



RESEARCH INFRASTRUCTURES (RI)

ANALYSIS ON THE CELAC LANDSCAPE OF RESEARCH INFRASTRUCTURES

Date: June 2019

Document No: WP04-DI-123

Version: V3.1

Status: Final

Deliverable No: D4.2

Task Leader: DLR



DOCUMENT INFORMATION

Title	ANALYSIS ON THE CELAC LANDSCAPE OF RESEARCH INFRASTRUCTURES
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Distribution	To members of the SOM working Group on Research Infrastructures
Document No	WP4-DI-123

DOCUMENT HISTORY

Date	Revision no	Prepared by	Approved by	Description
13.09-2017,	V1.1	Sophie Knebel		Initial draft
Revised 19.09.2017	1.2	Sophie Knebel	European Commission	
27.12.2017, revised	V2.1	Sophie Knebel		Adapted after the Montevideo meeting in preparation for the EU-LAC RI Meeting in Brussels in March 2018.
16.02.2018	V2.2	Sophie Knebel	Ministerio de Educación y Cultura (MEC), Uruguay as co-chair of the SOM WG on Research Infrastructures	
30.03.2018	V.2.3	Sophie Knebel	Ramon Torrent	Adapted after the EU-LAC RI Meeting in Brussels in March 2018.
30.06.2019	V.3.1	Kathrin Megerle, Stephanie Splett-Rudolph	Ramon Torrent	Adapted on basis of midterm expert review report from July 2018.

ACKNOWLEDGEMENT

EULAC FOCUS has received funding from the European Union's Horizon 2020 research and innovation programme under grant no 693781.

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Contents

Document Information 2

Document History 2

Acknowledgement 2

Disclaimer 3

Summary 7

1 Background 9

2 European perspective on RIs 12

3 LAC perspective on RIs 14

4 Objectives and Methodology 16

5 Survey results 18

5.1 General description 18

5.2 Categories 19

5.2.1 Type of Research Infrastructure 19

5.2.2 Scale 19

5.2.3 Access policies 20

5.3 Country Summaries 20

5.3.1 Argentina 21

5.3.2 Barbados 24

5.3.3 Bolivia 25

5.3.4 Brazil 27

5.3.5 Chile 30

5.3.6 Colombia 33

5.3.7 Costa Rica 37

5.3.8 Cuba 41

5.3.9 Ecuador 43

5.3.10 El Salvador 45

5.3.11 Guatemala 46

5.3.12 Honduras 46

5.3.13 Mexico 48

5.3.14 Nicaragua 50

5.3.15 Panama 52

5.3.16 Paraguay 54

5.3.17 Peru 54

5.3.18	Uruguay.....	55
5.3.19	Venezuela.....	58
6	Suggestions for LAC regional cases and approaches	60
6.1	Suggestion 1: Expand existing regional infrastructures and its initiatives.....	60
6.2	Suggestion 2: Networking programmes as intermediaries.....	60
6.3	Suggestion 3: Sub-regional hubs.....	61
6.4	Suggestion 4: Collaborations among thematic research institutions	62
6.5	Suggestion 5: First steps for the collaboration: Self-Assessment of the national RIs.....	68
7	Bibliography	69
Appendix A	List of countries and institutions that received the survey	71
Appendix B	Cuba: List of Research Infrastructures	73
Appendix C	MERIL Self-Assessment Form for Prospective New Entries.....	77

SUMMARY

This document reports on the national capacities of Research Infrastructures (RI) in Latin American and Caribbean (LAC) countries. It summarizes the current political dialogue between the EU and LAC and presents a selection of national and multinational RI open or ready to be opened for international collaboration. The selection is based on two surveys among the national representatives of the Senior Officials Meeting working group on RI, which served as a starting point for the discussion on political collaboration by presenting suggestions for the future collaboration.

The European Commission asked EULAC Focus to support the political dialogue by preparing this document on the basis of the surveys in order to formulate political recommendations. DLR as responsible for this EULAC Focus provided the participants with a first version of this document as preparation for the Intra-LAC meeting on Research Infrastructures in September 2017 in Montevideo, Uruguay. A developed version was provided to all participants of the first EU-LAC meeting on Research Infrastructures that took place in March 2017 in Brussels. An updated version, including additional information from the ongoing mapping process on Research Infrastructures within the LAC region, was released in June 2019.

1 BACKGROUND

During the EU-CELAC academic summit in June 2015 in Brussels, Commissioner Carlos Moedas appreciated the advances in the Joint Initiative on Research and Innovation (JIRI) by envisioning an EU-CELAC common research area (CRA). This idea was further consolidated by agreeing on the following three strategic pillars of this CRA at the latest EU-LAC¹ Seniors Officials Meeting (SOM) in March 2016 in Brussels:

1. Mobility of Researchers;
2. Increased thematic cooperation to address global challenges and the International outreach of Research Infrastructures (RIs);
3. Societal Challenges such as health, sustainable urbanization and clean urban transport.

Across all scientific areas, RIs are playing an ever increasing role in the search for scientifically-based solutions to the problems being faced by society. They are being used by the research communities to conduct research and foster innovation in their fields as they offer unique research opportunities to users from different countries and from different disciplines.

According to the [European Commission](#), the term Research Infrastructures (RIs) refers to “*facilities, resources and services used by the science community to conduct research and foster innovation. Some examples are: major scientific equipment (e.g. vessels, observatories), resources such as collections, archives, laboratories or scientific data, e-infrastructures such as data and computing systems, and communication networks. They can be single-sited (a single resource at a single location), distributed (a network of distributed resources), or virtual (the service is provided electronically).*”²

To further enhance the cooperation regarding this issue, a bi-regional working group on Research Infrastructures was established with the objective to support the policy making in the RI dimension and to facilitate the use of multilateral initiatives of Research Infrastructures between both regions.

According to the Terms of Reference of the SOM Research Infrastructure Group, the main activities are to:

- support the development of a coherent and strategy-led regional approach to policy making on RIs in LAC;
- share good practices in RI road mapping process and methodology;
- exchange experiences on management of RIs including related human resources issues, skill development aspects, access policies and industry involvement;

¹ Due to the current political developments in Latin America and the Caribbean the neutral, geographic term LAC (Latin America and the Caribbean) will be used instead of CELAC (Community of Latin American and Caribbean States) throughout the document.

² European Commission (2016): European Charter for Access to Research Infrastructures Principles and Guidelines for Access and Related Services

- conduct an analysis of the respective regional RI landscape to identify potential opportunities for cooperation;
- explore and propose concrete measures to support transnational and bi-regional access to RIs;
- promote cooperation between pan-European RI and their counterparts in LAC – verifying the opportunity for exchange visits and possible short to medium term RI staff exchange programmes;

The process of the Senior Officials' Meeting Research Infrastructure working group (RI WG) was initiated in 2016 with an awareness raising workshop on RI collaboration for the LAC ambassadors in Brussels. Afterwards all LAC countries were asked to nominate representatives for this topic and finally in March 2017 the RI WG was endorsed. The first meeting in Montevideo on September 28-29th 2017 was targeted at LAC to create a space for a regional coordination between the member countries.

The meeting's objectives were to

- present the national RI capacities of the participating LAC countries;
- make use of existing capacities and establish a basis for developing a regional roadmap;
- identify common topics of the region by also acknowledging the heterogeneities of the countries and recognizing specific priority topics of sub-regions;
- create synergies with ongoing initiatives.

To prepare the meeting, a survey was conducted among all LAC representatives nominated for the RI WG with the objective to create an overview on the national RI landscapes. The survey was focused on RI that are (planned to be) open for users from other countries or already have collaboration agreements. It laid a foundation for the discussions at the workshop. Afterwards a second survey was initiated, adjusted according to the outcomes and agreements made in Montevideo. Some countries used that opportunity to specify more in detail the access conditions and collaboration agreements in place, others added additional RIs that might be of special interest. This document summarizes the outcomes of both surveys and the information and data presented by the country representatives in Montevideo, Uruguay.

This report is a product of EULAC Focus, a research project funded by the European Commission under H2020 for the period 2016-2019. The project was approached by the European Commission DG RTD with the request to support the bi-regional political dialogue on the topic of RIs by preparing a first overview on existing capacities of RI in LAC that are open for international collaboration. Thus, the Work Package (WP) leader of the scientific dimension, DLR, conducted two surveys under the LAC countries participating in this process in close collaboration with the co-leaders of the RI WG. These surveys provided the basis for developing a LAC regional approach. The information on RIs in LAC gained through the surveys was combined with the results of the activities of the RI WG and desk research conducted by DLR. The European side was covered by making use of the information provided by the European Strategy Forum on Research Infrastructures (ESFRI).

The aim of EULAC Focus is to promote the EU-LAC Strategic Partnership by reinvigorating and strengthening existing initiatives and proposing new and innovative areas of cooperation between both regions in the cultural, scientific and social dimensions. This is undertaken through a series of

research actions, focused on those three spheres in order to support the development of policy recommendations for the future relations between the EU and LAC regions.

2 EUROPEAN PERSPECTIVE ON RIs

Parting from the idea of a bi-regional cooperation, the European side is represented by the **European Strategy Forum on Research Infrastructures (ESFRI)** serving as a strategic interlocutor. In 2002, ESFRI was established on a recommendation from the EU Council as a discussion body for issues that were raised by national delegations with regard to RIs. It consists of senior-political officials from European member states and associated states nominated by the respective research ministers as well as a European Commission delegate. ESFRI is the main forum at a regional level in policymaking in this area. Among others, it serves for exchanging experience and staying informed about national and international initiatives. A major task is to contribute in the development of a strategic roadmap for new RI for the next 10-20 years. National authorities have the possibility to negotiate and decide on their participation in specific projects according to their national priorities and needs (ESFRI 2015).

In the frame of ESFRI, an analysis among the promoted projects has been undertaken by the European Commission in order to find out with which countries outside the European Union there is already collaboration underway. With regard to LAC, the analysis showed that only Brazil and Mexico have institutionalized partnerships. But when coming to other forms of collaboration such as Memorandums of Understanding, working arrangements at a research institute level or technical assistance, Argentina, Chile and Uruguay are already related to EU RIs (Strategy Report on Research Infrastructures. Roadmap 2018, ESFRI).

To foster collaboration between Europe and other regions and countries, the ESFRI serves as a strategic incubator.

Another forum to strengthen international cooperation between RIs, the **Group of Senior Officials on Global Research Infrastructures (GSO)**, was established in 2008 at the first meeting of G7 research ministers in Okinawa. The GSO consists not only of the G7 countries but also of Australia, **Brazil**, China, India, **Mexico**, South Africa, and Russia as an observer. The mandate of GSO is to provide a non-binding, open forum for policy exchange on global RIs and international cooperation, exchange information on existing and planned new RIs, and to create standards for the development of new partnerships and collaboration, such as: transnational access, data management, evaluations. The GSO Group also has a number of states whose RIs quality standards deviate from the standards of the G7 states achieved so far. To this end, the GSO has agreed on a catalogue of criteria, the so-called "framework", which represents a first step towards a common understanding of quality standards for global RIs.

The national research institutions benefit from the work of the GSO, as more and more international cooperation in the area of RIs is emerging. The national user communities benefit from the opening up of the RIs in the GSO partner countries, and national RIs of potential global relevance gain new international partner countries, which, for example, co-finance the operation.

Another information source for the present analysis on the LAC landscape of RIs is the list of international cooperation registered by the **Research Infrastructures Consortium for Horizon 2020 (RICH)** in a RIs Observatory. This European initiative aims to facilitate trans-national cooperation between National Contact Points (NCPs) for RIs with a view to identifying and sharing good practice

and raising the general standard of support to programme applicants. The RI Observatory was initiated under the **EuroRIs-Net+ Project** and is the single entry point for information on RIs. It has been further developed and is currently supported by H2020-RICH 646713.

The NCPs for H2020-RI programmes gather, organise and provide access to information on RI projects, transnational access opportunities, policy issues, stakeholders, national and regional initiatives on RIs and others. Researchers, policy makers and NCPs of other H2020 programmes can stay up to date with latest development on RIs, search information based on their own interests, discover snapshot-reports, explore RIs per country or thematic field, investigate collaboration networks and map projects and policies across Europe.

Two LAC RIs are listed in the RI Observatory (with reference to MERIL, see below):

- The Argentine Pierre Auger Cosmic Ray Observatory, (<https://portal.meril.eu/meril/view/facilitys/15681>)
- The European Organisation for Astronomical Research in the Southern Hemisphere (European Southern Observatory - ESO) in Chile, <https://portal.meril.eu/meril/view/facilitys/15602>

For more information on the RICH RI Observatory please check: <http://observatory.rich2020.eu/rich/>.

Some of the RIs from the LAC countries are also listed in **MERIL (Mapping of the European Research Infrastructure Landscape)**, a portal that provides access to a database storing information about openly accessible RIs in Europe (and beyond), across all scientific domains, including the social sciences and humanities. The MERIL public portal is an open access resource displaying available information that has been collected with input from EU Member States and Associated Countries, and the RI scientific community. The information is quality-checked by the MERIL team.

Currently MERIL has about 900 identified RIs, and about 600 of them have completed profile pages and are visible on the public portal. MERIL interacts with a broad community of stakeholders, which includes the RI scientific community, the European Commission, ESFRI, and other RI-related initiatives and projects.

3 LAC PERSPECTIVE ON RIs

In 2009, the **Organisation of the Ibero-American States for Education, Science and Culture** (Organización de Estados Iberoamericanos para la Educación, la Ciencia y la Cultura, OEI), produced an **inventory and an analysis of large scale scientific facilities** (“Grandes instalaciones científicas en Iberoamérica”) including astrophysical observatories, research vessels as well as research bases in the Antarctic and in 15 countries in the LAC region. The term “large scale facilities” is based on the following definition: “unique or exceptional facilities whose investment and / or maintenance cost is relatively large in relation to (other) Research and Development (R&D) investments in the area where their activity is conducted, and whose importance and strategic nature in R&D justifies their accessibility to all the R&D community and society as a whole”. Following this definition, many of those large scale facilities listed in the report can be classified as RI. Thus, this report is the first comprehensive compilation of LAC RIs and is an important reference document.

In the last 10-15 years the LAC countries have increased investment in their scientific community and have elevated the number of scientists and RIs. This translates into a wider research facilities landscape and maturity of policies that regulate their governance, access and international cooperation. There has been special progress in Brazil, Mexico, Chile and Argentina that have been leading in several parameters of science in LAC. However, in most other countries (e.g. Guatemala, Bolivia, El Salvador, Honduras, etc.), public efforts are minor and mainly focused on creating links between the different stakeholders in nascent research and innovation ecosystems. That leads to a more or less clear definition of a RI in general and how the cooperation with other RIs can be organized.

The activities of the EU-LAC Working Group on Research Infrastructures (RI WG), mentioned before in Chapter 1, are currently being supported financially and accompanied on an operational and analytical level by the European Commission, through a specific contract implementing the Framework Service Contract “**Service Facility in support of the Strategic Development of International Cooperation in Research and Innovation**”. Through the specific contract a series of meetings, policy workshops and study visits to RIs in LAC and the EU have been organized. The interrelation between the discussions taking place in the RI WG, the policy workshops, and among the participants during the study visits provide the major added value of this bi-regional cooperation. The overall objectives are to contribute to the EU-LAC Common Research Area, to build bridges between the different RI stakeholders and guarantee the interlinkages of the discussion forums by exchanging views and create communities of practice between national authorities, RI managers and the researchers/users of the instruments in both regions.

During a meeting of the RI WG in Brussels in March 2018 the national delegates were asked to identify their key national RI open to international access that would be interested to host study visits. Based on this list, the national delegates from EU and LAC had then the possibility to select five EU and LAC RIs priorities which they would be interested in visiting.

The results of this selection processes were discussed at a follow-up meeting of the RI WG in September 2018 in Vienna. The delegates decided on having five study visits to European and five study visits to LAC RIs. Based on the ranking according to the number of votes and additional combinations, the final selection was discussed in coordination with the EC, the respective national

delegates and the RI managers. The majority of the mentioned study visits have already been conducted. The involved RIs are included in this report.

Currently, the LAC-delegates of the RI WG are carrying out a new extensive survey on RIs in the region. The idea is to get a more comprehensive and differentiated picture of the RI landscape and to be able to relate thematic areas to prioritized RIs. In the survey the RIs will be categorized by questions related to the type of RI: single sited, multi sited or virtual; funding sources of the RI (public and/or private; from a ministry or funding institution); services offered by the RI; life cycle of the RI; the thematic areas; special policies for transnational access existing or not; collaboration types of the RI (national, regional, international); types of user groups; user capacity; number of employees; cost structure. The results of this survey will lead to the production of a national mapping on RIs in each of the approx. 12 LAC-members of the RI WG, which are expected to be finalized by the end of 2019.

