



NARODOWA AGENCJA
WYMIANY AKADEMICKIEJ

ACADEMIC COOPERATION
BETWEEN POLAND AND PERU



opracowanie

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INTRODUCTION

The aim of this study is to present a picture of academic cooperation between Poland and Peru. Academic cooperation is understood here in a broad sense, including both individual and institutional cooperation.

The study is exploratory as well as practical and answers the following questions:

- What is the volume of publications by Polish and Peruvian co-authors?
- What thematic fields prevail in this regard?
- How intense has this cooperation been over the years?
- What higher education institutions in Poland cooperate with their Peruvian counterparts most intensely?
- Which Polish universities host the greatest number of students from Peru?

The study is addressed to the broadly understood academic community and the environment of higher education and scientific institutions as well as to Poland's policy-makers with regard to international academic cooperation.

The study is based on data available in SCOPUS¹, OECD, WORLD BANK, UNESCO and POLon databases.

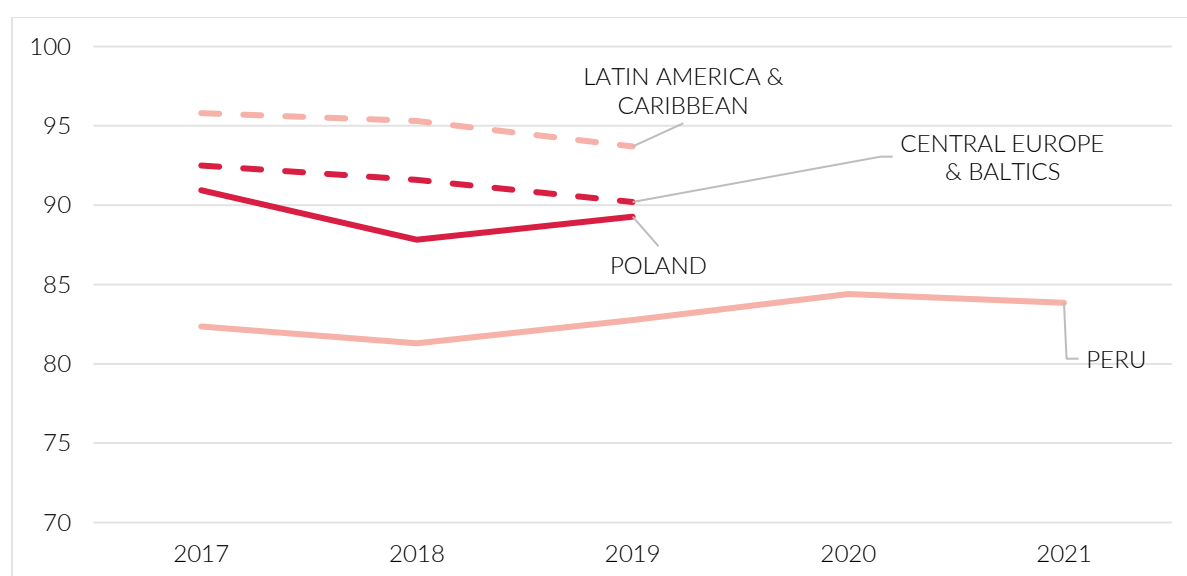
Due to the small size of the groups of Peruvian students and employees studying or working at Polish universities, this study presents only the data necessary to guarantee the anonymity of these individuals.

¹ Access to the SCOPUS database and the SciVal tool under a national licence provided by the Ministry of Education and Science.

1 POLAND AND PERU – BASIC DATA

Below we present aggregate figures based on World Bank's estimates² from official responses to the annual education survey. Current expenditures are calculated on an annual basis and are expressed as a percentage of direct expenditures in public educational institutions at a specific level of education. They include staff salaries and current expenses other than staff salaries (e.g., teaching materials, support services and administration). Student financial aid and other transfers are excluded from these expenses. In order to gain a broader comparative perspective, Peru's and Poland's data were also cross-referenced with data describing the regions in which both countries are located, namely Central Europe and the Baltics and Latin America and the Caribbean³.

