply different relations with other fields, such as it is the case of economic development, the construction and maintenance of diplomatic relations and facing global challenges, as is the case of the Sustainable Development Goals (SDGs), among others (AMORIM, 1994; DOMINGUES, 2014).



[...] when it comes to formal collaborations, which require institutional agreements, international collaborations can be presented at several other levels, involving different actors. They can occur between research groups, departments of the same institution, between different institutions and sectors - universities, companies, R&D centers, public and private laboratories - between geographic regions and countries (Katz; Martin, 1997). In addition to these levels, at the international level, scientific actors count on the performance of supranational institutions that coordinate projects in cooperation with specific objectives, involving different countries (DOMINGUES, 2014, p. 183, our translation).

Despite the positive results that can be generated, Ashman (2001) highlights that international scientific collaborations must be carried out in an equitable manner and with mutual benefit, since the division of power between the actors participating in the collaboration can become a complex issue to be addressed. According to the author, a survey carried out in 1998 with NGOs from Africa, Asia, and Latin America, reported that a large part of their leaders said they had little or little influence on the relations maintained with funding agencies in the Global North. In the African case, for example, participating NGOs reported that existing cooperation threatened their administrative autonomy and the scope of their missions. In this sense, historically, it is possible to observe a movement on the part of organizations from the Global South to reject the legitimacy imposed by Northern institutions in projects that assigned only implementation functions to them, since they demanded to address their own national development agendas and resources for the establishment of collaborations (Ashman, 2001). Situations such as these can also occur within the scope of scientific collaborations, with the possibility of importing/mimicking agendas for the national context, that is, the "S&T policies [national] are influenced by international concerns", as occurred in the 1990s in the scope of the Brazilian State (DIAS, 2012, p. 142, our translation; DAGNINO, 2015).

Therefore, specifically about the Brazilian Science and Technology Policy, the main financier of international scientific collaboration is the Federal Government, being carried out through the Coordination for the Improvement of Higher Education Personnel (CAPES), the National Council for Scientific and Technological Development (CNPq), the Financier of Studies and Projects (FINEP), the Brazilian Cooperation Agency (ABC), and state funding agencies, with special emphasis on Research Foundations (FAPs) and, more specifically, the São Paulo Research Foundation (FAPESP). In this sense, it is possible to identify the main actors present in the establishment of international collaborations of Brazilian Science and Technology Policy: "national governments, multilateral research organizations, public research organizations, universities and research centers", in addition to "the Ministries directly responsible by S&T policies", nongovernmental organizations and private companies (DOMINGUES, 2014, p. 184, our translation). Each actor, in turn, has different objectives, goals, action plans and strategies, which directly affect the realization of international collaborations.

In the case of the definition of the research agenda and the national Scientific and Technological Policy (PCT), Bezerra da Silva (2013, p. 55, our translation) explains that this occurs through opinions and the participation of



"most prestigious professors-researchers in each area of knowledge". Such teacher-researchers are constituted, in this sense, as the main responsible for the formulation, implementation and evaluation of the Brazilian Science and Technology policies, which "compose and articulate social networks around decision agendas", being characterized "by the interaction of the actors to make possible the elaboration of policies that meet their [own] agendas" (BEZERRA DA SILVA, 2013, 23-28, our translation). In the context of collaborations, other issues are incorporated into the definition of the agenda, such as the search for foreign and international investments, economic and political interests, assistance to developing countries, and the improvement of research capacity (DOMINGUES, 2015). Paquette (2002) also shows that such collaborations can be influenced by the shared values on the part of the actors involved in the formulation and implementation of the strategies defined for the collaboration. Therefore, such strategies end up being outlined mainly by the actors who participate in these international collaborations, being deeply related to the values of the individuals or institutions that plan it.

From that perspective, international collaboration in research can generate positive results for the different actors involved and, for instance, there is a growing tendency for Brazilian participation in such collaborations, which has reached a greater momentum since the 1990s (LETA and CRUZ, 2003). According to Leta and Cruz (2003), it is possible to see an absolute growth in terms of Brazilian scientific production in the period between 1983 and 2003. To corroborate and update this perspective, Salomon (2018) indicates an increase in scientific production in the range of 133% over the past 10 years. It is also possible to observe that "in 20 years, the production in international collaboration went from 20% to 30% of the total papers published by at least one Brazilian (LETA and CRUZ, 2003), conferring greater international recognition for Brazilian science" (DOMINGUES, 2015, p. 62).