Other examples like the new initiative for a **Latin American Strategy Forum for Research Infrastructure (LASF4RI)** show how the LAC region is pushing forward with international cooperation in the RI area. The main purpose of the current initiative is to start a dialogue for establishing a joint vision for the scientific development of Latin America in Particle Physics and Cosmology. Experiments such as the Deep Underground Neutrino Experiment (DUNE) in the USA will count with substantial international support and there is already a community in more than 10 LAC countries willing to be actively involved (some are already participating). CERN, the European Organization for Nuclear Research, is very interested to strengthen the already strong links with LAC scientists and build up from the experience of the High Energy Latin American European Network (HELEN) and the European Particle Physics Latin America NETWORK (ePlanet) projects.

Additionally, the planned underground laboratory ANDES in the approved Agua Negra tunnel that will link Chile and Argentina offers a unique opportunity to become a regional project from the start. A coordinated use of the new light-source facility in Campinas, Brazil offers a special opportunity for scientists in fields as diverse as biology and material sciences. A potential opportunity to create the first gravitational waves detector of the southern hemisphere would be a long term project building on the recent discovery of gravitational waves that has innumerable possibilities for future research. For further information on the LASF4RI initiative please check: <https://www.ictp-saifr.org/workshop-on-the-latin-american-strategy-forum-for-research-infrastructure/>.

4 OBJECTIVES AND METHODOLOGY

The objective of this document is to draw a picture of the current RI landscape in LAC countries regarding their collaboration potential and to identify regional cases that could serve as pilots for initiating a stronger LAC collaboration on RI.

In order to achieve that a two-step survey was conducted, addressing all LAC representatives of the RI WG. The results of the empiric part were complemented with data from previous initiatives and current activities of the RI WG.

Empiric studies

The empiric part of this document is based on the following types of information: The first and the second survey filled out by the national country representatives and the presentations prepared for the Montevideo meeting.

The 1st survey round sent out to all designated representatives of the RI WG (as to the position from 04th September 2017 20 countries nominated representatives).

The recipients were asked to identify three categories of RIs in their country

Category 1: National Research Infrastructures that are already open to other LAC country users

This category is targeting at RIs that offers access to national and international researchers, mostly focusing on the intraregional cooperation in LAC. The national representatives were asked to give a brief overview on the access conditions for other research teams.

Category 2: Existing RIs that are ready to be open for possible institutional collaboration with other RI in LAC countries

To identify RIs of regional interest, categories 2 and 3 addressed RIs that are considered of regional interest based on their planned or already existing institutional collaboration with other LAC or international facilities. Therefore, the recipients were asked to briefly describe the objectives of the envisaged collaboration.

Category 3: RIs that already have in place an institutional collaboration with other RI in LAC countries

In line with category 2, this category also addresses RIs that have established collaborations with LAC and other countries. The recipients were asked to briefly describe the existing partnership.

The first round of the survey was open from 07th August to 15th September 2017. A total of 20 countries were addressed and 14 respondents replied to the survey.

The country presentations were diverse in its content. Most of them were introducing the general STI system before explaining more on the programmes and individual RIs in their countries.

The results of the first round survey were presented and discussed at the meeting of the LAC representatives of the RI WG in Montevideo (September 28-29th 2017).

The **second round** of the survey was adopted according to the discussions and results achieved at the Montevideo workshop. The objective was to receive more detailed information on the access conditions and policies and the already existing cooperation and to select only that are or have the potential to be opened for the use of actors from other LAC countries. As important for RI in LAC countries, the areas of Health, Food, Energy and Climate change were identified. Nevertheless, RI from other areas could also be nominated in case there are of interest for promoting the collaboration. A total of 15 countries responded the survey (as of 26 December 2017).

Complementary data

The results of the surveys were complemented with selected data from previous inventories, which were reviewed and where necessary updated, such as: OEI report “Grandes Instalaciones Científicas en Iberoamérica” from 2009, RIS+ Net Survey from 2013, the “Consultation on International Outreach of ESFRI projects and landmarks. Main findings.” realized by the European Commission in 2016 and the results of the RICH 2020 RIs Observatory.

In addition, the report also reflects current activities of the EU-LAC RI WG which is aiming at producing systematically aligned national mappings of RIs in LAC.

General remarks

A major challenge in developing a regional approach and the selection of regional cases was the inclusion of countries with less experience in international cooperation. To create a structured dialogue and initiate intraregional collaboration among LAC countries, the differences in their starting conditions were considered. Most of the countries have facilities at their disposal but often without any central systematic record of access conditions. However, making this information available is important and might facilitate the opening to foreign researchers. Furthermore, making use of national RI with already established institutional agreements with RI from other LAC countries might serve as example on how to promote transnational access.

5 SURVEY RESULTS

The received data by the countries show a broad variety of different information and understanding of RIs. This outcome reflects the large variety among the LAC states regarding their RI landscape. While some countries started to systematically follow-up their RI facilities and capabilities, for others there is no centralized information about the access conditions and institutional collaborations.

The first part of the results analysis draws a general picture of the information received, the second part explains the differences in the received RIs in more detail and the third part briefly summarises the individual country results and observations.

5.1 GENERAL DESCRIPTION

The table below displays the countries that participated in this multi-stage process.

Table 1: Countries participating in the multi-stage survey process on LAC RIs

	Country	Survey round 1	Country presentation at RI WG meeting in Montevideo (Sept 2017)	Survey round 2
1.	Argentina	X	X	X
2.	Barbados	X	X	
3.	Bolivia	X	X	X
4.	Brazil	X		X
5.	Chile	X	X	X
6.	Colombia		X	
7.	Costa Rica			X
8.	Cuba	X	X	X
9.	Dominican Republic		X	
10.	Ecuador	X		X
11.	El Salvador	X	X	X
12.	Guatemala		X	
13.	Honduras	X	X	X
14.	Mexico	X		X
15.	Nicaragua	X	X	X
16.	Panama	X	X	X
17.	Paraguay	X		X
18.	Peru		X	X
19.	Uruguay	X		X
20.	Venezuela		X	X
	TOTAL	14	15	16

5.2 CATEGORIES

Since the term “Research Infrastructure” was not specified any further by the participants involved in this process, the variety of RIs identified by the different LAC countries is very broad. The major differences in the RIs are divided in the following categories:

5.2.1 Type of Research Infrastructure

The type of RI considered for this task varies among the member countries. Some countries refer only to single-sited technological equipment, others include national research centres that promote science and technology development in different scientific domains and some countries refer to national programmes fostering the networking and the improvement in the efficient use of national RIs. Some countries also included research teams.

The EU definition of the concept of RIs is broadly formulated. It addresses two characteristics – type and location:

1. Type: RIs might be facilities, resources and services that serve the scientific community to do research and promote innovation.
2. Location: They can be “single-sited (a single resource at a single location), distributed (a network of distributed resources), or virtual (the service is provided electronically)” (European Union 2013).

RIs covered by this definition are for example large-scale scientific facilities (e.g. research vessels, observatories), resources such as collections, archives, laboratories or scientific data and e-infrastructures such as data and computing systems, and communication networks.

There are three categories of RIs to describe the European landscape:

The first category refers to RIs that are organized as international organizations promoted by the EU members states.

The second category includes European RIs that are of high-added value for the European Research Area (ERA)³ and are included in the Roadmap of the European Strategic Forum on Research Infrastructure (ESFRI).

The third category refers to national RIs that are of European interest. These are RIs that are financed by member states or sub-regions and have been identified as relevant for the ERA. Therefore, the facilities receive support by the EU, mainly by financing activities to open up the facilities to European researchers from academia and industry.

5.2.2 Scale

Another issue that varies widely is the difference in the scale of the identified RIs. Countries such as Argentina, Brazil, Chile and Mexico concentrated on large-scale RIs, platforms and support programmes for opening their RIs whereas most of the other countries concentrated on medium-

³ The European Research Area was established under the treaty of Lisbon in 2000. It promotes a free circulation of researchers, knowledge and technology among the European member states (European Commission 2012).

scale and small-scale RI. An indicator for classifying the RI regarding this topic might be the construction and maintenance costs.

5.2.3 Access policies

In several cases, a general interest for opening research facilities is formulated without specifying the access policies and conditions. There might be two reasons for that. On the one hand, the access policies are not yet formulated by the research facilities. The other one might be that the entity responsible for filling out the survey does not have the information at its disposal.

From the European perspective, access refers to the legitimate and authorised physical, remote and virtual admission to, interactions with and use of RIs and to services offered by RIs to users. Different forms of access to RIs might be granted. One is to give researchers from other institutions and countries the possibility to use the facility to conduct research or carry out experimental developments being physically present or from a distance. Another form is to provide education and training. Furthermore, a variety of RIs offer services such as analysis, sample preparation, the set-up, execution and dismantling of experiments and technical support.

Another form to distinguish RIs is applying the three different types of access mode. Formulating RI's access policies, the modes can be used separately or applied in combinations.

Excellence-driven access

The selection of users that are granted access to RIs is solely based on the criterion of scientific excellence, quality and originality of the research proposal and technical and ethical feasibility, assessed by internal or external peer experts. That mode fosters the collaboration of excellent researchers worldwide and across thematic disciplines.

Market-driven access

The market-driven access mode is based on a formal accordance between the user and the RI, agreeing on the conditions to access the facility and remunerated by the user.

Wide access

This approach promotes the most extensive possible access to the produced data and digital services that are offered by the RI. The RI increases the visibility of its activities and services without border limitations.

5.3 COUNTRY SUMMARIES

In the following, the information sent by every country in the survey process described above is briefly analysed according to the types and areas of identified RI as well as their information regarding the access conditions and potential and/or already existing institutional collaborations.

Since the LAC-region is still in the process of specifying a common definition of what a Research Infrastructure is, the lists of RIs presented by each country in the surveys were respected, although the selection criteria might not have been in line with the European RI definition. Therefore, the

country summaries of this report represent a picture of the **current landscape of active RIs** in LAC, combining RIs listed by European and LAC-institutions.

Complementary information on RIs in the respective country identified by other initiatives / projects (see chapter 4) – if available - is shown below each table describing the country results of the survey process.

5.3.1 Argentina

Survey results

Key facts	<p>Argentina divides its national systems into three categories:</p> <ol style="list-style-type: none"> 1. Large Instruments National Systems: Microscopy, Magnetic Resonance, HPC, Mass Spectrometry, X-rays, Lasers, Magnetometry, Flow Cytometry (457 instruments) 2. Database National Systems: Biological, Sea, Climatic, Genotic Data and Digital repositories (368 Databases) 3. National Systems of Technology Platforms: Vivarium, Micro and Nano Manufacturing, Genomics, Troteomics, Phenomics, Biobanks (61 Platforms) <p>For the complete list please contact the author.</p> <p>In this process, Argentina selected some RIs and supporting programmes and mechanisms that might be of special relevance for enhancing the LAC cooperation on RI.</p> <p>Two programmes that enable and promote the transnational access to Argentinean RIs are the following:</p> <p>National large equipment systems</p> <p>Argentina created a central entry point to national laboratories and research centres for national and international researchers. The objective is to promote an efficient use of large research instruments and provide a better access to scientific databases based in different science and technology institutions. The programme involves 10 national systems of large instruments and 5 national databases. It works on the conditions of a shift system without any discrimination of country the researcher's is applying from. But to make use of the facility, the researcher must be in Argentina. It furthermore includes a mapping of the existing capacities including relevant information and contact details.</p> <p>Programme of Large Equipment for Astronomy (e.g. LLAMA, ABRAS)</p> <p>This programme provides high-resolution Science and Technology equipment for astronomy. Researchers can apply for access through the working groups in charge of the respective technologies.</p> <p>National data systems for the areas of sea, biology and genomics with the objective to</p>
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establish collaborations through the share and use of digital data repositories

Pampa Azul programme (PA)

PA addresses marine infrastructure with the objective to collaborate in the development of research technologies and renewable sea energies.

Federal Network LA Referencia

Together with seven other LAC partner countries, Argentina is connected to the Federal Network Referencia which has the objective to open up the access to digital repositories from across Ibero-America. The institutional collaboration and the access possibilities are secured through Red Clara.

Observations

- Argentina has well established mechanisms and programmes to foster the networking between national and international RIs, especially regarding large-scale facilities. The existence of a coordinated national programme for Large-Scale Instruments and Databases might simplify the up-scaling and collaboration with other countries immensely.
- Argentina established a single-entry point for national laboratories and research centres based on a shift system and a facility management system with data on the use of the RI by foreign research teams open accessible
- Argentinean RI are connected to LAC/ international RI consortia e.g. through the following projects:
 - Biotechsurg (with Spain and Mercosur)
 - Ibero-American program of science and technology for development (CYTED)
 - EMBL (with European countries)
 - Virtual centres (with Brazil, Cuba and Mexico)

Complementary Data

RIs mapped in the OEI-report “Grandes Instalaciones Científicas en Iberoamérica” (2009) and the EuroRIs-Net+ Report (2013):

- **Instituto Antártico Argentino:** The Argentine Antarctic Institute was created in 1951. In the origins of this creation, there was a recognised need for the existence of a specialized agency permanently, east, which supervises and runs the research and studies of technical-scientific nature concerning this region, in coordination with the National Commission then Antarctic, under the Ministry of Foreign Affairs. All bases (13) are located within the so-called Argentine Antarctic Sector. Six bases are permanent: Marambio, Belgrano II, Esperanza, Carlini, Orcadas, San Marín and seven bases are temporary: Brown, Cámara, Decepción, Matienzo, Melchior, Petrel, Primavera. They were located mainly following a policy of territorial occupation to strengthen sovereignty in the region. The bases Esperanza, San Martín and Belgrano II, in addition to the previous point, were installed with the intention of using them as logistical points to reach the South Pole. The main task is related to scientific research, while secondary tasks are logistical and technical maintenance of facilities and

infrastructure, support services to expeditions of other bases, ships, and aircraft, as well as maintenance of shelters.

- **Oceanographic vessels:**
 - The ARA Puerto Deseado is a reinforced hull research vessel, Argentinian design, equipped with laboratories for research campaigns in the Argentine Sea and Antarctic, belonging to the Navy.
 - The ARA Almirante Irizar is a large icebreaker of the Argentine Navy. The ship has been out of service since 2007, when a fire broke out in the auxiliary generator compartment. Beginning of 2017 the repairs were completed.
 - ARA Comodoro Rivadavia is a survey ship of the Argentine Navy assigned to the national Hydrographic Naval Service which is responsible for the maintenance of nautical charts, balises and lighthouses.
 - The ARA Austral (formerly RV Sonne) is a scientific research vessel operated by the Argentine Naval Hydrography Service. Of German origin, it belonged to RF Forschungsschiffahrt, Bremerhaven until 2014.

- **Atomic Center Bariloche (CAB):** Created in 1951, the Bariloche Atomic Center (CAB), an agency of the National Atomic Energy Commission, is one of the most prestigious venues of research and development in the physics and nuclear area. It is also recognized for its distinguished job in human resources training.

- **INVAP S.E.** is an Argentine high-technology company dedicated to the design, integration, construction and delivery of high complexity equipment: In projects for academic institutions such as the neutron beam research facility at OPAL, ANSTO in Australia. INVAP helps to provide facilities for scientific research. Other initiatives include designing world-leading facilities for bodies such as the Egyptian ETRR-2 reactor for the Atomic Energy Authority and RA-6 reactor for Instituto Balseiro in Argentina.

- **INVAP and the aerospace technology:** With three satellites of its own design and construction already in orbit, INVAP has won a privileged position in the international satellite technology scene. INVAP is currently the only Latin American company capable of implementing full satellite projects: from the mission concept to the placement in orbit and complete operation of the satellite, except it's launching.

- **Comisión Nacional de Actividades Espaciales (CONAE)** is the national space agency of Argentina and has a mandate to design, manage and execute space-related projects and activities for peaceful purposes, under the scope of the Ministry of Foreign Affairs. Argentina's Space Program includes three satellite series: SAC, SAOCOM and SARE. Since its creation CONAE has placed in orbit 4 satellites: SAC-B, SAC-A, SAC-C and SAC-D/Aquarius.

RI mapped in MERIL (Mapping of the European Research Infrastructure Landscape):

- **The Pierre Auger Cosmic Ray Observatory** is studying ultra-high energy cosmic rays, the most energetic and rarest of particles in the universe. The Observatory was constructed and is operated by an international collaboration of about 90 institutions in 18 countries.