Chart 1 Current expenditure on education and higher education (as % of total expenditure in public higher education institutions)



Source: World Bank (Accessed on 23 May 2023)

Current spending on higher education in Peru is significantly lower (83% in 2019 and 84% in 2021) than the average for countries in the region (94% in 2019). However, it is not possible to compare later years, as the relevant data are not yet available in World Bank databases. In Poland, after a decline in current spending on higher education in 2018 (from 91% in 2017 to 88% a year

² <https://data.worldbank.org/indicator>

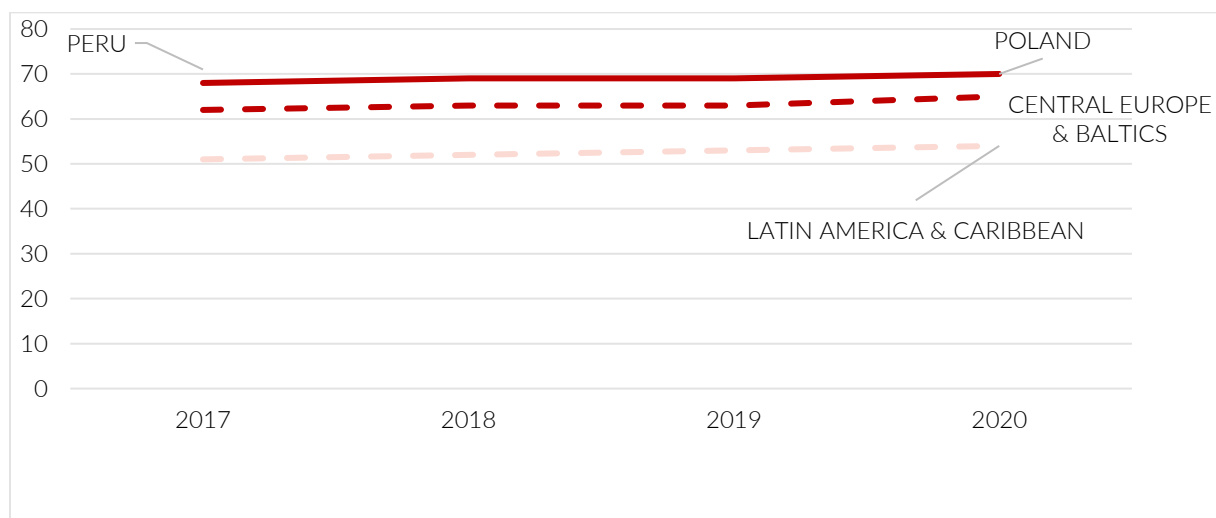
³ *Central Europe & the Baltics*: Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, **Poland**, Romania, Slovak Republic, Slovenia

Latin America & Caribbean: Antigua and Barbuda, Argentina, Aruba, Bahamas, Barbados, Belize, Bolivia, Brazil, British Virgin Islands, Cayman Islands, Chile, Colombia, Costa Rica, Cuba, Curacao, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, **Peru**, Puerto Rico, Sint Maarten (Dutch part), St. Kitts and Nevis, St. Lucia, St. Martin (French part), St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, Turks and Caicos Islands, Uruguay, Venezuela, RB, Virgin Islands (U.S.)

later), there was an increase in this indicator to 89% in 2019. However, at the same time, a decrease in the countries of the Central European region and the Baltic states (from 92% in 2017 to 90% in 2019) is observed. Unfortunately, later data are not available.