On the other hand, it is necessary to highlight the power asymmetries related to such collaborations. Considering the Latin American perspective of Social Studies of Science and Technology, as well as studies on the geopolitics of knowledge, we can identify a number of scientific productions that deal with how such collaborations are established, as well as the objectives inherent to their establishment (VESSURI, 1996; KREIMER and LEVIN, 2013; FERPOZZI et al., 2019; DEMETER, 2019; CONNEL and MAIA, 2012). If, on the one hand, Latinos consider the cooperation good in itself, visualizing the benefits of interaction and greater visibility for local science; Europeans, on the other hand, use these cooperations as a strategy to strengthen European science and among their competitors (KREIMER and LEVIN, 2013).

Considering this context and what was previously presented, Fapesp, our case study, has shown a significant growth trend in international collaborations over the years. It should be noted that this Foundation was formally created in 1960 by Organic Law No. 5,918, of October 18, 1960, starting to operate only in 1962, through Decree No. 40,132, of May 23, 1962. Therefore, it is one of the main agencies for promoting scientific research in the country, being internationally recognized for its quality and for supporting a large part of the national and, above all, state scientific community.



Within the scope of the law that institutes it, the purpose of the Foundation refers precisely to the "support for scientific research" in its State of origin, with the task of:

I - pay, totally or partially, for research projects, individual or institutional, official or private, deemed advisable by its competent bodies; II - partially pay for the installation of new research units, official or private [...]; VI - to periodically promote studies on the general state of research in São Paulo and in Brazil, identifying the fields that should receive priority for promotion; VII - to promote the exchange of national and foreign researchers, through the granting or complementation of scholarships or research, in the country or abroad; VIII - promote or subsidize the publication of research results (ALESP, 1960, para. 3, our translation).

These skills demonstrate the strategic role and importance of such a Brazilian development agency within the scope of the national Science and Technology Policy, as well as in relation to its potential in establishing new collaborations and cooperation between national and foreign researchers and researchers. Therefore, according to Lafer (2015), the Foundation's promotion aims to achieve three main objectives: i. the advancement of scientific knowledge; ii. applied research; and iii. support for research infrastructures. The first objective concerns the provision of educational and research scholarships, with a view to training human resources, in addition to thematic projects and various programs. The second refers to the financing of research with great potential for application, as well as of economic and social interest, being developed through projects such as Innovative Research in Small Companies (PIPE). In the case of the third objective, the disbursement of resources is foreseen to provide adequate infrastructure for carrying out research, such as the modernization of laboratories and internet access.

In this context, this Foundation has two main financing modalities, namely regular grants, and international agreements. The first of them, initiated in the 1960s, refers to the support granted to students and researchers on a constant basis by the Foundation. The second, that is, international agreements, concern scientific collaborations signed with international institutions, formally initiated in the 1980s (DOMINGUES and DA COSTA, 2016). The focus of this paper, therefore, concerns such agreements.

It should be noted, in this sense, that, as Lafer (2015) attests, Fapesp has been going through a process of constant internationalization in recent years. This process is carried out through agreements with similar entities (such as Higher Education Institutions - HEIs, laboratories, research centers and other development agencies) around the world, constituting itself as "a response to the challenge of the importance for the advancement of knowledge, the potential for interaction between national and foreign researchers", as well as their insertion into the "new molds on the agenda of the world agenda" of research (LAFER, 2015, p. 8-9, our translation). Thus, to identify Fapesp's interaction with other actors in the international scientific community, the Foundation itself presents a map of such collaborations on its institutional website. Prior to its presentation, the categorization of the types of agreements signed stands out:



a) Agreements offering initial funding ("seed fund"), mainly for exchanging researchers and students and for small seminars. In this case, the foreign partner is usually a university or a research institution. b) Agreements that offer full funding for research projects selected jointly by FAPESP and the partner agency or company. In this case, the foreign partner is usually a development agency or an industrial research laboratory (FAPESP, 2020b, para. 3, our translation).

For the agreements maintained by the Foundation, those concerning cooperation with research agencies and funding agencies, which are mostly located in the Global North, are noteworthy. Among the main ones, the following are highlighted: National Science Foundation (NSF); UK Research and Innovation (UKRI); Belmont Forum (BF); Biotechnology and Biological Sciences Research Council (BBSRC); German Research Foundation (DFG); among others. In short, within the scope of the results to be presented throughout this paper, a significant increase in this interaction with international institutions can be seen, and the Belmont Forum can be noted as one of the main collaborations signed over the years with Fapesp, being considered an important agreement signed by its leaders regarding the incorporation of the agenda related to the Sustainable Development Goals (SDGs) (FAPESP, 2020c).