Funding is provided by scientific funding agencies in each of the participating countries. The Auger Observatory in the Province of Mendoza, Argentina, has been taking data since 2004, adding detectors as they became active until completion in 2008. <http://www.auger.org/>

RI's included in the EU-LAC-RI working group process:

- **The National Patagonian Center (CENPAT)** is a multidisciplinary center for scientific and technological research, dependent on CONICET: Centro Científico Tecnológico (CCT CONICET – CENPAT), Puerto Madryn, Province of Chubut. The range of scientific research carried out today at the Center covers the biology and management of aquatic and terrestrial resources, oceanography and meteorology, social sciences, geology, paleontology, and studies on diversity, systematics and evolution. This variety of topics has accompanied the accelerated process of social and economic growth in Patagonia, based in particular on the use of its natural resources, the axis of most of CENPAT's research.
- **The Scientific-Technological Centre (CCT) CONICET Bahía Blanca** brings together twelve research institutes identified as executing units and a territorial administration unit consisting of centralized service laboratories with large equipment such as scanning and transmission electron microscope, X-ray diffractometer, X-ray fluorescence spectrometer, absorption spectrophotometer, atomic and conventional X-ray equipment for the study of microbial plants in marine soils, all of them aimed at meeting the needs of the different research groups and the transfer of technology to the production sector.
- **Centro de Medicina Comparada de Santa Fe (CMC)** belongs to the Universidad Nacional del Litoral, UNL, and has an integral approach of investigations carried out with laboratory animals under international standards of ethics and quality in its use and care. It has a total surface of approximately 520 m² with areas destined to the production of different species, biological tests, quality management and administrative dependencies and 300 m² of high complexity laboratories associated with the Center.

5.3.2 Barbados

Survey results

Key facts

Barbados identified a total of five RIs that are open to be accessed by foreign researchers without further specifying the access conditions or established partnerships in the survey.

Two RIs are from the field of agriculture (The **Caribbean Agriculture Research and Development Institute** and the **Agronomy Research Variety Testing Unit**), one in the field of meteorology (**Caribbean Institute for Meteorology and Hydrology**), one in Health (**Chronic Disease Research Center**) and one cross-cutting RI which is the **Faculty of Science and Technology**.

All RI were classified as laboratories except of the **Chronic Disease Research Center**. Further information on the potential and the interest of collaboration with other LAC

	facilities is not available.
Observations	- Information on international access policies and interest are not available.

5.3.3 Bolivia

Survey results

Key facts	<p>Bolivia identified four RIs that are already open for LAC users:</p> <p>Instituto de Servicio de Laboratorios de Diagnóstico e Investigación en Salud and Laboratorio de Histocompatibilidad e Inmunogenética (LHIG) -Universidad Mayor de San Andres (UMSA), Institutos SELADIS</p> <p>Through inter-institutional cooperation agreements of the UMSA, strategic alliances can be created for the development of research processes. In general, the SELADIS Institute participates in cooperation agreements, providing as contribution its infrastructure, equipment and research personnel for the development of research projects or social interaction.</p> <p>Instituto de Investigaciones Farmaco Bioquímicas, Facultad de Ciencias Farmaceuticas y Bioquímicas, Universidad Mayor de San Andres (IIFB)</p> <p>Collaboration with the Faculty of Medicine of the Universidad Mayor de San Andres and interaction with the Unit of Endocrinology and Internal Medicine of the General Hospital of Clinics in La Paz. Collaboration with the Department of Molecular Medicine and Surgery (MMK) of the Karolinska Institute in Stockholm, Sweden. Support from the "Spanish Agency for International Development Cooperation (AECID), for research in diabetes, obesity and inflammation.</p> <p>Immunoparasitology Unit, Department of Pathology, Faculty of Medicine, Universidad Mayor de San Andres (IMMPARU)</p> <p>Collaboration with the Child Hospital "Dr. Ovidio Aliaga Uria" in La Paz city, Caranavi Municipal Hospital in Nord Yungas and Chulumani Health Center in South Yungas of La Paz department. Collaboration with the Department of Microbiology, Tumor and Cell Biology (MTC) of Karolinska Institute in Stockholm, Sweden and the division of Nuclear Medicine, Turin University, Turin, Italy.</p> <p>Besides, Bolivia identified RI that are ready to open for institutional collaboration with other RI in LAC countries</p> <p>Centro de Biodiversidad y Genética (CBG)</p> <p>The CBG seeks to promote the conservation of Bolivia's natural heritage on a solid scientific basis based on quality research and socially responsible. Through the strengthening and improvement of the development of research capabilities to constitute a centre of excellence research and national reference in the subject of</p>
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Biodiversity, its threats and the sustainable conservation of this national heritage.

Herbario Nacional Forestal “Martín Cárdenas” (BOLV)

It has approximately 40,000 plant specimens, hosts a number of historical collections of wild potatoes, amaryllidaceae and trees from Bolivia and collections of the inter-Andean valleys of Cochabamba and other parts of Bolivia.

Laboratorio de Zoología

It has temporary collections of different protected and unprotected areas and of different localities of the country. The objective of this laboratory is to support teachers, students of the Biology Degree and other institutions, in the identification of fauna. In addition, it houses more than 1500 specimens prepared in the scientific collection, among which are insects, rodents, bats, birds, amphibians and reptiles.

Laboratorio de Genética Molecular

The function of this laboratory is to support studies of animal and plant populations. It has the possibility to extract DNA from different samples (feathers, hairs, blood, tissue) and to work with some genetic markers, to establish the genotypic characterization at the individual level (microcentrifuge, thermocycler and electrophoresis).

Center of Biotechnology (CBT)

The CBT seeks to promote an adequate conservation of microbial biodiversity in Bolivia and to study its potential biotechnological applications based on research developed with safety, innovation, precision and responsibility. In addition to using biotechnological techniques in the transformation of natural resources of interest in the region.

Laboratory of studies in microbial diversity in extreme environments

The laboratory has a collection of almost 60 extremity bacteria of which 10 are properly identified. It aims to study the microbial biodiversity of different extreme environments of Bolivia to later know the main biotechnological applications of the microorganisms present in these niches. Among the main applications studied we can name: the production of biodegradable plastics, bio-transformation of organic compounds in products with higher added value, production of enzymes.

Laboratory of enzymatic technology

This laboratory aims to search for different enzymes of industrial interest (lipases, xylanases, proteases, etc.) produced by extremophile microorganisms isolated from different environments of Bolivia. Thanks to these studies it has been possible to produce enzymes that have been used in liquid detergents and also in the leather treatment for enzymatic hair removal.

Laboratory of environmental biotechnology

The purpose of this laboratory is to use autochthonous microorganisms for the treatment of soils and/or waters contaminated with hydrocarbons, heavy metals and/or herbicides. Laboratory and pilot plant tests have been performed with degradation results that exceed 80%.

Laboratorio de Biocombustibles / Laboratory of Biofuels

The objective of this laboratory is to study the production of biofuels using isolated algae from the Andean region of Bolivia, and studies are currently underway to produce biodiesel using agro-industrial waste and non-edible oils.

Laboratorio de Ingeniería en Computación (L-IC)

The Computer Engineering Laboratory is dedicated to researching, designing, developing, testing and evaluating high performance hardware and software solutions, computer networks and general purpose embedded systems.

Facultad de Ciencias Puras y Naturales – UMSA

Relevant RI: Nuclear magnetic resonance; Food Field Fractionation; Atomic Absorption and Atomic Absorption with graphite furnace; Ion chromatograph; Mercury analyser equipment; HPLC - High Pressure Liquid Chromatography; Gas Chromatograph; Minor equipment for water field analysis.

Laboratories for: Trace analysis of heavy metals and mercury where there is no contamination, completely adequate according to international standards, with gas bells; analysis of natural products; food analysis; energies.

Observations

- The Bolivian universities manage their own funds and thus decision on international collaboration might not be taken at national level.

5.3.4 Brazil

Survey results

Key facts

Brazil identified RIs from various fields.

A total of six RIs from different areas are listed that are already open to other LAC institutions, mostly through training programs for researchers (Masters and PhDs), summer schools, exchange programmes, postdoc and postgraduate programmes. That gives an indication that Brazil is making use of the mobility of the human resources to connect with other facilities. The institutes are the following:

Instituto de Matemática Pura e Aplicada (IMPA)

Instituto Nacional de Investigaciones de la Amazonia (INPA)

Centro de Desarrollo de Tecnología Nuclear (CDTN)

Instituto de Ingeniería Nuclear (IEN)**Instituto de Investigaciones Energéticas y Nucleares (IPEN)****Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA)**

Several RIs were identified as ready to be open for possible institutional collaboration. The objectives for collaboration and access conditions are not specified in detail. The RI are the following:

The other RIs mentioned, such as the Emilio Goeldi Museum (MPEG), the National Scientific Computation Laboratory (LNCC) and the National Observatory (ON) are mostly collaborating through trainings and programs for under graduation, graduated and postgraduate students.

The Mamirauá Institute (IDSM) for sustainable development created and implemented an Institutional Research Plan which included the expansion of RIs among others. The institute develops projects that bring together research, management and social development and is generally funded by companies, governments or foreign institutions.

The Institute of Technological research (IPT) is attentive to the needs of the public and private sectors and provides technological solutions and services aimed at increasing the competitiveness of companies and promoting quality of life. Through twelve technology centres, it acts in a multidisciplinary way, contemplating the most diverse segments such as energy, transport, oil and gas, environment, civil construction, cities, health and safety.

Besides, there are additional institutions working on specific thematic areas such as the Mineral Technology Center (CETEM), which focuses on the technology innovation in the mining sector; the National Center for Research in Energy and Materials (CNPEM); the Institute of Food Technology (ITAL) focusing on the areas of packaging and processing, conservation and food and beverage safety; the Butantan Institute focusing on health and immunobiological production.

The identified RIs for Brazil are mostly linked to the Federal Government and in particular to the Ministry for Science, Technology, Innovation and Communication (MCTI). The respondent emphasizes that there are further RIs and laboratories on national and state level that are connected to other Ministries, Universities and state entities.

Connected to the Ministry of Health is the Oswaldo Cruz foundation (FIOCRUZ) in the area of health. The association predominantly include institutions from African countries that have Portuguese as their official language (Angola, Cape Verde, Guinea Bissau, Mozambique and São Tomé Príncipe), countries of the Union of South American Nations (Unasur) and other Latin American countries (Argentina, Bolivia, Chile, Colombia, Costa Rica, Cuba, Ecuador, El Salvador, Guyana, Haiti, Mexico, Paraguay, Peru, Suriname, Uruguay and Venezuela). In this area, the establishment of networks of structuring institutions was promoted, which are sharing Fiocruz as secretariat. The networks include the Network of National Institutes of Health (Rins),

Observations	<p>Network of National Public Health Schools (Resp), Network of Technical Health Schools (Rets), Pan-Amazon Network of Science and Technology. In addition to these, the Human Milk Bank Network (rBLH) is widely developed.</p> <p>Brazil has a well-established RI landscape, collaborating with actors from different countries on different levels. The collaboration with other LAC facilities in some of the identified RI has yet to be clarified. FIOCRUZ might be considered as a very relevant and well established RI for further expansion.</p>
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Complementary data

Oceanographic vessels (*desk research*):

- **Alpha Crucis** is the most recent oceanographic research vessel in Brazil, replacing the older Wladimir Besnard research vessel. It is named after the Alpha Crucis star system that represents São Paulo state in the Brazilian flag. It is 64 meters long and 11 meters wide and has capacity for 25 researchers and is capable of remaining 40 days without being resupplied.

RIIs included in OEI-report “Grandes Instalaciones Cientificas en Iberoamérica” (2009) and the EuroRIIs-Net+ Report (2013):

- Brazil maintains a permanently staffed research facility, the **Comandante Ferraz Brazilian Antarctic Base**, located in Admiralty Bay, King George Island, near the tip of the Antarctic Peninsula. The peninsula is the northernmost, most accessible, and warmest part of the Antarctic continent and a number of countries, therefore, have research bases located on it.

RIIs included in the EU-LAC-RI working group process:

- The **Brazilian Center for Research in Energy and Materials (CNPEM)**, a complex of national laboratories, including the Brazilian Synchrotron Light Laboratory (LNLS) and Sirius Project, Brazilian Nanotechnology National Laboratory (LNNano), Brazilian Biosciences National Laboratory (LNBio) and Brazilian Bioethanol Science and Technology Laboratory (CTBE) for example have open facilities and structures dedicated to the programming of test that offer sophisticated infrastructure to academic and industrial researchers from Brazil and other countries.
- The **National Institute for Space Research** (Instituto Nacional de Pesquisas Espaciais, INPE) is a research unit of the Brazilian Ministry of Science, Technology and Innovation, whose main goals are fostering scientific research and technological applications and qualifying personnel in the fields of space and atmospheric sciences, space engineering, and space technology. While INPE is the civilian research center for aerospace activities, the Brazilian Air Force's General Command for Aerospace Technology is the military arm. INPE is located in the city of São José dos Campos, São Paulo.
- **Brazilian Agricultural Research Corporation (EMBRAPA)** is a state-owned research corporation affiliated with the Brazilian Ministry of Agriculture, Livestock, and Food Supply.

Since its foundation in 1973 it has been devoted to developing technologies, knowledge and technical-scientific information aimed at Brazilian agriculture, including livestock.

5.3.5 Chile

Survey results

Key facts	<p>Chile identified three RIs that already provide foreign researchers the opportunity to access the facilities and besides funding and promotion programmes for make better use of the existing RI capacities:</p> <p>Advanced Microscopy Center</p> <p>The Advanced Microscopy Center offers the possibility to book the equipment and make contacts through its web page.</p> <p>National Laboratory for High Performance Computing</p> <p>The access conditions to the National Laboratory for High Performance Computing are not that institutionalized. Interested researchers must contact the institution directly in order to get their case evaluated.</p> <p>Chile also identified RIs that are ready to be open for possible institutional collaboration with other RI in LAC countries and promote the process.</p> <p>National Antarctic Institute (INACH)</p> <p>INACH is a Research Institute responsible to coordinate the Antarctic's investigation. Logistic support is one of their main concerns. There are two ways for national and international researchers to access to INACH support: Through collaboration agreements with other Antarctic programmes or through professional relationships without formal agreements.</p> <p>FONDEQUIP</p> <p>The promotion of the opening up of medium-scale RI in Chile is fostered by the national funding programme FONDEQUIP. It was established in 2012 as a funding programme with a yearly budget of 9.000.000 US \$ that finances universities to acquire scientific and technological equipment without any thematic restrictions. FONDEQUIP finances equipment which costs over 80.000 US \$ and its supports it with a limit of 350.000 US \$. A co-financing of at least 50% must be secured by the facilities. Besides, the programme expanded its activities to promote the efficient use and facilitate the access of the existing facilities by establishing contacts between the projects and international researchers. The promotion of collaboration is one of the objectives of this programme and might serve as accelerator establishing collaborations and networks between LAC facilities.</p> <p>International Antarctic Center (CAI)</p>
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Observations	<p>The International Antarctic Center is currently under construction. The purpose of CAI is to generate a leading infrastructure that enables the development of Antarctic science of excellence and that serve as logistical support for the realization of expeditions to the white continent. It is planned to be operational in 2022.</p> <p>FONDEQUIP developed mapping of the existing RI capacities including the contact details to facilitate the overview and access to the facilities.</p>
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Complementary data

RI mapped in the OEI-report “Grandes Instalaciones Científicas en Iberoamérica” (2009) and the EuroRIs-Net+ Report (2013) - updated through desk research:

- **Antarctic bases:** There are four Chilean permanent bases operating through the year, while there are five that remain open only during the summer (December – March) (Seasonal) with four shelters: Base Presidente Eduardo Frei Montalva, Base General Bernardo O'Higgins Riquelme, Base Capitán Arturo Prat, Base Professor Julio Escudero, Estación Polar Científica Conjunta "Glaciar Unión", Base Yelcho, Base Doctor Guillermo Mann, Base Presidente Gabriel Gonzalez Videla, Base Carvajal.
- The largest population center is located in King George Island and is formed by the **Base Presidente Eduardo Frei Montalva** (1980), which has an airstrip, the **Meteorological Center President Frei** (1969) and the Villa Las Estrellas. Belonging to Chile, this enclave is the nucleus of more important logistical support to the remaining countries with scientific bases on King George Island.
- The **Chilean Antarctic Institute (INACH)** under the Ministry of Foreign Affairs opened on the same island Base Professor Julio Escudero, chief scientific center of Chile in Antarctica.