Obtaining higher education qualifications, whether or not it leads to advanced scientific qualifications, usually requires, as a minimum condition of admittance, the successful completion of secondary education. Data showing the levels of gross enrolment rates are presented below, which reflect the capabilities of each level of the education system (here: higher education). However, it should be noted that the high rate may reflect a significant number of student-age people who enrol at universities later, for instance due to repeating a year or starting education late, rather than a successful education system. The gross enrolment ratio for universities is calculated by dividing the number of university students regardless of their age by the population of the age group that officially corresponds to higher education, multiplied by 100.

Chart 2 Gross enrolment ratio - comparative data



Source: World Bank (Accessed on 23 May 2023)

Unfortunately, there are huge gaps in data for Peru and the latest available data is for 2017, when it was reported that the tertiary enrolment ratio was 71%. At the same time, it was 68% in Poland. However, it is not possible to compare the situation of Peru to other countries or regions in later years. The chart above clearly shows that the enrolment ratio for Poland as well as Central European countries as of 2017 is well above the global average. In 2020, the ratio for Poland was 70%, for Central Europe and the Baltics – 71%, and for Latin America and the Caribbean – 54%. At the same time, the world average was much lower, namely 38%.

Unfortunately, data presented by [UNESCO](#) on where foreign students in Peru come from are not available. What we do know, however, are countries with the largest number of **Peruvian students**. They comprise **Argentina** (nearly 18,000), **the US** (3,398), **Spain** (3,106) and **Chile** (2,681).

Polish data from the POLon system show that the group of **Peruvian students** accounted for several dozen people in the 2021/22 academic year. One in five studied management, and one in four studied computer science or international relations. As for the geographic distribution of the universities, Warsaw and the Dąbrowa Basin prevail.

On the other hand, academics from Peru constituted isolated cases; hence, no characteristic of this group will be presented.

Another significant measure describing international scientific cooperation are joint publications. **Worldwide**, among the publications that appeared in sources indexed in the SCOPUS database, one in two pertained to the area of Natural Science, followed by Engineering and Technologies and Medical Science. In terms of the number of publications by authors affiliated with institutions grouped by country of affiliation, the top three countries are: China, the US, and the UK. **Peru is in the sixth ten, and Poland ranks in the second ten.**

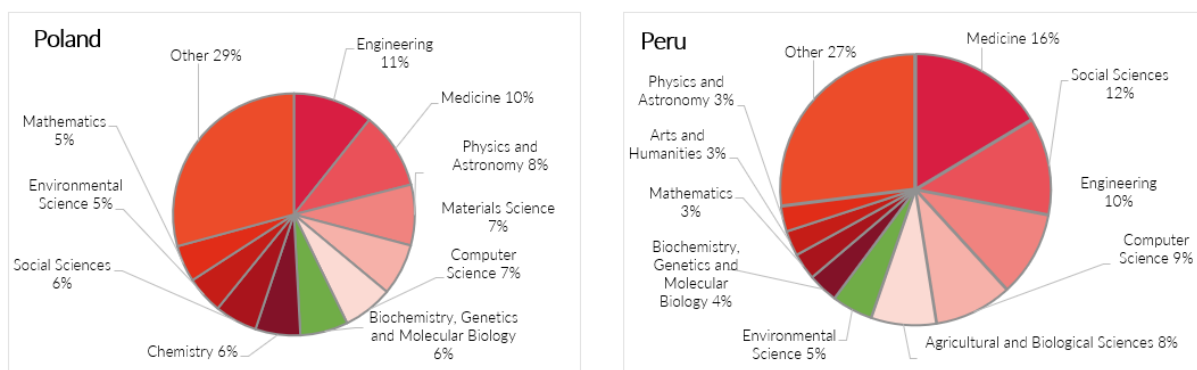
Table 1 Comparison of the number of publications by Polish and Peruvian scientists (2017–2022⁴)

Publication year	Number of publications	
	Poland	Peru
2022	59,163	8,980
2021	63,167	7,850
2020	59,303	6,335
2019	56,073	4,730
2018	53,182	3,629
2017	50,310	3,051
Total:	341,198	34,575

Source: SCOPUS-SciVal [accessed: 24/05/2023]

The pool of indexed publications for 2017–2022 authored by researchers affiliated with Polish institutions was 10 times larger than by those affiliated with Peruvian ones in the same period. However, it is interesting to observe the change in the number of publications in the two countries – in the case of Poland, there was an average increase of 6%, while in Peru the average increase was 24%.