#### FUNDING FOR SCIENTIFIC RESEARCH THROUGH THE BELMONT FORUM

According to its institutional website, the Belmont Forum (BF) was established in 2009 and constitutes itself as a partnership between "funding organizations, international science councils, and regional consortia committed to the advancement of transdisciplinary Science" (BELMONT FORUM, 2020, para. 1), being coordinated by the International Group of Funding Agencies for Global Change Research (IGFA)<sup>2</sup>. This partnership involves approximately 29 institutions that promote science, representing 50 countries and 6 scientific coordination bodies committed to the dissemination of scientific knowledge related to global environmental changes. The BF has conducted a total of 17 calls for proposals since the beginning of its operation, supporting 134 projects and contemplating more than a thousand scientists from more than 90 countries, whose themes are related to biodiversity, land use, coastal vulnerability, food security, and the Sustainable Development Goals, among others (BELMONT FORUM, 2019; 2020).

In the words of von Schneidemesser (2012, para. 1),

It aims to do so by mobilizing international resources at a scale that matches this challenge 'in order to catalyze delivery of the environmental science-derived solutions that society needs.' To achieve this goal, the member countries of the Belmont Forum have formed a new working partnership that launched the International Opportunities Fund (IOF) - an open call for proposals with focus themes and the intention of new themes for a new funding round each year [...]. This mechanism enables international collaboration to tackle global problems, while removing barriers such as the uncertainty of multiple proposal review processes for funding when partners from multiple countries wish to collaborate.



Among the participating scientific institutions, which means, members "legally allowed to mobilize resources from national or international research funds and are engaged in activities that address the Belmont Challenge" (Belmont Forum, 2020, para. 39), the following stand out: National Science Foundation (USA); European Union Commission (European Union); Federal Ministry of Education and Research (Germany); French Research Alliance for the Environment/French National Agency for Research/Ministry of Higher Education, Research and Innovation (France); Natural Environment Research Council (UK); National Natural Science Foundation of China (China); Ministry of Education, Culture, Sports, Science and Technology/Japan Science and Technology Agency (Japan); Natural Sciences and Engineering Research Council of Canada (Canada); Inter-American Institute for Global Change Research (Americas); São Paulo Research Foundation (Brazil) and Ministry of Science, Technology and Innovation (Argentina), in addition to other institutions in South Africa, Australia, Austria, Qatar, Côte d'Ivoire, Netherlands, India, Italy, Mexico, Norway, Sweden, Thailand, Taiwan and Turkey.

In this sense, to become a member of such a Forum, there are three requirements to be fulfilled: i. the participation of the organization of a Collaborative Research Action (CRA); ii. contribute monetarily to the BF Secretariat; and iii. identify a principal representative of the organization to be responsible for the business of the BF. Indeed, those who are interested should send a letter of interest to the Secretariat indicating the areas of mutual benefit, ensuring compliance with such requirements, and communicating the provision in the establishment of the partnership. After the approval of the Forum members through an annual plenary, the organization's membership is confirmed, which now has the right to vote, as well as the possibility of proposing topics for the CRAs and participation in the BF Steering Committee (BELMONT FORUM, 2020).

CRAs are equivalent, in the scope of the BF, to a call for proposals, and each proposal submitted must be constituted as a project jointly developed by natural, social scientists (including economics and humanities) and other interested actors from at least three countries. The research, however, can be carried out in only one or more countries, but it must have at least three participating funding organizations. The submitted research projects are evaluated according to merit criteria and the investment made in a CRA, is not limited only to members of the BF, since there is the possibility of being financed by interested support organizations, which can be associated with the BF at any time of the financing made. It should be noted that "not all Belmont Forum members participate in every CRA" (BELMONT FORUM, 2020, para. 8).

For its organizational structure, the flowchart below is shown:



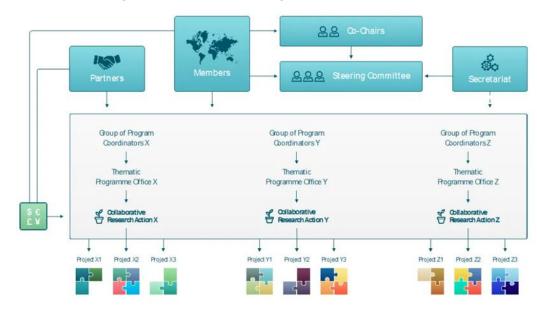


Figure 1 - Belmont Forum organizational structure

Source: Belmont Forum institutional website.