RI mapped in MERIL (Mapping of the European Research Infrastructure Landscape):

- The **European Organisation for Astronomical Research in the Southern Hemisphere (European Southern Observatory) (ESO)** is an intergovernmental organisation, currently supported by 14 European countries (Brazil is in the process of joining) and operating a distributed RI (La Silla/Paranal Observatory) with three observing sites (Cerro La Silla, Cerro Paranal, and Llano de Chajnantor) in Chile.

ESO is also the European partner of the project operating the world's largest array of submm/mm telescopes. ESO furthermore maintains offices and facilities in Santiago de Chile, La Serena, and Antofagasta, its international Headquarters, located in Garching near Munich, Germany. The Headquarters are an important center for R&D in astronomy related technologies and projects for large-scale observational facilities.

Application for observing time is subject to a general call for proposals each semester and allocation of time follows a peer-review process, based on excellence criterion. Applications

are normally submitted by groups of scientists, often with multi-national composition. For further information please check: <http://www.eso.org/public>

RIIs included in the EU-LAC-RI Working Group process

- **Research Station Patagonia UC (Pontificia Universidad Católica de Chile), Bahía Exploradores, Aysén Region:** The objectives of the Bahía Exploradores project are to establish a strategic site for the study of Global Change; promote a management model for the development of science, conservation and education, through its diffusion and sustainable tourism, developing a valorisation and management program that allows guiding public and private ventures in the Region of Aysén. The expected results are: to develop in the area, a model of use and interaction between different actors such as "University - State - Private", attracting educational, conservation and tourism projects, as well as basic science at a national and international level. The Research Station collaborates with the National Institute of Ecology and Environment (INEE, LabEx DRIIHM, CNRS France through the Interdisciplinary Observatory Network for the Interaction of Human and Environment) and the Institute of Geography at the University of Education in Heidelberg.
- **Coastal Station for Marine Research (Estación Costera de Investigaciones Marinas de la Pontificia Universidad Católica de Chile, ECIM):** The Coastal Marine research station offers scientific workshop facilities available for all UC researchers, Chilean researchers from other universities, as well as EU investigators. ECIM was one of seven marine research stations that formed ASSEMBLE Marine, a Framework 7 European Grant that provided access to those marine RIIs to all European Community investigators. ECIM was the only research station in the southern hemisphere. ECIM is part of WAMS (World Association of Marine Stations) and of the Chilean LTSER (Long-Term Socio-Ecological Research Sites) network. Recently ECIM laboratory was named a Centre for Environmental Education by the Chilean Ministry of Environment, thanks to its outreach program "Chile es Mar" (Chile's coastal ocean Program).
- **Center of Excellence for Geothermics of the Andes (The Centro de Excelencia en Geotermia de los Andes, CEGA)** is a Fondap-Conicyt project that began its operations during 2011. It is integrated by a team of researchers from the Faculty of Physical and Mathematical Sciences of the University of Chile, together with scientists from the Pontificia Catholic University of Chile and other international institutions. Its five main lines of research are: Sources of Heat; Geochemistry of Fluids and Isotopic; Heat-Fluid-Rock Interaction; Structural Geology, Tectonics and Geophysics; and Reservoir Modelling and Architecture.
- **Centre for Sustainable Urban Development (CEDEUS)**, a collaboration between the Pontificia Universidad Católica de Chile (UC) and the Universidad de Concepción (UDEC) and financed by the National Research Council (CONICYT). Its objectives are to create an interdisciplinary research platform; to train researchers in sustainable urban development and to establish links with practitioners and decision makers.
- The **School of Medicine from the Pontificia Universidad Católica de Chile (UC)** has vast experience in joint projects with EU countries. This is exemplified in the several associative grants that are currently under way that involves French and Chilean Researchers (LIA-CNRS,

ECOS). This interaction is not new as the School of Medicine has been an active partner in two EU projects associated to the FP6-LIFESCIHEALTH-7 initiative. Through this particular initiative they seek to gain further recognition in order to strengthen the interaction of the researchers conducting basic and applied scientific research in the fields of medicine, health sciences, infectious disease, biomedicine and biotechnology.

- **Nucleus of Investigation in natural and anthropogenic risks (RiNA)** is a research center belonging to the Austral University of Chile, composed of a highly qualified human team and made up of academics from the University itself and academics and Associated Institutions, both national and international, whose object of study is centered around the problem of the evaluation, analysis and definition of mitigation strategies against natural and anthropogenic risks in Chile and the world.
- **The Scientific and Technological Bioresource Nucleus (BIOREN)** was created in 2009 by La Frontera University in La Araucania Region. The mission of the Bio-resource Nucleus is to strengthen multidisciplinary R&D in biological resources and bio-processes associated with food production, environmental sustainability and human health; and further, to strengthen education, dissemination and outreach in bio-resources in the University, the Region and the Country.
- **The Advanced Center for Chronic Diseases (ACCDiS)**, University of Chile & Pontifical Catholic University of Chile, is working in the following scientific fields: Cardiovascular, Cancer, Epidemiology and Nanomedicine research. The Center has been awarded FONDEQUIP equipment, such as an Electronic Microscope for the development of nanotechnology, as well as a vacuum sputtering metallizer (self-funded) and a Nanosight to study exosomes. Also, ACCDiS has infrastructure adequate to study cardiovascular and cancer, such as a Langendorff setup, a digitizer for gastric tumors and a flow cytometer, among other equipment.
- **The Institute for Biological and Medical Engineering (IBME), Pontificia Universidad Católica de Chile.** The Institute is an interdisciplinary academic unit of the University that does research, teaching and outreach in the intersection of technology, health and sciences. Its objective is to apply the principles of engineering and design in engineering to solve problems in the areas of medicine and biology; and to employ cells, live organisms and principles of biology to solve problems in the areas of engineering, medicine and other disciplines.

5.3.6 Colombia

Survey results

Key facts	<ul style="list-style-type: none"> - COLCIENCIAS is responsible for financing RI and the political decision-making process in Colombia - There is few single-sited equipment - A possibility for collaboration could be PhD and post-doc programmes where the beneficiaries have to spend time outside the country. Colombia would be
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able to receive them.

Corporación Colombiana de Investigación Agropecuaria (CORPOICA)

CORPOICA has 13 research centers and 10 affiliated sites located in the different agricultural regions of the country. These centers carry out research on vegetables, fruits, permanent crops, transient crops, roots and tubers, cocoa and livestock (cattle and smaller species).

Since 1994, CORPOICA has been in charge of the Germplasm Banks System of the Colombian Nation, which includes three subsystems: vegetable, animal and microorganisms. Each subsystem conserves biological entities of economic importance for the country.

Centro De Investigación en Tecnologías Aeroespaciales (CITAE)

CITAE is the research center responsible for developing activities related to the space program and formative research in support of the training programs of the Military School of Aviation. Capabilities include the implementation of research and development of technological activities in aerospace projects, manufacturing design and transfer of industry, parts and components as well as aerospace vehicle systems, wind tunnel testing of aerodynamic surfaces and prototype manufacturing.

Centro de Desarrollo Tecnológico Aeroespacial para la Defensa (CETAD)

The CETAD investigates the topics of meteorology, geographic information systems of the Colombian Airforce and civic institutions.

CETIA The CETIA carries out activities to maintain and improve capabilities that reduce the knowledge gap and technological dependence with the Design, Development and Certification of Aeronautical Products and complementary aeronautical systems thus promoting the Colombian Aeronautical Industry.

Instituto Nacional de Salud (INS)

The National Institute of Health has the following objectives: (i) the development and management of scientific knowledge in health and biomedicine to contribute to improving the health conditions of people; (ii) carry out basic and applied scientific research in health and biomedicine; (iii) the promotion of scientific research, innovation and the formulation of studies in accordance with the public health priorities of knowledge of the Institute; (iv) health surveillance and safety in the areas of its competence; the production of biological inputs; and (v) act as a national reference laboratory and coordinator of special networks.

Centro Internacional de Entrenamiento e Investigaciones Medicas (CIDEIM)

CIDEIM is a center for research, technological development and training of human resources in the field of health. Its purpose is to look for alternatives to reduce the negative impact and costs of infectious diseases. To achieve their mission, they reach agreements with the public, productive and academic health sectors at the national

and international levels.

Fundación Instituto de Inmunología de Colombia (FIDIC)

FIDIC has consolidated in the field of the development of synthetic vaccines and is one of the research centers with the highest scientific productivity in the country.

Centro de Estudio de Enfermedades Autoinmunes (CREA)

The RI has a declared interest in developing strategies of inter-institutional cooperation among multiple centers at the local, national and international levels and favour the development and scientific progress of researchers through responsible training.

Red de Cambio Climático y Seguridad Alimentaria de Colombia (RICCLISA)

The RI is dedicated to information management and knowledge about climate change, monitoring and evaluation of water resources, coverage dynamics and production systems, intercomparison of growth prediction models and crop production.

Centro Internacional de Agricultura Tropical (CIAT)

Since 1967 the Center has collaborated closely with its host country, Colombia, based on a shared conviction that agricultural research is an important tool for generating new technologies, methods, and knowledge that better enable farmers, particularly low-income smallholders, to make their production more eco-efficient: that is, competitive, profitable, sustainable, and resilient. CIAT works in close cooperation with CORPOICA.

CENIPALMA

Cenipalma offers specialized technical services for the development of agronomic units and fertilization management. It has laboratories with services for the characterization and quality determination of oils and fats, soil and water for cultivation and wastewater from agro industry. Additionally, it offers Geoportals for the monitoring of palm crops and agro-climatic monitoring systems (Smac-palma) and geographic information for the agronomic management of plantations (Sigpalma). It has experimental fields and demonstration laboratories where training sessions are held around different topics.

Centro Nacional de Investigaciones de Café (Cenicafé)

The RI offers the following services: Coffee agro-climatic platform, Soil Analysis Report and Interpretation System, Digital Repository, Wikinsecta.

Centro de Investigación de la Cana de Azúcar de Colombia (CENICANA)

The RI offers the following services: Disease diagnosis service; Phytopathological inspection service in the field and laboratory, service of multiplication and

propagation of varieties, soil and foliar tissue analysis service for fertilization recommendations.

Instituto de Investigación de Recursos Biológicos Alexander von Humboldt

The IAvh, studies the sciences, territorial management, evaluation and monitoring of biodiversity, social sciences and knowledge of biodiversity and biological collections.

Instituto Amazónico de Investigaciones Científicas (SINCHI)

It is an entity that generates and supplies hydrological, meteorological and environmental information for the definition of public policies and decision-making related to sustainable development and the prevention of the effects of climate change.

Instituto de Investigaciones Ambientales del Pacífico (IIAP)

The IIAP is an entity linked to the Ministry of Environment and Sustainable Development, belonging to the National Environmental System – SINA. It carries out environmental, productive, eco systemic and socio-cultural studies of the Colombian Pacific.

Instituto de Hidrología, Meteorología y Estudios Ambientales (IDEAM)

It is an entity that generates and supplies hydrological, meteorological and environmental information for the definition of public policies and decision-making related to sustainable development and the prevention of the effects of climate change.

Instituto de Investigaciones Marinas y Costeras “José Benito Vives de Andrés” (INVEMAR)

The institute conducts basic and applied research on renewable natural resources and the environment in coastal and ocean ecosystems.

The Corporation Center of Excellence in Marine Sciences (CEMarin)

CEMarin is a non-profit mixed entity, created in 2009 as an academic and scientific consortium for the study of problems in the field of marine sciences and the application of the knowledge obtained to the resolution of them. In 2015 it became a corporation founded by six universities (the Universidad Nacional de Colombia, the Universidad de los Andes, the Universidad de Bogotá Jorge Tadeo Lozano, the Universidad de Antioquia, the Universidad del Valle and the Justus-Liebig University, in Giessen, Germany), that collectively address current problems in this field of knowledge that cannot be solved by isolated individuals or institutions.

Observations Suggestion by Colombia: Develop a joint data base including all RI relevant for the LAC countries in order facilitate the international cooperation.

Complementary data

RIs mapped in the OEI-report “Grandes Instalaciones Científicas en Iberoamérica” (2009) and the EuroRIs-Net+ Report (2013) - updated through desk research:

- **Oceanographic research vessels: The ARC Providencia and the ARC Malpelo** were both built in 1981 in Germany and are operated by the National Navy. They operate with equipment for oceanographic research in the disciplines of physics, chemistry, meteorology, biology and marine geology.

RIs included in the EU-LAC-RI Working Group process

- **National Network of Research and Innovation on Clean, Advanced and Efficient Combustion for the Industrial Sector-INCOMBUSTION**, a space for analysis and reflection on the existing policies in the country on issues of energy efficiency and rational use of energy.
- **National Network on Energy Efficiency Knowledge (RECIEE)**. The Colombian network is a joint effort of 17 Colombian universities working together to create national competences for the development, promotion and adoption of technology and practices in the energy efficiency area. RECIEE has developed multiple projects together with public, industrial, energy, certification, normalization and academic organizations, in research, technology development and innovation projects, contributing to the country development.
- **INSTITUTO NACIONAL DE CANCEROLOGIA (INC)** does research in the field of cancer care and control through early detection and prevention in cancer, using biobanks and radio pharmacy.

5.3.7 Costa Rica

Survey results

Key facts	<p>Costa Rica identified 18 RIs that might be of interest for this process.</p> <p>Four RI are already open to be accessed by RI from other LAC countries:</p> <p>Instituto Costarricense de Investigación y Enseñanza en Nutrición y Salud (INCIENSA)</p> <ul style="list-style-type: none"> - Health discipline in the areas of: Nutrition, especially of children, infectious diseases, chronic diseases, epidemics. <p>Centro de Investigación en Biotecnología del Instituto Tecnológico de Costa Rica (CIB)</p> <ul style="list-style-type: none"> - Areas: Plant biotechnology, biomedical and plant research. <p>Centro de Investigación en Biología Celular y Molecular de la Universidad de Costa Rica (CIBCM)</p> <ul style="list-style-type: none"> - Basic and applied research - Areas: Biology, genetics of plants and threatened species; viruses and other plant pathogens and their vectors; environmental microbiology and gene
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prospecting; genetics and human pathology.

Centro de Investigación en Hematología y Trastornos Afines de la Universidad de Costa Rica (CIHATA)

- Human health in the areas: Molecular genetics; biochemical diagnosis etc.

Centro de Investigaciones en Ciencias del Mar y Limnología de la Universidad de Costa Rica (CIMAR)

- Areas: Oceanography and limnology, organisms, environment and marine and freshwater processes of Costa Rica.

Centro de Investigaciones Espaciales de la Universidad de Costa Rica (CINESPA)

- Areas: Space research, radio astronomy, cyclotron radiation in strong magnetic fields and their variations.

Centro para Investigaciones Granos y Semilla de la Universidad de Costa Rica (CIGRAS)

- Areas: Technology, postharvest of seeds and grains, genetic improvement, biotechnology, mycotoxins and grain and seed quality analysis.

Centro de Investigaciones en Producción de Cultivos de la Universidad de Costa Rica (CIPOC)

- Areas: Laboratory of Acarology, Laboratory of Arvenses, Laboratory of Entomology, Laboratory of Phytopathology, Laboratory of Nematology, Laboratory of Vertebrate Pests, Laboratory of Molecular Techniques.

Instituto de Investigaciones Agrícola de la Universidad de Costa Rica (IIA)

- Areas: Agrifood issues.

Centro de Investigación en Ciencias Atómicas, Nucleares y Moleculares (CICANUM) de la Universidad de Costa Rica

- Areas: X-rays, nuclear electronics and nuclear physics. The projects are interdisciplinary, located within the framework of the national reality in the areas of health, agriculture, geophysics and industry.

Centro de Investigación en Electroquímica y Energía Química de la Universidad de Costa Rica (CELEQ)

- Energy areas: Electrochemistry and chemical energy, its production, storage, transformation and application.

Centro de Investigación en Enfermedades Tropicales de la Universidad de Costa Rica (CIET)

- Health in the areas of infectious diseases.

Instituto de Investigaciones en Salud de la Universidad de Costa Rica (INISA)

- Human health.

Centro Mesoamericano de Desarrollo Sostenible del Trópico Seco de la Universidad Nacional de Costa Rica (CEMEDE)

- Areas: Climate change and Biodiversity

Centro de Recursos Hídricos para Centroamérica y el Caribe de la Universidad Nacional de Costa Rica (HIDROCEC)

- Areas: Water treatment and reuse, integrated watershed management, water quality.

Centro de Investigación y Extensión en Materiales del Instituto Tecnológico de Costa Rica (CIEMTEC)

- Areas: Metallography and chemical analysis; sands and metal smelting; Metallurgy; thermal and thermochemical treatments; electron microscopy, polymer processing, modelling and simulation.