Chart 3 Publications of Polish and Peruvian scientists by area of knowledge (%) – comparison

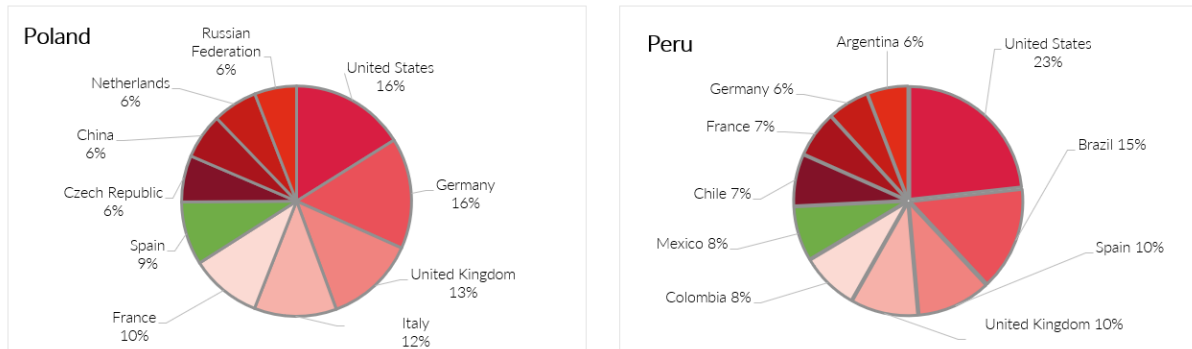


Source: SCOPUS-SciVal [accessed: 24/05/2023]

⁴ The data for 2022 is updated on an ongoing basis, so it is expected that the second half of 2023 will see increases in both publications that appeared in 2022 and their citations.

The thematic field of the prevailing number of publications overlaps between the analysed countries – Polish scientists focus in their publications primarily on the areas of Engineering; Medicine; Physics and Astronomy; and Social Science.

Chart 4 Countries of origin of co-authors of publications by Polish and Peruvian scientists – comparison (%)



Source: SCOPUS-SciVal [accessed: 24/05/2023]

There is little overlap in the countries of origin of co-authors of publications with at least one scientist affiliated with a Polish institution and one with a Peruvian institution, and these include colleagues from the US and the UK. Polish scientists mainly cooperate with their European counterparts and Peruvian scientists with those from South America. Among European countries (in addition to the UK), simultaneous cooperation with the Spanish, French and Germans was observed on the Polish and the Peruvian side.

Chart 5 Sustainable Development Goals (SDGs)⁵. Relative Activity Index⁶ (RAI) – Poland-Peru comparison (2017–2021)



Source: SCOPUS-SciVal [accessed: 24/05/2023]

Another field that was used to compare Polish and Peruvian input into the development of global science are publications identified as those responding to one of the UN Sustainable Development Goals (hereafter: SDG). Globally, among publications assigned to SDG 1–16, those pertaining to health and well-being (SDG 3) prevail. The number of publications in the field of sustainable energy access (SDG 7) is eight times lower, although it is the second most published goal globally.

If we look at the share of scientists from both countries in a given field (the field being the SDG) in relation to the global share of publications in the same field (RAI), we see that the largest share of output in Poland concerns the goal focusing on solving problems of ensuring sustainable consumption and production (SDG 12). In Peru, on the other hand, researchers focus on other areas, and they comprise: life on land (SDG 15), quality education (SDG 4) and zero hunger (SDG 2).