To explore such organizational structure, in addition to the terms already discussed, the Belmont Forum states the following:

Partners are organizations that subscribe to the Belmont Forum, but do not fund research and/or do not meet the criteria for membership; The Steering Committee is elected by Belmont Forum members to support and advise Belmont Forum activities between plenary meetings. The committee consists of eight members headed by two Co-Chairs; The Belmont Forum Secretariat serves as the administrative arm of the forum and is tasked with carrying out decisions made during the plenary meetings; Projects are funded under Collaborative Research Actions (CRAs). CRAs fund multiple projects. CRAs are the primary mechanism by which the Belmont Forum institutes joint international calls for proposals in partnership with interested organizations [...] (BELMONT FORUM, 2017, para. 1).

From the perspective of Kileen et al. (2012), BF refers to one of the world's largest research financiers on the topic of sustainable development and global environmental changes, stimulating the development of research between developed and developing nations, as well as making efforts for interdisciplinary collaborations to be produced within the scope of the research contemplated by the financing offered. Likewise, MURPHY and LUCAS (2017) add that in order to achieve the so-called "Belmont Challenge", that is, a series of international environmental and social challenges signed by the group, specific conditions must be created within the scope of partner institutions, as is the case with the provision of a digital infrastructure for carrying out the research, the coherence between the principles and the data policy of the BF, and the guarantee that the contemplated researchers have the necessary resources and data for the research.

In other words, it is a partnership signed between different research support institutions (such as development agencies and interested ministries), which aim to finance research projects around the world on the current model of global



development, its environmental implications, social and economic, through dialog between a range of actors and areas of knowledge. This partnership has significant impacts in terms of promoting global scientific research, since: i. "The Belmont Forum is comprosed of 29 funding agencies on six continents"; ii. "Collaborative Research Actions have funded 99 different projects"; iii. "The Forum has supported over 1,000 scientists and stakeholders in more than 35 countries"; iv. "The work of Belmont Forum awardees has been featured in numerous periodicals and scholarly journals, including National Geographic, Nature, PLOS ONE, Global Change Biology and Sustainability Science"; v. "The Belmont Forum is implementing a global open data policy and principles with input from scientific and stakeholder communities"; saw. "Open data access has been developed through activity in four thematic areas: coordination, data planning, e-infrastructures, human dimensions".

Specifically in relation to the Sustainable Development Goals (SDGs), the BF develops several actions from the organization of events and project development to the financing of research that addresses specific goals and/or targets that make up the agenda<sup>3</sup>. This partnership, in turn, can be identified within the scope of Fapesp, as mentioned above. In this sense, the next section of this paper consists of bringing together both institutions, to understand how the collaboration was signed, which are the main areas of knowledge contemplated and other particularities about the cooperation agreement signed.

#### THE SCIENTIFIC COOPERATION BETWEEN FAPESP AND BELMONT FORUM

According to Paulo Artaxo, coordinator of the FAPESP Research Program on Global Climate Change (PFPMCG), the Belmont Forum refers to a set of funding agencies that finance international research projects, with a view to solving global science-based problems. Such projects contribute to the internationalization of Brazilian research and to the formulation of public policies, since they contemplate a variety of strategic themes of a multidisciplinary character. In this sense, Artaxo argues that Fapesp has a strong participation in the scope of the BF (FAPESP, 2020c), starting the relationship between both from 2010, during the administration of Celso Lafer.

Continuing the history of cooperation between them, Reynaldo Victória, mentor of the relationship between the Belmont Forum and Fapesp, indicates that until 2011 there was a discussion on how it would be possible to implement this new way of financing science and, after long debates between development agencies of the G-8 (United States, Japan, Germany, Canada, France, Italy, United Kingdom and Russia) and the BRICS (Brazil, Russia, India, China and South Africa), a conclusion was reached that had already been discussed previously, that is, any and all funding agencies participating in the Forum could suggest research calls for funding. At that time, Fapesp was already participating in these discussions in an official manner with the Forum. Therefore, Victoria, through her speech at the Webinar "Impacts of climate change on Brazilian society: Science focused on solutions produced by the Fapesp-Belmont Forum cooperation", held in June 2020 by the Fapesp Agency, adds that from the moment that an agency opens a call and receives funds from other interested agencies, such a specific call cannot be copied by other agencies, forcing the internationalization of the first. In the context of Fapesp, the author points out that such cooperation was very



advantageous, since "for each euro that Fapesp placed, 35 euros were placed by the other agencies" and, in this sense, points out that by 2019 more than 90 million euros were involved in calls between the two, benefiting several national and international researchers.

#### Actors and research agenda

According to Fapesp's institutional website (2020a), it is possible to verify a total of 13 cooperation calls between Fapesp and the BF in the period from 2012 to 2020, with more than 30 research grants granted through the Foundation (FAPESP, 2020a). Within the scope of such calls, we highlight the participation of funding agencies from different countries, especially from the Global North, as well as the selection of funded projects that, in their majority, have foreign universities as their Leading Institution, with only two Brazilian Leading Institutions selected. The themes addressed by the calls are in line with the strategic themes linked to the Belmont Forum, with the main form of promotion being aid for regular research in the country, whose duration varies between 1 and 5 years. The availability of financial resources by Fapesp, varies between 250 thousand and 1.5 million euros.