Centro de Investigación y de Servicios Químicos y Microbiológicos del del Instituto Tecnológico de Costa Rica (CEQIATEC)

- Areas: Chemical and microbiological contaminants.

Costa Rica identified five RI that already have in place an institutional collaboration with other RI in LAC countries:

Centro Nacional de Ciencia y Tecnología de Alimentos de la Univerisdad de Costa Rica (CITA)

- In the discipline of food, the following areas: added value of agro-industrial products through technological innovation and the stimulation of systems and products of high certifiable quality.

Laboratorio Nacional de Nanotechnology (LANOTEC)

- Areas: Advanced materials for research, design and training in technologies associated with microtechnology, nanotechnology and materials science.

Centro Nacional de Innovaciones Biotecnológicas (CENIBIOT)

- Areas: Plant cells and phototrophic organisms (Green Biotechnology), bioprocesses (White Biotechnology), genomics and molecular biology (Gray Biotechnology), bioprospecting (Blue Biotechnology), health (Red Biotechnology).

Colaboratorio Nacional de Computación Avanzada (CNCA)

- Areas: Convergence and application of computer science in the natural sciences, engineering, humanities, social sciences and arts.

Instituto Clodomiro Picado de la Universidad de Costa Rica (ICP)

- Areas: Herpetology, microbiology, cellular and molecular biology, immunology, experimental pathology, biochemistry and biotechnology
- Type of RI: Laboratories of general type, as well as laboratories of biochemistry, proteomics, histology, microscopy, cell culture, molecular biology, bioassays and biosecurity.

Observations No further details on access policies and existing collaborations were specified

Complementary data
RI's mapped in the OEI-report "Grandes Instalaciones Científicas en Iberoamérica" (2009) and the EuroRIs-Net+ Report (2013) - updated through desk research:

- **Volcanological and Seismological Observatory (OVSICORI)** created in 1986, is a University Research Institute of the National University (OVSICORI-UNA) dedicated to the investigation of volcanoes, earthquakes and other tectonic processes, with the purpose of finding useful applications for society to help mitigate the adverse effects of these phenomena on economic and social development.
- **The Organization for Tropical Studies (OTS)** is a non-profit consortium of about fifty universities, colleges, and research institutions worldwide. Founded in 1963, OTS' mission is to provide leadership in education, research, and the responsible use of natural resources in the tropics.

RI's included in the EU-LAC-RI Working Group process

- **Centro Nacional de Alta Tecnología (CeNAT)** is a program of the Consejo Nacional de Rectores (CONARE). It includes four laboratories and 2 programs:
 - LANOTEC Laboratory: R+D+I at Nanotechnology and new materials
 - CENIBIOT Laboratory: Focused in scaling biotechnology processes
 - PRIAS Laboratory: Focused at geomatics research
 - CNCA Laboratory: Specialized on parallel processes, modelling and high performance computing problems solving
 - Weather Observatory Program: It analyses weather changes and variability through friendly high technology resources, to support agriculture producers and disasters prevention and mitigation
 - Agromatics Program: It leads added value for national and regional products, on a high technology base and multivariable analyses; also a producers increasing support on the Slow Food philosophy

5.3.8 Cuba

Survey results

Key facts

- Cuba delivered a list of 117 RIs that are ready to be open for possible institutional collaboration with other RI in LAC countries.
- Around 50 percent of the identified RIs are from the area of medical and agriculture sciences.
- Another important amount of RIs are from the area of technical sciences, natural and exact sciences and social sciences and humanities
- Except of the Investigation Center for Global Economy which is closely cooperating with LAC networks from the area of Social Sciences and Humanities.
- Please find the complete list as an Annex to this document. Cuba also defined the following list of 13 RIs that already have in place an international collaboration with other RIs, mostly in LAC countries:

The **Centro de Investigaciones de la Economía Mundial (CIEM)** develops research projects in topics related to globalization and trends in the world economy, international trade, international finance, regional economic integration, energy and environment.

The **Centro de Aplicaciones Tecnológicas y Desarrollo Nuclear (CEADEN)** participates in national research programs such as nuclear, laser and optical applications and the national basic science program, both aimed at human health.

The **Centro Nacional de Sanidad Agropecuaria (CENSA)** is a collaborating center for the Caribbean in preparation for emergencies of transboundary animal diseases.

The **Instituto de Investigaciones en Fruticultura Tropical (IIFT)** is the scientific institution that governs the development, quality, profitability and sustainability of fruit trees through the use of conventional and advanced technologies.

The **Centro de Investigaciones y Desarrollo del Petróleo (CEINPET)** collaborates mainly with Venezuela.

The **Centro de Investigaciones para la Industria Minero Metalúrgica (CIPIMM)** was founded in 1967 and collaborates with RIs in Argentina.

The **Instituto de Geología y Paleontología (IGP)** maintains collaboration with the geological service of Mexico, Brazil (CPRM) and Argentina (SGMAR).

The **Instituto de Medicina Tropical “Dr. Pedro Kouri” (IPK)** participates in the network ZIKALLIANCE, a global alliance for Zika virus control and prevention; IDAMS Project - International Research Consortium on Dengue Risk Assessment, Management, and Surveillance, DENFREE Project - Dengue research Framework for Resisting Epidemics in Europe.

The **Instituto Nacional de Higiene, Epidemiología y Microbiología (INHEM)** was

created in 1902 and is a reference center for the development of the specialty of Hygiene and Epidemiology and Microbiology in the National Health System (SNS).

The **Centro de Neurociencias de Cuba (CNEURO)** is dedicated to brain research and the development of neurotechnology to protect mental health. The entity coordinates the national program of science, technology and innovation of Neurotechnologies.

The **Instituto Finlay de Vacunas (IFV)** has collaboration agreements signed with the University of Leiden and the Pasteur Institute of Paris as well as historical collaborations with scientific institutions such as ESPROMEDBio in Venezuela, Biomanguños in Brazil, the INPB of Argentina, UAEM in Mexico.

The **Centro de Investigación y Desarrollo de Medicamentos (CIDEM)** is the entity that researches and develops medicines, nutritional supplements and cosmetics under the conception of international practices.

The **Centro de Gestión de Información y Desarrollo de la Energía (CUBAENERGÍA)** participated in the GISELA project - grid initiatives for e-science virtual communities in Europe and Latin America, EELA-2 Project - e-science grid facility for Europe and Latin America.

Observations

- All RIs identified by Cuba are available for international collaboration
- Science, technology and innovation priorities for Cuba are:
Food production; development and use of renewable energy sources; climatic changes; science application in the physics, planning strategy; software industry; use of hydric resources; nanotechnology
- Cuba formulated the interest in focussing more on the question how to increase the participation of enterprises.

Complementary data

RIs mapped in the OEI-report “Grandes Instalaciones Científicas en Iberoamérica” (2009) and the EuroRIs-Net+ Report (2013) - updated through desk research:

- The **Center for Genetic Engineering and Biotechnology of Cuba (CIGB)** is the scientific research center of Cuba that works in the fields of medicine and biology, and improving the fields of human health, the agricultural sector and the environment. It represents one of the most important research centers in Cuba.
- The **Molecular Immunology Center** opened in 1994, it conducts research and development for the production of new biopharmaceuticals for the treatment of cancer and other chronic diseases and is currently expanding its infrastructure to more than double the area covered, with the installation of fermenters at a productive scale.

RIs included in the EU-LAC-RI Working Group process

- **Centro de Estudios Avanzados de Cuba (CEAC)** carries out research and training of human resources in the field of nanosciences and nanotechnologies

- **National Centre for Animal and plant Health** works in diagnostic, characterization and management of animal diseases of economic impact, diagnostic, characterization and management of pests in the main crops of economic impact for the country, development of products contributing to animal, plant and human health, food safety and quality with an integral approach on the food chain.

5.3.9 Ecuador

Survey results

Key facts	<p>Ecuador has identified a total of 18 RIs that have open access to foreign researchers and are of interest for a regional and bi-regional collaboration.</p> <p>Two institutes were identified that are already open to transnational access:</p> <p>The National meteorological and hydrological institute (INAMHI), which grants access through national and international interinstitutional conventions</p> <p>The National Institute for Biodiversity (INABIO) has one of the most important scientific collections of the region in its museum and herbarium, which are available for all researchers. Furthermore, its team offers services such as taxidermy, identification of species, and deposition of the same.</p> <p>Fifteen institutions were identified that are ready to be opened for possible institutional cooperation:</p> <p>INAMHI, mentioned above, would be interested in establishing institutional collaborations with the objectives to exchange knowledge, techniques and protocols with other laboratories.</p> <p>The National Institute for Energy Efficiency and Renewable Energies (INER) is active in different sectors in which it provides capacities and infrastructures and offers services to external researchers. Its laboratories collaborate under scientific cooperation conventions. INER has laboratories from the following areas at its disposal:</p> <ul style="list-style-type: none"> - Biomass - Lighting technologies - Thermal test and energy efficiency - Thermal characterization <p>The National Institute of Agricultural Research (INIAP) has five experimental stations at its disposal offering R&I activities, equipment technology transfer and the production of seeds for different agricultural areas:</p> <ul style="list-style-type: none"> - Estación Experimental del Austro (EEA) - Estación Experimental Central de la Amazonía (EECA) - Estación Experimental Litoral Sur (EELS) - Estación Experimental Portoviejo (EEP) - Estación Experimental Santa Catalina (EESC)
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- Estación Experimental Santo Domingo (EESD)
- Estación Experimental Tropical Pichilingue (EETP)

The public **National Fishery Institute (INP)** offers services and guidance in the sector of fishery and aquaculture.

The **National Institute on Cultural Heritage Sites (INPC)** offers research and technical cooperation for stylistic, technology and material analyses on cultural goods

The **University Andina Simón Bolívar** - Center for Research and Laboratories for Assessment of Impacts in Collective Health (UASB – CILAB Salud) offers scientific cooperation for the implementation, operation, accreditation and development, in analytical techniques.

Eleven institutions were identified that already have institutional collaboration:

INHAMI has alliances with the French National Research Institute for Sustainable Development (France) through the project “GREATICE”, and the Pyrenean Ecologic Institute (Spain)

The **INPC** has technical collaborations with the National Institute for Nuclear Research (ININ) from Mexico.

The research laboratories of **INIAP** have collaborations with different institutes:

- EEA: CIMMYT, Mexico; INTA, Argentina; CORPOICA, Colombia
- EECA: **CATIE, Costa Rica**
- EELS: CIAT, Colombia
- EEP: CIMMYT, Mexico; EMBRAPA, Brazil
- EESC: INTA, Argentina; INIA, Chile; Coproica, Colombia; CIMMYT, Mexico
- **CORPOICA, Colombia**
- Conventions and Technology Transfer with the IPK, Cuba, Instituto Oswaldo Cruz de Rio de Janeiro, Public Health Institute, Chile, Universidad de la República de Uruguay

Conventions for joint research with PER, ARG, CCHL, BRA, URU through the Antarctic treaty.

Observations Ecuador launched four calls for research programmes and projects, whereby in the call 2017 a share up to 50.000 USD could be used for RIs.

Furthermore, the Geoportal for Scientific Research (GIC) contains information about the RI in the country.

Complementary data

RIs mapped in the OEI-report “Grandes Instalaciones Científicas en Iberoamérica” (2009) and the EuroRIs-Net+ Report (2013) - updated through desk research:

- The **Antarctic research base Pedro Vicente Maldonado** is situated at Guayaquil Bay, Greenwich Island. It is located in the South Shetland Islands, Antarctica. It opened in 1990. The area was visited by early 19th century sealers operating from nearby Clothier Harbour.
- The **Oceanographic Ship Orion**, belonging to the Ecuadorian Navy, has the objective of monitoring in situ the real conditions of the ocean. It is a hydrographic and oceanographic research unit designed to carry out work in physical oceanography, marine biology, marine geology, meteorology, environment, hydrographic surveys, seismic prospecting, sediment sampling and navigation aids.

5.3.10 El Salvador

Survey results

Key facts	<p>El Salvador has identified seven RIs that have open access to foreign researchers and are of interest for a regional and bi-regional collaboration.</p> <p>From these seven institutions, all enable access to foreign researchers, and are ready to be opened for institutional collaborations. Four of them additionally already have institutional collaborations in place.</p> <p>Centro de Investigaciones y Aplicaciones Nucleares (CIAN)</p> <p>It was founded by the Government of El Salvador in cooperation with the International Atomic Energy Agency (IAEA) with the objective to carry out technological transfer actions on peaceful terms in different areas.</p> <p>Instituto de Ciencias del Mar y Limnología of the University of El Salvador (ICMARES)</p> <p>No further information on access conditions.</p> <p>The Centro Nacional de Investigaciones Científicas de El Salvador (CICES)</p> <p>CICES has the objective to find solutions of strategic problems of the country and the region in the areas of health and energy. It seeks to interact with higher education institutions and other research centres. To access the facility the researcher has to submit a formal request which has to be approved by the CICES coordinator. It furthermore collaborates with other institutions through trainings, internships, exchanges and workshops.</p> <p>The Centro de Investigación y Desarrollo de Salud (CENSALUD)</p> <p>It deals with the diagnosis and monitoring of the treatment of infectious diseases. It was established with the support by the Government of Spain.</p> <p>The Parque Tecnológico en Agroindustria (PTA)</p> <p>PTA is an interinstitutional platform between government, private enterprises and academia. No further information about the involvement of foreign actors and</p>
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Observations	<p>existing institutional collaborations.</p> <p>The Centro Nacional de Investigaciones en Ciencias Sociales y Humanidades (CENISH)</p> <p>No further information on access conditions for foreign researchers available.</p> <p>Laboratorio de Toxinas Marinas de la Universidad de El Salvador (LABTOX-UES)</p> <p>No further information on access conditions for foreign researchers available.</p> <p>No detailed information about access conditions and existing collaborations are available.</p>
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5.3.11 Guatemala

Survey results

Key facts	<p>In Guatemala, the Universities have their own budget and are independent from the Ministry of Education. RIs are almost non-existent.</p>
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5.3.12 Honduras

Survey results

Key facts	<p>Honduras identified a total of ten RIs that grant open access to foreign researchers and are ready to be opened for international collaboration.</p> <p>Instituto de Ciencia y Tecnología de la República de Honduras (IHCIETI)</p> <p>The IHCIETI has a network of institutions with which they promote the culture of research, technological development and innovation. It is a member of Science and Technology programs, develops actions of promotion and transfer of technology.</p> <p>Universidad Nacional Autónoma de Honduras - Centro de Investigaciones Genéticas (UNAH)</p> <p>The UNAH has state-of-the-art equipment where the general population can be tested for paternity through DNA studies at its disposal. Furthermore, it Annually implemented key programmes are to promote projects of applied Research and Science and Technology Competitions.</p> <p>Escuela Agrícola Panamericana el Zamorano (EAP – Private institution)</p> <p>The EAP addresses the prevalence of diseases in Central America and an expansion in the laboratory work for Human Nutrition, poultry laboratory research and teaching.</p>
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Universidad de Agricultura - Laboratorio en Ciencias Agrícolas (UNA)

Applied research projects.

Universidad Pedagógica Nacional Francisco Morazán (UPNFM)

It has technical units specialized in the development of research, educational and social research: National Observatory of National Education, Educational Research and Innovation Center, Institute of Technological Innovation, Center for Professional Teaching Practice, Renewable Energy Laboratory, Business Didactic Laboratory, Experimental and Didactic Farm in process, Access to Information Center, Chemistry and Microbiology Laboratory.

Secretaria de Agricultura y Ganadería de la República de Honduras (SAG)

At the sectoral level, the SAG coordinates the aspects related to sectoral policies that are executed by institutions that make up the agricultural public sector, specifically those related to land tenure, rural financing, marketing, forestry, agricultural production and rural and forestry development.

Secretaria de Salud de la República de Honduras

At the sectoral level, it coordinates the aspects related to the Public Sector in Health.

Universidad Nacional de Ciencias Forestales (UUNAESNACIFOR)

It comprises technical units specialized in the development of agricultural and livestock research.

Secretaria de Relaciones Exteriores de la República de Honduras

The Directorate oversees propitiating the strengthening of cooperation mechanisms with governments, international organizations and regional integration / coordination Systems, through the Foreign Service and in coordination with the Technical Secretariat of Planning and External Cooperation, for facilitating the access to resources and the implementation of new strategies to expand international cooperation towards Honduras. It counts with technical units specialized in the development of agricultural and livestock research.

Secretaria de Recursos Naturales (MIAMBIENTE)

At the sectoral level, it coordinates the aspects related to policies regarding natural resources and biodiversity.