⁵ SCOPUS provides indicator values for SDGs 1–16. SDG 17 is not monitored in the database.

⁶ The Relative Activity Index (RAI) is defined as the share of an individual's (here: a country's) publications in a given field compared to the global share of publications in the same field. A value of 1.0 means that an institution's research activity in a particular field corresponds exactly to global activity in that field; a value higher than 1.0 indicates greater emphasis; and a value lower than 1.0 suggests less emphasis. In the case of the SDGs, to obtain a percentage result, the RAI is calculated by looking at the total number of publications on a given SDG by an institution, divided by the total number of publications by the same institution. The same calculations are performed for each global SDG. An index for an institution is calculated by dividing the percentage for the institution by the global percentage.

2 POLISH-PERUVIAN SCIENTIFIC COOPERATION (2017–2022)

This section will analyse cooperation in terms of publications of scientists affiliated with Polish and Peruvian scientific institutions. Only those publications were taken into account in which at least one author indicated that they belonged to the Polish and the Peruvian academic community at the same time.

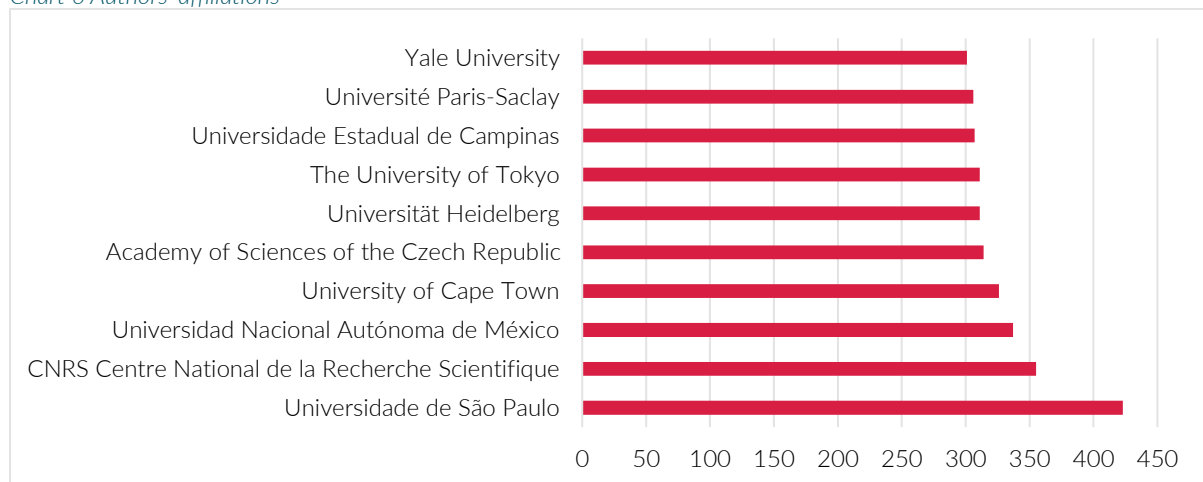
Table 2 Joint Polish-Peruvian publications in the SCOPUS database

Publication year	Number of publications
2022	182
2021	138
2020	136
2019	106
2018	90
2017	76
Total:	728

Source: SCOPUS-SciVal [accessed: 24/05/2023]

Publications under Polish-Peruvian cooperation in the analysed period accounted for less than one percent (0.2%) of all publications by Polish authors indexed in the SCOPUS database. A change in Polish-Peruvian publication cooperation during this period is evident, **as it doubled** between 2017 and 2022.