Table 1 - Calls for research proposals between Fapesp and Belmont Forum (2012-2020)

Year	Subject	Total resources available by Fapesp	No. of selected projects	Head office	Leading institutions	Funding agencies
2020	Transdisciplinary Research for Pathways to Sustainability	€250.000	2	USP (2)	University of Maryland Center for Environmental Science; Géosciences Environnemen t Toulouse	FAPESP, NSF, FWF, TUBITAK, NRF, Future Earth; ANR; REGIG
	Disaster Risk, Reduction and Resilience	€1 million	2	USP; Unesp	United Nations University; The Pennsylvania State University	Fapesp, NSF, UKRI, UNO
2019	Climate, Environment and Health	€750.000	2	USP; Governo do Estado de São Paulo	University College London; Stanford University	Fapesp, UKRI, Tübitak, WHO, NSF, PASRES, NOAA
2018	Transdisciplinary Research for Ocean Sustainability	€1 million	1	Unifesp	Södertörn University	Fapesp, FORMAS, RCN, NSF, MoES, NRF
	Science-Driven E- Infraestructures Innovation	€810.000	2	USP (2)	Fondation pour la Recherche sur	ANR, NSF, JST, FAPESP



					la Biodiversité; Sorbornne Université	
2017	Biodiversity and escosystem services	€ 1,5 million	1	INPE	Institut de Recherche pour le Développemen t	ANR, DFG, DLR, RCN, NSF, FAPESP
	Transformations to Sustainability	€600.000	4	Unicamp (2); FGV; USP	Center for Social- Ecological Landscape, Indiana University; University of ReadingUniver sity of WarwickUniver sity Wageningen	NSF, NWO, VR, FAPESP, ESRC, BMBF/DLR, ISSC, AKA
2016	Sustainable Urbanisations Global Initiative	€1 million	5	USP (2); FGV; Unicamp; Unesp	Maastricht University; FGV; National Taiwan University; Coventry University; Forschungsver bund Berlin e.V., Institut für Gewässerökolo gie	NWO, Formas, SEA, FFG, NSF, NRF, BMBF, FAPESP, MOST, JST, QNRF, AHRC, ESRC, RCN, Innovate UK3
2015	Climate Predictability and Inter-Regional Linkages	€1 million	4	Unicamp (2); FGV; USP	Indiana University; University of Reading; University of Warwick; University Wageningen	NSF, NWO, VR, FAPESP, ESRC, BMBF/DLR, ISSC, AKA
	Mountains as Sentinels of Change	€1 million	2	USP (2)	Centre National de la Recherche Scientifique; University of Minnesota	ANR, FAPESP, NSFC, NSF, DFG
2014	Biodiversity and escosystem services	€500.000	3	USP; Instituto Florestal do Estado de São Paulo; Unifesp	Centre National de la Recherche Scientifique (3)	ANR, CSIRO, DFG, FAPESP, JST, MoES, NSFC, NRF, RCN, NERC, ESCR, NSF
2013	Food Security	€ 1,5 million	Type 1:	USP	Type 1:	Type 1:



	and Land Use Change		1		Cranfield University	NERC-BBSR- ESCR, NSF, FAPESP, NRF
	(Type 1: Community building projects; Type 2: Collaborative research projects)		Type 2:	INPE; USP	Type 2: Scottish Food Security Alliance, University of Aberdeen; USP	Type 2: CSIRO, FAPESP, ANR, MOES, NRF, SNSF, NERC-BBSR- ESRC, NSF
2012	Freshwater Security and Coastal Vulnerability	-	4	USP (2); INPE; Univap	Rhodes University; University of South Florida; University of Minnesota; Marine Biological Laboratory	CSIRO, FAPESP, MoES, NRF, NERC-ESCR, NSF, ANR, DFG, JSPS, NSERC

Specifically, regarding the calls indicated in the table, the following is verified: i. in all notices, it is possible to note the existing incentive for the formation of new international research networks, with the mandatory requirement for researchers to participate in groups composed of at least three countries that are members of the BF; ii. Fapesp, as it constitutes itself as the institution that proposes the calls, has final responsibility regarding the financing decisions for the proposals selected by the BF; iii. although the research groups are composed of at least three different countries, Fapesp only finances the partner of the State of São Paulo in the scope of collaboration; iv. partner agencies are the main definers of the topics covered, which are detailed in the corresponding Implementation Plan, officially announced on the Belmont Forum website, and disseminated by the relevant agencies. For the themes covered, it is possible to verify total adherence to the institutional assumptions by the BF, integrating the perspective of transdisciplinary science, as well as the themes related to sustainable development and its adherence to the 2030 agenda.