Instituto de Innovación Tecnológica (IITEC)

Technical unit specialized in research, technological development and knowledge transfer. It serves as an interlocutor between the universities and the society and enterprises.

Observations	<p>No further information about access conditions and existing collaborations are available.</p> <p>During the Montevideo meeting, Honduras formulated a special interest in exchanging experiences and best practices regarding the following questions:</p> <ul style="list-style-type: none"> - What kind of patenting models are successful? - What kind of technology transfer is used in LAC countries?
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Complementary data

RI mapped in the OEI-report “Grandes Instalaciones Científicas en Iberoamérica” (2009) and the EuroRIs-Net+ Report (2013) - updated through desk research:

- The **Central American Astronomical Observatory of Suyapa / UNAH** is the largest astronomical observatory in Central America, part of the National Autonomous University of Honduras. The research and training center is responsible for organizing, directing and developing higher education in the fields of space science in general, and specifically in astronomy and astrophysics, and remote perception. It has an astronomical observation dome, computer networks and communications and a perception laboratory.

5.3.13 Mexico

Survey results

Key information on RI	<p>Mexico is currently conducting a cataloguing of all equipment that requires a logbook. That means that they do not include laboratory equipment but infrastructure that can be shared. The requested categories include type of equipment, function, description, institution, etc. They can be classified by field of knowledge according to the parameters of the National System of Researchers and also according to the UNESCO ones. At the moment the catalogue comprises approximately 1700 records. It is planned that the user can consult the equipment through the filters according to the needs of the project. The catalogue will be ready in 2019.</p> <p>Furthermore, Mexico sent information on six categories of large-scale RIs. Two of the RI, the Gran Telescopio Milimétrico and the High-Altitude Water Cherenkov observatory from the scientific area of astronomy form part of the list of global RIs from June 2015. The response of Mexico included the recommendation to consider the advances of the Group of Senior Officials on Global RIs for the EU-LAC dialogue.</p> <p>The other RIs are oceanographic research vessels by the army and the Autonomous National University of Mexico (UNAM). Furthermore, they identified a network of supercomputing which is also located at the UNAM and a nuclear reactor.</p>
Observations	<p>No further information on access conditions and institutional partnerships were delivered.</p>

Complementary data

Information from CONACYT

The Mexican **National Council of Science and Technology – CONACYT** published at the end of 2018 a comprehensive overview of the RI landscape in Mexico: **“INFRAESTRUCTURA CIENTÍFICA Y TECNOLÓGICA. La base para transitar hacia una sociedad y economía del conocimiento.”**, which includes information on the following topics:

Collaboration programs to share scientific and technological infrastructure

- Conacyt National Laboratories
- Conacyt Thematic Networks
- Mexican Energy Innovation Centers
- Consortiums of Public Research Centers
- Regional development programs
- International collaboration to share infrastructures:
 - o European Council for Nuclear Research (CERN)
 - o The search for dark energy (The Dark Energy Spectroscopic Instrument (DESI))
 - o Pierre Auger Observatory, Argentina
 - o Laboratories and international units

Big investments to explore the universe:

- National Astronomical Observatory in the Sierra de San Pedro Mártir, Baja California
- The Great Alfonso Serrano Millimeter Telescope in Sierra Negra, Puebla
- Observatory of gamma rays (HAWC)

Digital infrastructure

- The National Consortium of Scientific and Technological Information Resources (Conicyt)
- Mexican Journals of Science and Technology

For further information please check the corresponding Directory of the Mexican National Laboratories: <https://www.conacyt.gob.mx/index.php/el-conacyt/desarrollo-cientifico/programa-de-laboratorios-nacionales/directorio-In>

CONACYT also published a list of centralized services offered by the National Laboratories under the following thematic areas:

- Characterization of materials and their properties
- High performance computing and image analysis
- Human and veterinary health
- Design and manufacture of prototypes, modelling
- Exploration of the Earth and the Universe
- Complex problems and decision making

For further information please check: <https://www.conacyt.gob.mx/index.php/el-conacyt/desarrollo-cientifico/programa-de-laboratorios-nacionales/listado-de-servicios-que-otorgan-los-laboratorios-nacionales-conacyt>

RIIs mapped in the OEI-report “Grandes Instalaciones Científicas en Iberoamérica” (2009) and the EuroRIs-Net+ Report (2013) - updated through desk research:

- **Large Millimeter Telescope:** The Large Millimeter Telescope Alfonso Serrano (or Gran Telescopio Milimétrico Alfonso Serrano) is the world’s largest single-dish steerable millimeter-wavelength telescope designed specifically for astronomical observations in the wavelength range of 0.85 – 4mm. This binational project between México and the United States of America represents the largest and most complex scientific instrument constructed in México. Situated on the summit of Volcán Sierra Negra at an altitude of 4600 meters, the LMT has begun its exploration of the physical processes that lead to the formation and evolution of planetary systems, stars, black-holes and galaxies throughout the 13.7 billion year history of the universe.
- Mexico has three **oceanographic vessels: Justo Sierra, El Puma and Alpha Hélix**, owned by the UNAM (National Autonomous University of Mexico). Their use is organized by the **Coordinación de Plataformas Oceanográficas** and is oriented towards scientific research for better knowledge and use of the Mexican seas.

5.3.14 Nicaragua

Survey results

Key information on RI

In the frame of the project “Program for Strengthening the Competitiveness of Nicaraguan MSMEs”, a Map of Actors was created with the objective to survey and classify relevant entities in the country. From this list, 58 actors from the academic sector and non-governmental organisations were identified that are relevant for this analysis. In the section below a selection the entities are listed that represent more than one organization and the technology park. For the complete list please consult the author.

Consejo Nacional de Universidades (CNU)

Institution that groups 10 universities, 5 public and 5 private (and 37 research centres belonging to these universities). It is an important actor in the field of higher education, promoter, organizer, and active participant in spaces of analysis in the educational system. It contributes to the definition and implementation of national, sectoral and international policies, participates in the definition and execution of strategies for Human Development. Its mission is the comprehensive training of graduate and postgraduate professionals, the generation and dissemination of knowledge through research and innovation with quality.

Consejo Superior de Universidades Privadas (COSUP)

It groups 15 private universities of Nicaragua.

Federación de Universidades Privadas (FENUP)

It groups 15 private universities of Nicaragua.

Fundación para el Desarrollo Tecnológico Agropecuario y Forestal de Nicaragua (FUNICA)

The Foundation for the Technological Development of Agriculture and Forestry of Nicaragua (FUNICA) is an institution of civil nature and works on a non-profit basis. It is currently constituted by 24 associates of the public and private sector, associations of agricultural and forestry producers, universities, NGOs, professional associations of sciences and agronomy.

FUNICA contributes to the strengthening of the competitiveness of the agricultural and forestry sector in Nicaragua by influencing policies and promoting and developing capacities for technological innovation. Among the most relevant programs are technology markets, through which small local companies of agricultural technologies are supported to improve their capacities to offer better technology and services to small and medium producers and map technology suppliers. It has a Business Management and Innovation Center oriented towards the market of agricultural products and technologies and business services aimed at satisfying the demand of companies, producers and other actors within the various productive and value chains in the agricultural and forestry sector.

Technology Park

Its mission is "Contribute to the technological development of the country's companies by aiming at improving products and processes, promotion of entrepreneurship and the transfer of technologies that adjust to the reality and need of producers, entrepreneurs, the academic sector and society. It concentrates on the areas of Biotechnology, construction technology, woodworking and textiles".

Centro Tecnológico de Agroindustria (CETEAL) – Food

CETEAL was born as part of the execution of the Technological Innovation Support Project (PAIT), financed with IDB resources. Its mission is to provide innovative and practical services to the national food industry, creating new capabilities and technological developments to achieve competitiveness and the insertion of new products in national and international markets.

Centro de Tecnología e Innovación para las Pymes (CETIPYME)

The Center for Technology and Innovation for SMEs is focused on providing services in the wood, textile and leather-footwear sectors, mainly in design.

Instituto Nacional de Tecnología (INATEC)

Autonomous entity with legal personality and its own assets, in charge of managing, organizing, planning, controlling and evaluating activities of the National Systems of Training and Technical Education.

Instituto Tecnológico Nacional (INTECNA)

State educational center of technical professional training and national coverage with the orientation to train people with professional skills in the technological areas that demand the economic development of the country.

Centro de Investigación en Ciencias Agrarias y Economía Aplicada (CICAEA)

Research centre of the Faculty of Sciences and Technology of UNAN-LEON. It is focused on strengthening the development pole in the UNAN-León, it benefits the producers of the West of Nicaragua and the Central Americans. The centre focuses on the systems of agricultural production, livestock, forestry, aquaculture and apiculture in investigative function of food and nutrition security and adaptability and mitigation to climate change.

Observations The access and collaboration conditions are not specified any further.

5.3.15 Panama

Survey results

Key information on RI	<p>Panama has identified thirteen RIs that are of relevance for a regional collaboration. Most of them grant access to foreign researchers.</p> <p>The Centro Nacional de Metrología (CENAMEP)</p> <p>It is responsible for developing and keeping national measurement standards by conducting scientific studies and comparisons with national institutes for meteorology from other countries. It has the recognition of the International Bureau of Weights and Measures (BIPM) and participates in international comparisons, in order to adapt national measurements to the requirements of international conventions and treaties governing world trade.</p> <p>Instituto de Investigaciones Científicas y Servicios Alta Tecnología de Panama (INDICASAT-AIP)</p> <p>The objective of the INDICASAT-AIP is to establish a platform for the scientific and technological progress of Panama, contributing to the formation of human resources of excellence in research and development in the different priority disciplines of the country.</p> <p>Laboratorio de Achiotines (CIAT)</p> <p>It is one of the world's few research centres of the tropical tuna fish. CIAT established close links with universities, government agencies, and private research, organizations and institutions at the local, national, and international levels e.g. with scientists from the Universidad de Oriente (Venezuela).</p> <p>Smithsonian institute (STRI)</p>
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The STRI is the only dependency outside of the US. It's dedicated to contributing to knowledge about the biological diversity of the tropics. STRI has about 40 permanent resident scientists and dozens of associates and postdoctoral fellows and receives around 900 visiting scientists and students each year. Although its base is in Panama, STRI scientists work in more than 40 countries around the world.

Seismic Observatory of Panama Occidente (OSOP)

OSOP combines multidisciplinary and international experience e.g. from Argentina, Colombia, Costa Rica, Cuba, Panama, Venezuela. Since it is a private company, it defines its access conditions for international researchers but is not open to international collaboration.

Technological University of Panama (UTP) and its regional centres

No further information about access conditions and institutional collaborations are available.

Furthermore, Panama has research institutions from different thematic areas at its disposal without further information on the access conditions for international researchers:

- Centro Experimental de Ingeniería (CEI)
- **Centro de Investigaciones Hidráulicas e Hidrotécnicas (CIHH) in the area of water and environment, both at the public and private levels. The studies are financed by the UTP as well as national and international agencies and companies.**
- Centro de Producción e Investigaciones Agroindustriales (CEPIA)
- Centro de Investigación, Desarrollo e Innovación en Tecnologías de la Información y las Comunicaciones (CIDITIC)
- Centro de Investigación e Innovación Eléctrica, Mecánica y de la Industria (CINEMI)

Coiba Island Biological Station (under construction)

SENACYT will complete the construction and its administrator is already hired. Its governance model will soon be defined as one of the activities of its administrator.

Observations Every research centre, through its director and principal investigators, decides on the research agenda on its own. From the point of view of the management of the National Science Policy in Panama, SENACYT serves as interlocutor, since all or almost all of the research centres in the country are SENACYT clients. The research centers compete in the calls for financing of research projects, which in some cases contain the purchase of minor equipment and laboratory supplies.

Furthermore, SENACYT finances training and capacity building measurements by providing international training grants to scientists from Panama to learn how to use RI systems.

5.3.16 Paraguay

Survey results

Key information on RI	Paraguay identified a variety of RIs available to be open for possible institutional collaboration or institutionally planned for collaboration. All identified RIs are single-sited scientific equipment. There is no data available with regard to the objectives for a potential collaboration. The RIs identified are single-sited scientific equipment. The equipment indicated is from the areas of medical sciences, natural sciences, agriculture and engineering and technology. The list comprises i.a. a blood component separator; Chromatograph; X-ray apparatus; spectrophotometer. For the complete list please consult the author.
Observations	Since no further information on the technical equipment and its use is available, the potential for future cooperation cannot be specified.

5.3.17 Peru

Survey results

Key information on RI	Peru identified 40 RIs that are ready to be open for possible collaboration with other RI in LAC countries. The capacities identified are concentrated on universities and research centres. For all institutions, the expression of interest is formulated to carry out national and international collaborations as well as providing services to public and private sectors. There is no data available with regard to the objectives, existing agreements or access policies and conditions for the collaboration. The institutions cover research areas in all disciplines. For the complete list please consult the author.
Observations	Since no further specification on the collaboration interests, resources and facilities is available, no further assessment of the collaboration potential can be made.

Complementary data

RIs mapped in the OEI-report “Grandes Instalaciones Científicas en Iberoamérica” (2009) and the EuroRIs-Net+ Report (2013) - updated through desk research:

- The **Antarctic Affairs Division** under the Ministry of Foreign Affairs is the body responsible for implementing actions to promote and ensure the active and permanent presence of Peru in Antarctica in the framework of the Antarctic Treaty. Among its specific functions are formulating, evaluating and implementing the National Antarctic Program; organizing scientific expeditions to Antarctica (ANTAR); and maintenance and management of Peru's **Machu Picchu Research Station**.
- **B.I.C. Humboldt** is a Peruvian **oceanographic research vessel**, with polar capacity, built in 1978 in Callao, Peru, in cooperation with the German Government. The ship has a capacity

of 100 people, including crew and scientific staff. The vessel has visited Antarctica on several occasions to assist the Peruvian Antarctic Machu Picchu Base.

- The **BAP Carrasco** is an **oceanographic research vessel** of the Peruvian Navy built in 2016 in Spain. Its purpose is to perform oceanographic research cruises both, in Peruvian waters and in the Antarctica, in order to fulfil Peru's commitment under the Antarctic Treaty.

RIs included in the EU-LAC-RI Working Group process

- **Ingeniería del Medio Ambiente – Pontifica Universidad Católica del Perú** conducts research projects on the environment and biodiversity.
- **Centro de Energías Renovables y Uso Racional de la Energía – Universidad Nacional de Ingeniería (CER-UNI)**. The Center for Renewable Energies is a specialized center of the National University of Engineering in applied research, technological development and technology transfer of renewable energies. It is recognized as a pioneer and continuous promoter of renewable energy projects in Peru.

5.3.18 Uruguay

Survey results

Key information on RI	<p>Red Clara Uruguay (RedClara) - Latin American Cooperation of Advanced Network</p> <ul style="list-style-type: none"> - Areas: e-Infrastructure; advanced computer connectivity, computer networks, ICT, etc. - LAC Cooperation: Connected with 13 LAC countries; planned to be expanded to 7 more <p>Instituto Polo Tecnológico de Pando (IPTP)</p> <ul style="list-style-type: none"> - Areas: Biotechnology; fine chemistry; environment; food and nutrition; nanotechnology and materials; biopharmacy and pharmaceutical technology; bioanalytics; drugs and doping; renewable energy; sensometry and consumer science - Type of RI: Tandem mass spectrometer; chromatograph; spectroscopy; polarimetry etc. - Collaboration framework agreements: University of Granada, Ministry of Education of El Salvador, UTU, Science Park, Ricaldoni Foundation, AMBIOTEC (Associacao Mineira of Biotechnology and Life Sciences Companies), BH.TEC - Belo Horizonte Technological Park, National University of Córdoba, CARTIF Center - Institutional agreement with: Cousa, International Association of Science Parks and Areas of Innovation (IASP), PCTP APRE (RED RICH) - The IPTP has a KHEM scientific and technological base incubator that provides support to various ventures; It is part of the SEPE Technology Center; <p>Institute Pasteur Montevideo (IPMon)</p>
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- Areas: Biology, biochemistry, bioinformatics, bio pharmacy and health
- Type of RI: Platforms, laboratories, services
- IPMon forms part of the innovation consortium together with the Pasteur Institute, Clemente Estable Institute and INIA.