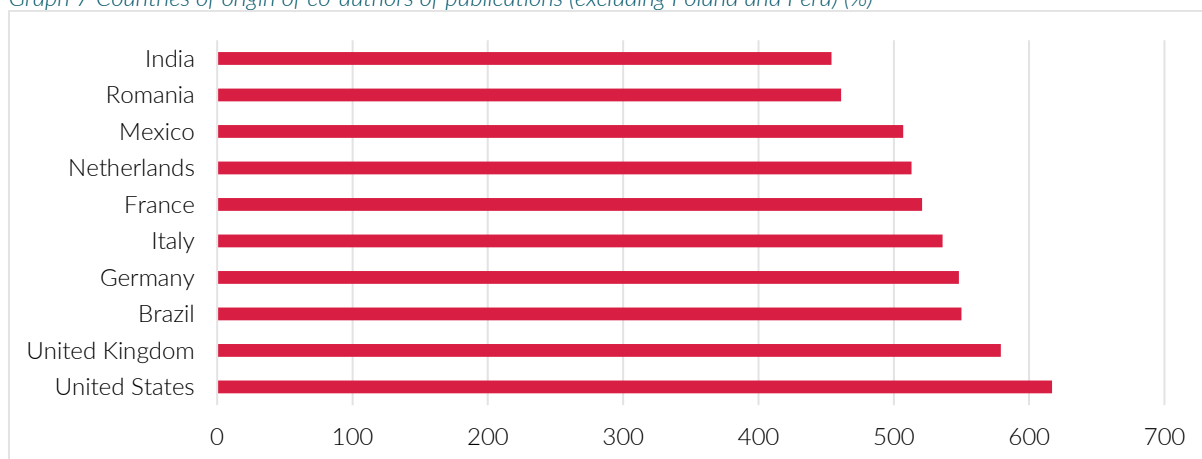
Chart 6 Authors' affiliations



Source: SCOPUS-SciVal [accessed: 24/05/2023]

Brazilian and Mexican institutions prevail among the ten most popular affiliations. Interestingly, the first Peruvian institution is ranked 19th and it is the Pontificia Universidad Católica del Perú, while the Polish one is ranked 23rd (the Henryk Niewodniczański Institute of Nuclear Physics of the Polish Academy of Sciences).

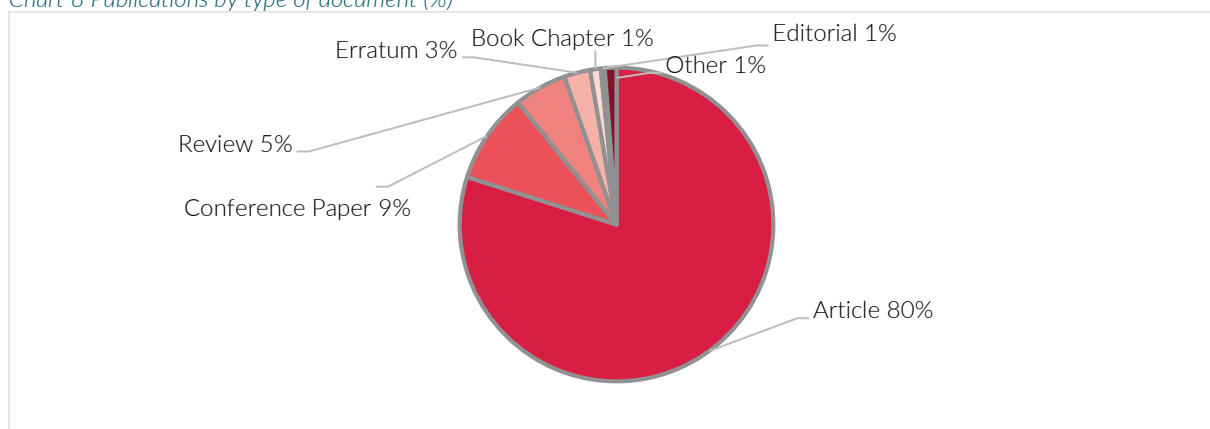
Graph 7 Countries of origin of co-authors of publications (excluding Poland and Peru) (%)



Source: SCOPUS-SciVal [accessed: 25/05/2023]