Other results could also be verified in the scope of the consultation to the Fapesp Virtual Library, which concerns the research projects selected in joint calls between both institutions. In this research, a total of 95 scholarships and grants awarded between 2013 and 2020 were identified, with a greater incidence of funding in the large areas of Exact and Earth Sciences (whose predominance stands out in Geosciences), and Interdisciplinary and Applied Social Sciences (especially in the Urban and Regional Planning). The data related to the granting of scholarships and grants by large area can be seen in Table 2.

Table 2 - Educational and Research Scholarships by major area of knowledge

Major area of	Start Date								
knowledge	2013	2014	2015	2016	2017	2018	2019	2020	Total
Agrarian Sciences			3				2		5



Biological Sciences	2	1	6	3					12
Health Sciences								2	2
Exact and Earth Sciences			3	11	6	4	3	1	28
Human Sciences		1			1	2	5	2	11
Applied Social Sciences	3	1	1			5	4		14
Engineering								2	2
Interdisciplinary	1	1	3	2		5	6	3	21
Total	6	4	16	16	7	16	20	10	95

Regarding the types of support granted by Fapesp to the BF, the following classification is given: Educational and Research Scholarships in Brazil. For the first, regular grants (23 results) and thematic projects (8) stand out, and, regarding the second classification, postdoctoral scholarships (31), technical training scholarships (25), scientific initiation (6) and doctoral scholarships (direct) (2). Regarding the host institutions linked to the grants and aid granted, there are 46 results referring to the University of São Paulo (USP), 14 linked to the National Institute for Space Research (INPE), 12 linked to the University of Campinas (Unicamp), 8 linked to the Getúlio Vargas Foundation (FGV), 5 linked to the University of Vale do Paraíba (UNIVAP), 4 linked to the São Paulo State University (UNESP), 2 linked to the National Center for Monitoring and National Disaster Alerts (CEMADEN) and the Federal University of São Paulo (Unifesp) and 1 linked to the Health Department of the State of São Paulo and to the Environment Department of the State of São Paulo. As seen, there is a direct relationship between such grants and aid granted to the State Government of São Paulo, evidencing one of the specific objectives of the projects that refers to the formulation of public policies on the topics addressed. In addition, institutions abroad linked to the awarding of scholarships and grants are added, with the predominance of Higher Education Institutions (HEIs) from countries in the Global North, such as the United States, United Kingdom, France, among others. The list of institutions and countries involved identified in this survey can be seen in Table 3.

Table 3 - International HEIs and Funding Agencies involved in the Educational and Research Scholarships (2012-2020)

HEIs and Funding Agencies	Countries	Total
Any institutions involved	-	70
Coventry University; University of Bath; University of Cape Town (UCT); University of California, Santa Cruz (UC Santa Cruz); University of Reading	UK, USA, South Africa	1
Cranfield University	UK	1
Groupe de Recherche en ç‰conomie Théorique et Appliquée (GREThA)	France	1
Institut d'ecologie et des Sciences de	France	1



l'Environnement de Paris (IEES)		
Institute de Recherche pour le Développement (IRD)	France	1
Instituto Franco-Argentino sobre Estudios de Clima y sus Impactos (IFAECI)	Argentina	1
Marine Biological Laboratory (MBL)	USA	1
Pennsylvania State University; De Montfort University	USA, UK	1
Research Institute for Humanity and Nature (RIHN); National Taiwan University (NTU); University of Illinois at Urbana-Champaign; Hamad Bin Khalifa University (HBKU)	Japan, Taiwan, USA, Qatar	1
Rhodes University	South Africa	1
Södertörn University	Sweden	1
Stanford University	USA	1
Stellenbosch University; Leuphana University of Lüneburg; Maastricht University, Maastricht (UM); Arizona State University, Phoenix (ASU); Lund University; Universität f. Bodenkultur Wien	South Africa, Germany, Netherlands, USA, Sweden, Austria	1
United Nations University Institute for Integrated Management of Material Fluxes and of Resources (UNU-FLORES)	UN-USA	1
Université de Versailles Saint-Quentin-en-Yvelines (UVSQ)	France	1
Université Joseph Fourier; Université Joseph Fourier	France	1
Université Montpellier 2	France	1
Université Paris-Sorbonne (Paris 4)	France	1
University College London (UCL)	UK	1
University of Aberdeen	UK	1
University of Minnesota (U of M)	USA	2
University of South Florida (USF)	USA	1
University of Washington; Wageningen University; University of Gothenburg	USA, Netherlands, Sweden	1
Yale University; United Nations University Institute for Integrated Management of Material Fluxes and of Resources (UNU-FLORES); Ming Chuan University, Taoyuan (MCU); ICLEI Cities Biodiversity Center (CBC); Stockholm University	USA, UN-USA, Taiwan, South Africa, Sweden	1
Total		95