Institute for biological research Clemente Estable (IIBCE)

- Areas: Neurosciences, microbiological sciences and genetics, molecular biology
- Type of RI: Chromatography, Microscopy

Uruguayan Center for Molecular Imaging (CUDIM)

- Areas: Health; clinical research; biomedicine
- Type of RI: Cyclotron (particle accelerator); radiopharmacy; computed tomography
- International agreements:
 - o Agreement with the Department of Biomedical Engineering of Peking University, to develop joint research and promote the exchange of students.
 - o CUDIM-National Cancer Institute of Paraguay.
 - o Nuclear Medicine Service of Santa Casa de Misericordia of Porto Alegre, Brazil.
 - o Creation of an innovation consortium together with the Pasteur Institute, Clemente Estable Institute, INIA and Pando Technology Center. Training of professionals from Costa Rica, Argentina, Brazil, Chile, Paraguay, Colombia, Venezuela, Mexico, Cuba, Portugal and Iran.
 - o **The CUDIM management team is made up of members of the Cyclotron-PET University Commission, with international scientists and technicians, particularly from the University of Uppsala, Sweden.**
 - o To promote research, CUDIM has called specialists from the region and contributed to the creation of a Latin American network (CLAIM: Latin American Club of Molecular Imaging).

Innovation Forum

- Consisting of IPMON, INIA, CUDIM, PCTP, IIBCE.
- Areas: Animal health, biomedicine, genomics, energy, environment and green chemistry.
- Cooperation with LAC countries:

Argentina: INTA, UBA, National University of Córdoba, EE Bishop Colombes, Institute Fleni, Nuclear Diagnostic Center Foundation, Leloir Institute, CONICET-UNC, Museum Botanical of Cordoba, National University of Mar del Plata. *Brazil:* Embrapa, Fiocruz, BH-TEC, Institute of the Brain (INSCER), USP (University of San Pablo), UFRGS, UFRJ, UERJ, UFPR, UFBA, UEL, ULBRA, South American network for nanobiotechnology in biomimetic systems. *Bolivia:* INIFAP. *Chile:* INIA, Positron Pharma, University of Chile -Fac. of Medicine, University of La Border. *Colombia:* University of the Andes, University of Bogotá Jorge Tadeo Lozano. *Cuba:* Molecular Immunology Center of Cuba,

Center for Protection and Hygiene of Radiation, National Institute of Sciences Agricultural (INCA). *Paraguay*: IPTA, National University of Assumption.

- Cooperation with International Partners: IAEA (International Atomic Energy Agency).
- Cooperation with European partners:
Spain: IRTA, INIA, AECID, CYTED, IATA Valencia, CARTIF. *Germany*: JKI, Technological University of Berlin, University of Kassel. *France*: INRA. *Austria*: University of Innsbruck. *UK*: Rothamsted Research. *Ireland*: Teagasc.
Holland: Wageningen, Netherlands Cancer Institute (NKI). *Sweden*: UPPSALA University.

Center for Biomedical Research (CEINBIO)

- Areas: Structural biology, metabolomics, enzymatic mechanisms, etc.
- Type of RI: i.a. Spectrophotometer; flow cytometer; Hypoxic camera; HPLC system; high speed centrifuges.
- Alliances with: Alexander von Humboldt Foundation (Germany), Center for Structural Biology of Mercosur (CEBEM), International Center for Genetic Engineering and Biotechnology (ICGEB).

Unit of Sciences of the Sea and the Atmosphere

- Institutes: FING, IMFIA, SOHMA, DINARA, FCIEN, Instituto Antártico del Uruguay.
- Areas: Marine science, population dynamics, physical, chemical and biological oceanography; Antarctic research; climate variability and predictability; climate change.
- Type of RI: i.a. Navigation channel, wind tunnel, oceanographic research ships, Antarctic research base; High performance computing cluster; flow cytometer.

National Institute of Agricultural Research (INIA)

- Areas: Agriculture; agroindustry
- Type of RI: i.a. laboratories; bank of genomic animal DNA
- Collaboration: The mixed unit together with the Institute Pasteur Montevideo is generated between both institutions as a way to optimize the scientific-technical exchange and achieve a space of full integration of the work teams of both institutions. It works on a general framework focusing on the development of three programs: one dedicated to genomics applied to agriculture, another to veterinary health and a third to the area of bio-inputs.
- PROCISUR is the platform "Use of Emerging Technologies" through which the promotion of the development and use of emerging technologies is sought to improve the competitiveness and sustainability of agriculture, taking advantage of the integrated development of biotechnology, nanotechnology, precision agriculture and TICs.
- BiotecSojaSur I and II: Integrated genomic approach in MERCOSUR for the prospection of useful genes for the improvement of soybean against biotic and abiotic stress. The BiotecSojaSur projects are regional projects carried out by research institutions in Brazil, Argentina, Paraguay and Uruguay and whose

	<p>main objective is the identification of useful genes and markers for the improvement of soybean against biotic and abiotic stress, particularly drought.</p>
Observations	<p>The RIs identified by Uruguay are very well connected among the other national institutions as well as in LAC and internationally. There are several initiatives for a more efficient cooperation among the institutions (Innovation Forum, BiotecSojaSur I and II etc.).</p>

Complementary data

RIs mapped in the OEI-report “Grandes Instalaciones Científicas en Iberoamérica” (2009) and the EuroRIs-Net+ Report (2013) - updated through desk research:

- The **General Artigas Station** is the larger of the two Uruguayan scientific research stations in Antarctica, the other one being the **Ruperto Elchiribehety Base**. The bases depend on the Uruguayan Antarctic Institute Plans & Operations Direction which is ruled by an Interministerial Council. Uruguay, a consultative member of Antarctic Treaty since 7 October 1985, has a permanent, active and autonomous activity as a National Governmental Program in Antarctic.
- **OYARVIDE** is a **research vessel** built in 1966. It is dedicated to cartographic and hydrographic survey works in the Uruguay River, Río de la Plata and the Uruguayan ocean coast.

5.3.19 Venezuela

Survey results

Key facts	<p>In Venezuela there are five universities that are the drivers for the sector of Science and Technology. Besides, there are 15 research centres that are independent from the universities and belong to the Ministry of Education. Therefore, they might be opened directly for a potential intraregional collaboration.</p> <p>Priority areas are health (e.g. Dengue, diseases transmitted by mosquitoes), agrifood, seismology, generic program, renewable energies, housing & construction.</p> <p>In particular, Venezuela identified the following institutes that would be ready to be opened for a possible institutional collaboration:</p> <p>Fundación Centro Nacional de Investigación y Certificación (CENVIH): Fatigue testing for real size structures from the area of engineering and urbanism.</p> <p>Fundación Instituto de Ingeniería (FII): Atomic force microscope.</p> <p>Fundación Venezolana de Investigaciones Sismológicas (FUNVISIS): Seismology equipments.</p>
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Instituto de Materiales y Modelos Estructurales (IMME): Mechanical testings for real size structures in the scientific domain civil engineering.

Fundación Centro de Investigaciones de Astronomía “Francisco J. Duarte” (CIDA): Astronomy observation telescope.

6 SUGGESTIONS FOR LAC REGIONAL CASES AND APPROACHES

Based on the information received from the LAC countries, specific RIs and initiatives will be highlighted that could be of interest for broadening and deepening the regional collaboration on RIs. According to the starting situation of each country, the structure of the national RI landscape and the interest and objectives by the individual RIs, every country has the possibility to check if any of the suggestions might be of interest for connecting and up-scaling their national RI. The following criteria serve as basis for the selection of regional case studies:

- RI that have formulated access conditions and grant access to researchers from other LAC countries
- RI which have already institutional collaborations with RI from other LAC countries
- RI that offers a high added-value to RI from other LAC and European countries
- RI from a thematic area that are of specific relevance for a number of LAC countries

6.1 SUGGESTION 1: EXPAND EXISTING REGIONAL INFRASTRUCTURES AND ITS INITIATIVES

One of the RI networks that were listed by two countries, Uruguay and Argentina, is RedCLARA - Latin American Cooperation of Advanced Networks. It is a non-profit international law organisation that was established in 2003. It provides intraregional interconnection and is also internationally linked to advanced networks in other regions such as Géant2 (Europe) and Internet2 (USA) and through them to C@ribnet (Caribbean) (RedCLARA, 2017).

RedClara is constituted by thirteen Latin American countries and is planning to expand to seven more. Taking the expansion into consideration, the network covers all countries that participated in the survey. In its survey, Argentina refers to an additional programme connected to RedCLARA and supported by nine countries which is the federal network “La Referencia”. Its objective is to open the access to digital repositories across Ibero-American countries.

Due to its intraregional character and the legal status as international organisation as well as in the individual countries, RedCLARA has a major exemplary function in supporting a transnational access to RIs among LAC countries.

Another example of RI networks is the new initiative for a **Latin American Strategy Forum for Research Infrastructure (LASF4RI)** which seeks to initiate a dialogue for establishing a joint vision for the scientific development of Latin American RIs working in the field of particle physics and cosmology. The thematically oriented approach allows focusing of international cooperation and helps in detecting the overlap of efforts and making use of existing synergies.

6.2 SUGGESTION 2: NETWORKING PROGRAMMES AS INTERMEDIARIES

Some of the LAC countries have national programmes and initiatives in place to promote the networking and the accessibility of the national RIs. In the case of Argentina the programme National Large Equipment Systems, for Chile the Scientific and Technological Equipment Program (FONDEQUIP) and in Mexico the online database of Mexican RIs are important intermediaries in order to systematically collect and provide information on the existent RIs and its availabilities without restrictions to thematic research areas. They provide information about the type of RI,

services, conditions and further information such as funding opportunities. The availability of the information facilitates the access for national actors and serves as entry point and facilitator for establishing collaborations with researchers from other countries. The Argentinean portal for National Large Equipment Systems works on the conditions of a shift system without any discrimination of country the researcher's is applying from. But to make use of the facility, the researcher must be in Argentina. The Chilean FONDEQUIP serves as intermediary, the access conditions depend on the individual facilities.

On a regional level the **Ibero-American program of science and technology for development (CYTED)** finances the coordination activities of thematic networks. The financing includes the mobility of the member groups, the organization of workshops and courses and the issue of publications. The Thematic Networks are clusters of research and development (R&D) formed by public or private entities and corporations from the member countries of the CYTED Programme, whose scientific or technological activities are related within a common area of interest and included in one of the Programme Areas: Agrofood, Health, Industrial Development, Sustainable Development, ICTs, Science and Society, Energy and Business Incubators.

The systematic collection of the national research structures and their availabilities serves as an orientation for other countries to promote the visibility of their national facilities. The added-value is generated by creating a central entry point in the RI system of a country.

Additionally, centralized collection and publication of regional funding opportunities (e.g. open calls) would help to enhance the transnational cooperation within the LAC-region and with Europe.

6.3 SUGGESTION 3: SUB-REGIONAL HUBS

To also consider priority areas that are of special interest for a specific sub-region, it might be relevant for some countries to foster collaboration with their neighbouring states. Research topics might be similar because of the geographical proximity, the climate, environmental, societal and/or cultural conditions and contexts. An example might be the research for the Amazonian region which is conducted in several countries. **Similar collaboration might be interesting for example for research areas in Antarctic research, tropical biodiversity or tropical diseases.**

Table 2: Cross-cutting: Research for the Amazonian region

Country	Institution	International Collaboration
Bolivia	Centro de Investigación y Producción para la Amazonia	
Brazil	Instituto Nacional de Investigaciones de la Amazonia	It offers postgraduate programs in: Agriculture in the humid tropics, Botany, Biology, Tropical forest science, Entomology, Genetics, Conservation and Evolutionary Biology and Aquaculture.
Brazil	Museo Paraense Emilio Goeldi	
Brazil	Instituto de Desarrollo sostenible Mamirauá	
Ecuador	Estación Experimental Central de la Amazonía	Collaboration with CATIE (Costa Rica)

Table 3: Environment: Antarctic research

Country	Institutes	International collaboration
Argentina	Pampa Azul (PA)	PA addresses Marine Infrastructure with the objective to collaborate in the development of research technologies and renewable sea energies.
Chile	National Antarctic Institute (INACH)	INACH is a Research Institute responsible to coordinate the Antarctic's investigation. Logistic support is one of their main concerns. There are two ways for national and international researchers to access to INACH support: Through collaboration agreements with other Antarctic programmes or through professional relationships without formal agreements.
Uruguay	Unit of Sciences of the Sea and the Atmosphere	Marine sciences, population dynamics, physical, chemical and biological oceanography. Antarctic Research-Navigation Channel, Wind Tunnel, Oceanographic Research Boats, Antarctic Research Base

6.4 SUGGESTION 4: COLLABORATIONS AMONG THEMATIC RESEARCH INSTITUTIONS

Revising the information provided by the countries, some of the national RIs are working on similar thematic issues. In the following a suggestion for potential thematic groupings of LAC national RI are provided according to the thematic disciplines of the European Strategy Forum on RIs. Identifying topics of regional interest and promoting the collaboration of institutions working in this field might serve as a starting point for creating intraregional thematic hubs. Institutions from other countries

working on similar issues might have the possibility to connect. Please note that the overview of countries and institutions listed below under the different topics are not exclusive but might be seen as recommendations for potential collaborations derived from the information provided by the countries which might be joined by additional countries and institutions in case it is of interest. In the following some examples of thematic groups of research identified by the participating countries will be highlighted.

In addition, the LAC delegates of the EU-LAC RI WG are currently listing their prioritized RIs related to thematic areas per country. The results of this mapping will be available at the end of 2019.

Table 4: Environment: Meteorology

Country	Institutes	International collaboration
Barbados	Caribbean Institute for Meteorology and Hydrology (CIMH)	16 member countries: Anguilla, Antigua and Barbuda, Barbados, Belize, British Virgin Islands, Cayman Islands, Dominica, Grenada, Guyana, Jamaica, Montserrat, St. Kitts/Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, Turks and Caicos Islands
Cuba	Instituto de Meteorología	
Ecuador	Instituto Nacional de Meteorología e Hidrología (INAMHI)	Grants access through national and international interinstitutional conventions
Panama	Observatorio Sísmico de Panamá Occidente (OSOP)	OSOP combines international and multidisciplinary experience from Argentina, Belgium, Colombia, Costa Rica, Cuba, Germany, India, Italy, Panamá, Poland, Russia, Ukraine, Venezuela and the USA
Uruguay	Unidad de Ciencias del Mar y de la Atmósfera (Facultad de Ingeniería; Instituto de Mecánica de los Fluidos e Ingeniería Ambiental; Servicio de Oceanografía, Hidrografía y Meteorología de la Armada; Dirección Nacional de Recursos Acuáticos; Facultad de Ciencias, Instituto Antártico del Uruguay)	Marine sciences, population dynamics, physical, chemical and biological oceanography. Antarctic Research-Navigation Channel, Wind Tunnel, Oceanographic Research Boats, Antarctic Research Base

Table 5: Environment: Marine biodiversity

Country	Institutes	International collaboration
Argentina	Pampa Azul (PA)	PA addresses Marine Infrastructure with the objective to collaborate in the development of research technologies and renewable sea energies.
Chile	National Antarctic Institute (INACH)	INACH is a Research Institute responsible to coordinate the Antarctic's investigation. Logistic support is one of their main concerns. There are two ways for national and international researchers to access to INACH support: Through collaboration agreements with other Antarctic programmes or through professional relationships without formal agreements.
Costa Rica	Centro de Investigaciones en Ciencias del Mar y Limnología de la Universidad de Costa Rica (CIMAR)	
El Salvador	<ul style="list-style-type: none"> Instituto de Ciencias del Mar y Limnología, University of El Salvador (ICMARES) Laboratorio de Toxinas Marinas de la Universidad de El Salvador (LABTOX-UES) 	
Uruguay	Unit of Sciences of the Sea and the Atmosphere	Marine sciences, population dynamics, physical, chemical and biological oceanography. Antarctic Research-Navigation Channel, Wind Tunnel, Oceanographic Research Boats, Antarctic Research Base

Table 6: Physical Science & Engineering: Astronomy

Country	Institution	International Collaborations
Argentina	Large Equipment for Astronomy (eg LLAMA, ABRAS)	Access through the working groups in charge of the technologies involved
Brazil	National observatory	Astronomy, Geophysics and Metrology in Time and Frequency; Postgraduation programs
Mexico	Gran Telescopio Milimétrico. Volcán Sierra Negra, Estado de Puebla	Part of the Global Research Infrastructures
Mexico	Observatorio High Altitude Water Cherenkov. Parque Nacional Pico de Orizaba, Estado de Veracruz	Part of the Global Research Infrastructures
Venezuela	Fundación Centro de Investigaciones de Astronomía "Francisco J. Duarte" (CIDA)	Astronomy Observation Telescope

Table 7: Physical Sciences & Engineering: Metrology

Country	Institution	International Collaboration
Bolivia	Dirección de metrología industrial y científica	
Brazil	Observatorio Nacional (ON)	Major areas : Astronomy, Geophysics and Metrology in Time and Frequency; Postgraduation programmes accredited by CAPES
Cuba	Instituto Nacional de Investigaciones en Metrología (INIMET)	Development of RDI projects and provision of scientific and technological services that contribute to the development and maintenance of accurate and complex measurement systems traceable to international standards in a sustainable way.
Panama	Centro nacional de Metrología (CENAMEP)	Scientific studies and comparisons with National Institutes for Metrology from other countries. It has the recognition of the International Bureau of Weights and Measures and participates in international comparisons, in order to adapt national measurements to the requirements of international conventions and treaties.