A far greater geographic diversity than in the case of the most productive institutions in Polish-Peruvian scientific cooperation is observed if we look at the co-authors' countries of origin. Poland and Peru were intentionally not included in the graph above, as it is obvious that each of the 728 publications must have included at least one Pole and one Peruvian at the same time. Thus, in addition to the countries that are the subject of this analysis, **the co-authors most often originated from American, British and Brazilian institutions.**

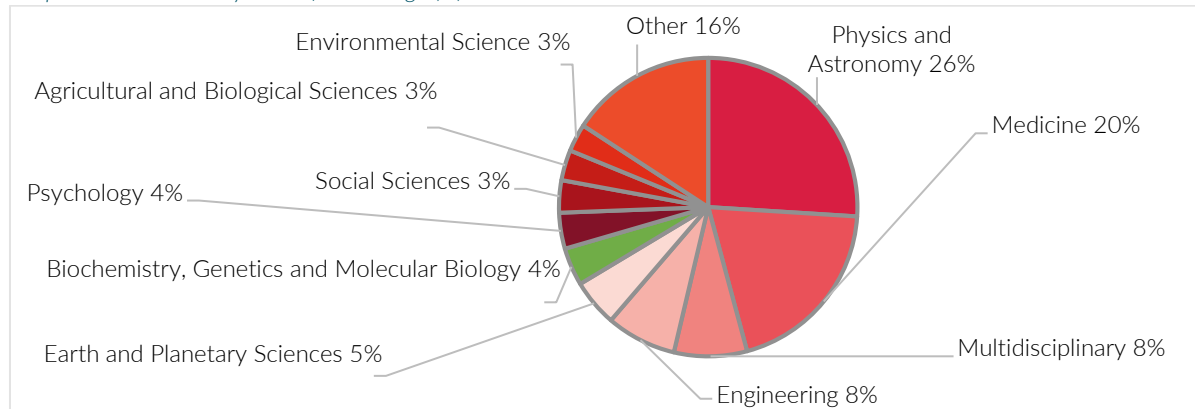
Chart 8 Publications by type of document (%)



Source: SCOPUS-SciVal [accessed: 25/05/2023]

In terms of the type of joint publications, articles in scientific journals prevail, accounting for 80% of all joint Polish and Peruvian publications. It is interesting to note that a book chapter appears in the chart above as a kind of joint scientific contribution. The chapters covered the following areas: Earth and Planetary Sciences (6 chapters); Engineering (6); Arts and Humanities (5); Social Science (5); Agricultural and Biological Sciences Biochemistry (2), Genetics and Molecular Biology (1); Business, Management and Accounting (1); Economics, Econometrics and Finance (1); Environmental Science (1); Materials Science (1); Physics and Astronomy (1). The areas indicated overlap with those presented below and related to the general subject of joint publications. The Earth and Planetary Sciences area stands out in particular (5% of all joint publications, regardless of type).

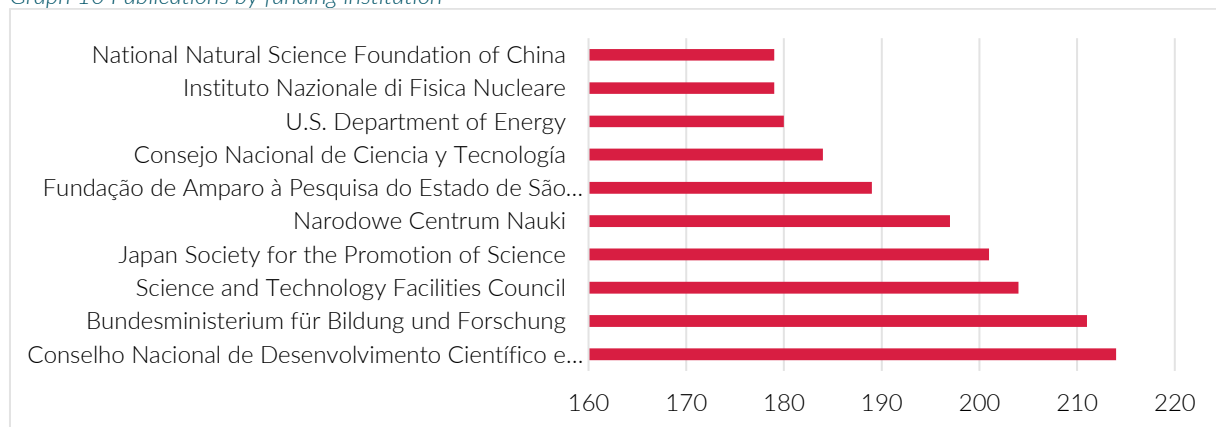
Graph 9 Publications by area of knowledge (%)