As seen, the cooperative relationship between Fapesp and the Belmont Forum only became institutionalized in 2012, when there was the first joint call between both institutions. Among the calls, scholarships and grants granted among these, the involvement of development agencies and Higher Education Institutions in the countries of the Global North stands out, having little impact on the part of the scientific community of the countries of South America and,



mainly, of Asia. Regarding the large areas of knowledge contemplated, the Exact and Earth Sciences gain prominence, followed by the Interdisciplinary area, corroborating the premises shared by the Belmont Forum. Likewise, the topics covered are also associated with the strategic themes signed within the scope of the BF, indicated in the previous session of this paper and agreed upon between the agencies involved.

#### Impacts in the context of São Paulo State Universities

Within the scope of such a survey, it is also possible to specify the impact of the relationship between Fapesp and Belmont Forum with the state universities of São Paulo: University of São Paulo (USP), University of Campinas (Unicamp) and São Paulo State University (Unesp); as well as regarding the contemplation of the Sustainable Development Goals in the contemplated research projects. As seen in the figure below, specifically in relation to São Paulo state universities, 46 projects are linked to USP, 12 to Unicamp and 4 to Unesp. About the main major areas of knowledge covered, these are again linked to Exact and Earth Sciences and Interdisciplinary, respectively. For the countries involved in the collaborations, the Global North is highlighted.

Table 4 - Impact of cooperation between Belmont Forum and Fapesp within the scope of Unicamp, USP, Unesp (2012-2020)

Category		Unicamp	USP	UNESP	Total	General Total	%
	No. Educational and Research Scholarships	12	46	4	62	95	65,25
	No. published papers	29	52	0	81	145	55,85
General Data	No. HEIs and Funding Agencies involved	5	21	5	31	44	70,45
	No. SDGs contemplated	1; 2; 6; 7; 10; 11; 13; 14; 15; 16	1; 2; 3; 6; 7; 8; 10; 12; 13; 14; 15; 16	1; 2; 7; 11; 13; 14	-	-	-
No. Scholarships by area of knowledge	Agrarian Sciences	0	1	2	3	5	60
	Biological Sciences	0	11	0	11	12	91,66
Miowicage	Health Sciences	0	1	0	1	2	50



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	Exact and Earth Sciences	2	20	0	22	28	78,57
	Human Sciences	7	0	0	7	11	63,63
	Applied Social Sciences	2	3	0	5	14	35,71
	Engineering	0	1	1	2	2	100
	Interdisciplinary	1	9	1	11	21	52,38
	South Africa	1	1		2	3	66,66
	Germany		2		2	3	66,66
	Argentina				0	1	0
	Austria		1		1	1	100
	United States	1	2	2	5	7	71,42
	France		1		1	2	50
No. International	Netherlands			1	1	2	50
Collaborations	UK	1	1	1	3	3	100
	Japan		1		1	1	100
	Qatar		1		1	1	100
	Sweden		1	1	2	4	50
	Taiwan		1		1	2	50
	Multinational Organizations	3	7	2	12	18	66,66

Therefore, regarding the impact of this collaboration on the contemplated SDGs, it was possible to identify the following connections between such objectives, as shown in Figure 1. Within the scope of such projects, the main contemplated SDG refers to n. 13, Climate Action, which establishes direct relations with the other SDGs, such as those in n. 2, 6 and 16, among others. The relationship between these objectives refers to the very intersection between them since they can be considered transversal and interdependent. Other SDGs such as those of n. 4, 5, 9 and 17 were not identified in this survey.