Source: SCOPUS-SciVal [accessed: 25/05/2023]

Scientists from Poland and Peru focus in their joint publications primarily on the research areas of physics and astronomy as well as medicine.

Graph 10 Publications by funding institution



Source: SCOPUS-SciVal [accessed: 25/05/2023]

The institution with the largest financial contribution in the area of supporting the creation of Polish-Peruvian publications is the **Brazilian** federal agency [Conselho Nacional de Desenvolvimento Científico e Tecnológico](#), whose mission is to *Support science, technology and innovation and participate in the elaboration of its policies, contributing to the expansion of the frontiers of knowledge, sustainable development and national sovereignty*⁷. Amongst Polish institutions co-funding publications, the National Science Centre has made the largest contribution, that is it has contributed to 197 out of 728 publications. Most of these focused on the area of Physics and Astronomy (172 publications).

⁷ <https://www.gov.br/cnpq/pt-br/>

3 NAWA'S CONTRIBUTION TO POLISH-PERUVIAN SCIENTIFIC COOPERATION

Among all publications written in Polish-Peruvian cooperation, as many as five were financed or co-financed by the Polish National Agency for Academic Exchange (NAWA) in the period 2017–2022. The first publications (chronologically) are those from 2020 (NAWA was established in October 2017).

Table 3 Affiliations of authors of publications co-funded by NAWA

Authors' affiliations	Number of publications	Authors' affiliations	Number of publications
Eötvös Loránd Tudományegyetem	4	Tilburg University	3
Iscte - Instituto Universitário de Lisboa	4	HSE University	3
Università degli Studi di Padova	3	Sakarya Üniversitesi	3
Victoria University of Wellington	3	Taras Shevchenko National University of Kyiv	3
Universität Mannheim	3	University of Southampton	3
University of Lagos	3	Universitatea din Oradea	3
Universidade Federal da Paraíba	3	Universidad Católica del Norte	3
Thammasat University	3	Karnatak University	3
Cardinal Stefan Wyszyński University in Warsaw	3	Academy of Sciences of the Czech Republic	3
New Bulgarian University	3	University of Leicester	3

Source: SCOPUS-SciVal [accessed: 25/05/2023]

Due to the fact that these publications are written by many authors, the researchers are affiliated with numerous institutions (more than 100). The leading institutions in the cooperation listed in the table above do not overlap with those presented when analysing the affiliations of Peruvian and Polish co-authors of publications. Here, one Polish university is ranked in the top twenty, i.e. **Cardinal Stefan Wyszyński University in Warsaw** (3 publications). Universities ranked lower include: the **Jagiellonian University** (2 publications), the **University of Gdańsk** (2), and the **University of Warmia and Mazury in Olsztyn** (1). In terms of thematic fields, the authors most often focus on the area of **psychology**, followed by **agriculture**; **medicine**; and **social sciences**. The rest of the areas are not covered.

Study prepared by:

dr Jolanta Buczek (NAWA)

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Polish National Agency for Academic Exchange
ul. Polna 40
00-643 Warszawa
phone no. (22) 390 35 00
www.nawa.gov.pl

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