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Figure 2 - Connections between the SDGs contemplated in the collaboration between Belmont Forum and Fapesp (research projects USP, Unicamp and Unesp)

When illustrating the way in which the SDGs are incorporated into the scope of research projects financed by this collaboration, specifically within the scope of projects linked to São Paulo state universities, this figure reiterates the connections established within the scope of the publication "A guide to SDGs interactions: from Science to implementation" (ISCU, 2017). Likewise, it presents the way in which the SDGs have been incorporated through funding for scientific research, in view of the role of science in relation to the achievement of such global objectives. In turn, it is interesting to see that SDGs related to Quality of Education (SDG 4), Gender Equality (SDG 5), Industry, Innovation and Infrastructure (SDG 9) and Partnerships and Means of Implementation (SDG 17) were not incorporated. The absence of such SDGs in the contemplated projects, allows us to make the following hypothesis: certain SDGs are prioritized in joint calls between agencies, as is the case of SDG 13. In fact, as it is an international development agency, the agenda of research related to the SDGs contemplates themes with strong relevance on the part of the SDG, that is, on the part of the Belmont Forum, which refers to a network composed mainly of agencies and institutions from the Global North. This pattern of research related to the SDGs can be seen in the report published by Elsevier (2020), which highlights that "most of the research relating to SDGs stems from high income countries while only a very low percentage across the first 16 SDGs originates from low-income countries. The SDGs most researched are SDGs with strong relevance for industrialized countries" (ELSEVIER, 2020, p. 5).



#### **FINAL CONSIDERATIONS**

This paper aimed to explore the relationship established between Fapesp and Belmont Forum, in view of the cooperation agreement signed between both institutions for the financing of scientific research. Therefore, it was possible to observe the following: i. a process of internationalization of Fapesp is underway with several actors in the scientific community, mainly after the 1990s; ii. this process has as one of its main characters the Belmont Forum, which is composed of several development agencies in the world that finance research related to global changes; iii. the relationship between the two, which began in 2010, is viewed by some Fapesp leaders as beneficial and advantageous, both for the internationalization of Brazilian research and for the formulation of public policies and the solution of global science-based problems; iv. most of the agencies involved in the 13 calls made between them are from countries in the Global North, such as the United States and the United Kingdom, with less collaboration with agencies in countries in Latin America and Asia; v. the themes considered in the calls, as well as the major areas of knowledge most covered, incorporate Exact and Earth Sciences as a central axis, as well as interdisciplinarity, bearing in mind the principles postulated by the Belmont Forum in its institutional documents; vi. the Sustainable Development Goals could also be identified in the data survey, with greater incorporation in relation to SDG n. 13, as well as the observation regarding the intersection between the SDGs themselves, which are transversal and interdependent.

Considering the presented and the achievement of the main and specific goals of this paper, some questions can be asked to deepen the relationship drawn between them, such as the following: i. what is the degree of autonomy of Fapesp in relation to the determination of research themes and agendas to be financed in Brazil?; and, ii. are public calls for research funding induced by the institution Belmont Forum?, that is, is there a process of importing the research agenda guided by this institution?. To resolve these issues, qualitative data must be collected about cooperation, extrapolating the information presented in this paper. Other questions can also be added, considering a future research agenda, such as the following: iii. to what extent is the funded research agenda really "national"?; iv. what results / implications can be obtained through this financing in the formulation of national public policies?; among others.



# A trajetória da colaboração internacional entre a FAPESP e o Belmont Forum: um estudo baseado em temas dos objetivos de desenvolvimento sustentável

#### **RESUMO**

Este artigo visa explorar a trajetória da colaboração científica internacional entre a Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP/Brasil) e o Belmont Forum, tendo em vista os temas relacionados aos Objetivos de Desenvolvimento Sustentável. Metodologicamente, o estudo é baseado em revisões bibliográficas e consultas às bases de dados institucionais de nosso estudo de caso. Os resultados mostram que o processo de internacionalização da Fapesp envolve uma série de atores da comunidade científica; tal processo tem como um de seus principais personagens o Belmont Forum; grande parte das agências envolvidas nas 13 convocatórias feitas em conjunto são de países do Norte Global; os temas abordados nas convocatórias, assim como as grandes áreas de conhecimento contempladas, incorporam como eixo central a ciência interdisciplinar e os desafios relacionados ao desenvolvimento sustentável.

**PALAVRAS-CHAVE:** Colaboração internacional. Política de Ciência e Tecnologia. Belmont Forum. FAPESP. Objetivos de Desenvolvimento Sustentável.



#### **NOTES**

- <sup>1</sup> In this paper, we will consider the terms "collaboration" and "cooperation" as synonyms, not forgetting that some authors have differentiations between them.
- <sup>2</sup> The current headquarters of the Belmont Forum secretariat is located in Montevideo, Uruguay, with the Ibero-American Institute for Research on Global Changes (IAI). Previously, the secretariat was at the Agence Nationale de la Recherche (ANR) in France.
- <sup>3</sup> According to Purcell et al. (2019, p. 1344), "in 2015, 193 countries came together to define and adopt the sustainable development goals (SDGs) the first agreed actionable agenda by the global community for all citizens comprising a suite of objectives and targets for worldwide sustainable development by the year 2030 to end poverty, protect the planet and ensure that all people enjoy peace and prosperity".

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