Table 8: Physical Science & Engineering: High performance computing

Country	Institution	International Collaboration
Brazil	Laboratorio Nacional de Computación Científica	Postgraduate programs
Chile	National Laboratory for High Performance Computing	No specific access conditions for foreign researcher. Each case has to be evaluated.
Costa Rica	Colaboratorio Nacional de Computación Avanzada (CNCA)	
Mexico	Supercomputers of the Autonomous University of México (UNAM)	

Table 9: Physical Sciences & Engineering: Nuclear research

Country	Institution	International Collaboration
Bolivia	CENTRO DE INVESTIGACIONES Y APLICACIONES NUCLEARES	
Brazil	<ul style="list-style-type: none"> • Centro de Desarrollo de Tecnologia Nuclear (CDTN) • Instituto de Ingeniería Nuclear (IEN) • Instituto de Investigaciones Energéticas y Nucleares (IPEN) 	
Costa Rica	Centro de Investigación en Ciencias Atómicas, Nucleares y Moleculares (CICANUM) de la Universidad de Costa Rica	
Cuba	Centro de Aplicaciones Tecnológicas y Desarrollo Nuclear (CEADEN)	
El Salvador	Centro de Investigaciones y Aplicaciones Nucleares (CIAN)	

Table 10: Physical Sciences & Engineering: Information and Communication Technologies

Country	Institution	International Collaboration
Bolivia	Centro de Investigación en Informática Electronica y Telecomunicaciones	
Cuba	Centro de Investigaciones de la Informática UCLV	
Cuba	Instituto de Investigación y Desarrollo de las Comunicaciones	
Panama	Centro de Investigación, Desarrollo e Innovación en Tecnologías de la Información y las Comunicaciones	
Uruguay	Red Clara Uruguay	Connected countries: Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Mexico, Uruguay, Venezuela

Table 11: Health & Food: Biomedics and Biotechnology

Country	Institute	International Collaboration
Bolivia	<ul style="list-style-type: none"> Instituto de Investigación Bio Médicas Center of Biotechnology 	
Costa Rica	<ul style="list-style-type: none"> Centro de Investigación en Biotecnología del Instituto Tecnológico de Costa Rica (CIB) Centro Nacional de Innovaciones Biotecnológicas (CENIBIOT) 	
Cuba	Centro Nacional de Investigaciones Científicas	
El Salvador	Centro Nacional de Investigaciones Científicas de El Salvador	Formal request letter by the researcher (Approval by CICES Coordinator)
Nicaragua	Laboratorio de Biotecnología (EIAG)	
Uruguay	Centro de Investigaciones Biomedicas (CEINBIO)	Alliances with AvH Foundation (GER), Center for Structural Biology of Mercosur (CEBEM), International Center for Genetic Engineering and Biotechnology (ICGEB)
Uruguay	Consortio de Innovación (IPMON, INIA, CUDIM, PCTP, IIBCE)	Cooperation with CELAC countries: ARG, BRA, BOL, CHL, COL, CUB, PAR Cooperation with International Atomic Energy Agency Cooperation with European partners: SPA, GER, FRA, AUS, UK, IRE, NLD, SWE

Table 92: Cross-cut: Technological Innovation

Country	Institution	International Collaboration
Honduras	Instituto de Innovación Tecnológica (IITEC)	
Nicaragua	<ul style="list-style-type: none"> Centro de Tecnología e Innovación para las Pymes (CETIPYME) Technology Park 	
Panama	Instituto de Investigaciones Científicas y Servicios Alta Tecnología de Panama (INDICASAT-AIP)	
Uruguay	Polo Tecnológico de Pando (IPTP)	

Please Note: When considering a collaboration or comparability of RIs and create an added value among the cooperating facilities, a categorisation of the scale of RIs should be fostered. A potential indicator might be the construction and maintenance costs.

6.5 SUGGESTION 5: FIRST STEPS FOR THE COLLABORATION: SELF-ASSESSMENT OF THE NATIONAL RIs

After the selection of regional cases as pilots for a stronger regional collaboration on Research Infrastructures (RIs), all interested facilities should be asked to fill in a simple self-assessment in order to check their accessibility to foreign stakeholders. The Self-Assessment Form for Prospective New Entries from the EU-funded project MERIL (**M**apping of the **E**uropean **R**esearch **I**nfrastructure Landscape) might serve as a blueprint (Appendix B). A potential adoption might be as following:

General information of the research infrastructure:		
Name of Research Infrastructure		
English-language Website of RI		
Coordinating Country for RI		
Description of RI (what it is, general objectives, who owns/funds it, when it was established, main networks to which it belongs, principles of access to the services or facilities) [Max. 200 words]		
RI Coordinator (name and email of person authorized)		
Accessibility checklist	YES	NO
1. Does the RI have a policy of providing access to users outside of the country in which it is located or by which it is coordinated?		
2. Does the RI provide clear access rules (for example application forms, open calls and contact information) and an access point for users on a publicly available web page?		
3. Does the RI receive public funding?		
4. Does the RI have an appointed contact or manager responsible for the RI?		
5. Optional: Does the RI provide a website in English (including the access rules)?		
6. Optional: The RI is of <i>more than national relevance</i> because it...		
a) can provide evidence that it is used by non-national users by for example providing the number of non-national users per year		
b) is part of an international network		
c) has formal arrangements or agreements with international partners, for example with similar RIs in other countries		

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Appendix A LIST OF COUNTRIES AND INSTITUTIONS THAT RECEIVED THE SURVEY

Country	Institution
Argentina	Ministerio de Ciencia, Tecnología e Innovación Productiva
Barbados	Ministry of Education, Science, Technology and Innovation, Barbados
Bolivia	Viceministerio de Ciencia y Tecnología
Brazil	Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq)
Chile	CONICYT
Costa Rica	Investigación y Desarrollo MECYT
Cuba	Ministry of Science, Technology and Environment
Ecuador	Relaciones Internacionales. Secretaría de Educación Superior, Ciencia, Tecnología e Innovación
El Salvador	Ministerio de Educación, Viceministerio de Ciencia y Tecnología
Guatemala	Secretaría Nacional de Ciencia y Tecnología – SENACYT / Universidad Galileo / Secretario Nacional de Ciencia y Tecnología
Honduras	SENACIT / Universidad Pedagógica Nacional Francisco Morazán
Mexico	Consejo Nacional de Ciencia y Tecnología (CONACYT)
Nicaragua	Sent CONICYT
Panama	Instituto de Investigaciones Científicas y Alta Tecnología (INDICASAT, AIP) / Secretaria de Ciencia, Tecnología e Innovación
Paraguay	CONACYT
Peru	CONCYTEC/OFICINA DE COOPERACIÓN TÉCNICA Y ASUNTOS INTERNACIONALES - OGPP
Dominican Republic	Viceministro de Ciencia y Tecnología del Ministerio de Educación Superior, Ciencia y Tecnología (MESCyT)
Uruguay	Ministry of Education and Culture
Trinidad y Tobago	Ministry of Education
Venezuela	Ministerio del Poder Popular para Educación Universitaria, Ciencia y Tecnología

Appendix B CUBA: LIST OF RESEARCH INFRASTRUCTURES

Cuba: Research infrastructures that already have in place an international collaboration with other RIs (in Spanish language)

No.	Full name of the RI	RI acronym	Scientific domain	Brief description of the RI	Brief description of access conditions, collaborations or alliances
1	Centro de Investigaciones de la Economía Mundial	CIEM	cambio climático, otras	Desarrolla su actividad de proyectos en temas relacionados con la globalización y las tendencias de la economía mundial, comercio internacional, finanzas internacionales, integración económica regional, energía y medio ambiente, cooperación internacional y ciencia y tecnología, entre otros.	Mantiene acciones de cooperación con organismos internacionales como IPCC, PNUMA, FLACSO, UNASUR, OCLAE, entre otros. Posee redes locales, con servicios de FTP, amplio uso del correo electrónico y aceptable ancho de banda a Internet. Participaron en el proyecto LAMNET - Latin america thematic network on bioenergy
2	Centro de Aplicaciones Tecnológicas y Desarrollo Nuclear	CEADEN	salud, otras	Comercializa productos resultado de la actividad científica y tecnológica y brinda Servicios Científico y Tecnológicos (SCT) en la esfera de las tecnologías nucleares, láser, óptica y otras afines y ejecutar proyectos de I+D+I para preservar y difundir en el país el conocimiento en las ciencias nucleares, óptica y conexas. Participa en programas nacionales de investigación como el de aplicaciones nucleares, láser y óptica y el programa nacional de ciencia básicas, ambos dirigidos a la salud humana.	Participan en el proyecto IDENTITY – MSCA
3	Centro Nacional de Sanidad Agropecuaria	CENSA	alimentos y salud	Creada para contribuir a preservar y elevar la sanidad animal, vegetal y humana. Entre sus productos líderes se encuentra el SURFACEN, STABILAK, CENMAST y KLAMIC, entre otros. Es centro colaborador para el Caribe en preparación para Emergencias de Enfermedades Transfronterizas de los Animales, centro Colaborador en Epidemiología y Diagnóstico de las enfermedades Emergentes, Re emergentes y Transfronterizas de los	Proyecto MUSA - Microbial Uptakes for Sustainable management of major banana pests and diseases – RIA . También han participado en el proyecto CUBA AND MEXICO - Microbial pest control for sustainable peri-urban/urban agriculture in latin america; Proyecto BETOCARIB - Begomovirus

No.	Full name of the RI	RI acronym	Scientific domain	Brief description of the RI	Brief description of access conditions, collaborations or alliances
				Animales para el Caribe y Centro América	diseases management for sustainable production of tomato in the Caribbean; Proyecto Integrated diagnostic and recombinant vaccine development for cowdriosis and anaplasmosis; COWDANADIAVAC - , Proyecto Integrated diagnostic and recombinant vaccine development for cowdriosis and anaplasmosis
4	Instituto de Investigaciones en Fruticultura Tropical	IIFT	alimentos	Institución científica que rige el desarrollo, la calidad, la rentabilidad y la sostenibilidad de los frutales mediante el empleo de tecnologías convencionales y de avanzada.	PROYECTO Tropicsafe: Enfermedades asociadas a los procariontes transmitidas por insectos en cultivos perennes tropicales y subtropicales. Financista: Comisión Europea para la Investigación y el desarrollo
5	Centro de Investigaciones y Desarrollo del Petróleo	CEINPET	otras	Entidad creada para la ejecución de investigaciones y servicios científicos y tecnológicos y la asesoría para la cadena industrial del petróleo.	Mantiene colaboración con Venezuela. Posee redes locales, con servicios de FTP, amplio uso del correo electrónico y aceptable ancho de banda a Internet.
6	Centro de Investigaciones para la Industria Minero Metalúrgica	CIPIMM	otras	Centro fundado en 1967 por el Comandante Ernesto "Che" Guevara con el objetivo de desarrollar la minería cubana. Directamente subordinado al Grupo Empresarial Geominero Salinero (GEOMINSAL).	Mantiene colaboración con RI de Argentina. Posee redes locales, con servicios de FTP, amplio uso del correo electrónico y aceptable ancho de banda a Internet.
7	Instituto de Geología y Paleontología	IGP	otras	Tiene la misión de ejecutar investigaciones dirigidas al incremento del conocimiento geológico para diversos fines, así como, definir el potencial de recursos minero sólidos y	En la actualidad mantiene colaboración con el servicio geológico de México, Brasil (CPRM), Argentina (SGMAR). Posee

No.	Full name of the RI	RI acronym	Scientific domain	Brief description of the RI	Brief description of access conditions, collaborations or alliances
				aguas minero medicinales para satisfacer demandas nacionales , realizar el servicio geologo minero y dirigir y controlar los trabajos geológicos en el país.	redes locales, con servicios de FTP, amplio uso del correo electrónico y aceptable ancho de banda a Internet.
8	Instituto de Medicina Tropical “Dr. Pedro Kouri”	IPK	salud	Creado mediante 1982 con la misión de contribuir a mejorar la calidad de vida de la población cubana y de la comunidad internacional, ofrece servicios rápidos, especializados y de alta tecnología en la investigación, el diagnóstico, la atención médica, la docencia y la vigilancia epidemiológica; dirigidos a la prevención, control y eliminación de las enfermedades infecciosas. Desarrolla un amplio espectro de cursos, Maestrías, doctorados, residencias, entre otros. Es centro de referencia de la OPS.	Participan en la red y proyectos ZIKALLIANCE - A global alliance for Zika virus control and prevention – RIA ZIKAPLAN - Zika Preparedness Latin American Network -(RIA); Proyecto IDAMS - International Research Consortium on Dengue Risk Assessment, Management, and Surveillance, Proyecto DENFREE - Dengue research Framework for Resisting Epidemics in Europe. Tambien han participado en el proyecto UPGRADE DIAGNO MDR-TB - Improved diagnosis, drug resistance detection and control of tuberculosis in Latin America, LEPTO&DENGUE SURVEY
9	Instituto Nacional de Higiene, Epidemiología y Microbiología	INHEM	salud	Los orígenes de esta entidad datan de mayo de 1902, fecha en que se crea el Laboratorio Nacional de Cuba. La entidad es centro de referencia para el desarrollo de la especialidad de Higiene y Epidemiología y Microbiología en el Sistema Nacional de Salud (SNS).	Proyecto MILEAGE – MSCA , proyecto EVIDENCE FOR PHCR - Research evidence for primary health care reforms (phcr) to medical emergency services y en el proyecto La reforma del sistema de salud en cuba : analisis ambispectivo de la efectividad, de los costos y de la aceptabilidad del nuevo subsistema de urgencias

No.	Full name of the RI	RI acronym	Scientific domain	Brief description of the RI	Brief description of access conditions, collaborations or alliances
10	Centro de Neurociencias de Cuba	CNEURO	salud	Se dedicada a la investigación del cerebro y el desarrollo de la neurotecnología para proteger la salud mental. La entidad coordina el programa nacional de ciencia, tecnología e innovación de Neurotecnologías.	Participaron en el proyecto, PHAGOAMEBA - Development of new strategies for treatment of amoebiasis, the parasitic disease caused by entamoeba histolytica
11	Instituto Finlay de Vacunas	IFV	salud	Tiene la misión de investigar, desarrollar, producir, evaluar, negociar y comercializar conocimientos, tecnologías y productos fundamentalmente vacunas; orientando todos sus recursos tecnológicos, humanos y financieros en pos de potenciar el programa Avanzado de Vacunas, el crecimiento y desarrollo económico y la calidad de vida de la población de Cuba.	En la actualidad poseen acuerdos de colaboración firmados con la Universidad de Leiden y el Instituto Pasteur de Paris así como colaboraciones históricas con instituciones científicas como ESPROMEDBio en Venezuela, Biomanguiños en Brasil, el INPB de Argentina, UAEM en México. Posee redes locales, con servicios de FTP.
12	Centro de Investigación y Desarrollo de Medicamentos	CIDEM	salud	Entidad que investiga y desarrolla medicamentos, suplementos nutricionales y cosméticos bajo la concepción de las prácticas internacionales, y con la implementación de un sistema integrado de gestión	Participaron en el proyecto RECO PHARMA – MSCA
13	Centro de Gestión de Información y Desarrollo de la Energía	CUBAENERGÍA	energía, cambio climático, otras	Entidad que centra su actividad fundamental en el desarrollo energético, los estudios de planificación, las energías renovables, los combustibles fósiles y la energía nuclear. Desarrolla tecnologías energética aplicables en los campos de la eficiencia energética, la energía solar y la bioenergía y ejecutan proyectos de I+D+I en los campos de la energía y las aplicaciones nucleares para el desarrollo energético sostenible.	Participaron en el proyecto GISELA - grid initiatives for e-science virtual communities in europe and latin america, Proyecto EELA-2 - e-science grid facility for europe and latin america y en el proyecto EELA - EInfrastructure shared between Europe and Latin America

Appendix C MERIL SELF-ASSESSMENT FORM FOR PROSPECTIVE NEW ENTRIES



MERIL Self-Assessment Form for Prospective New Entries

If you consider that a particular research infrastructure (RI) merits an entry in the MERIL portal, please complete the form and the declaration below and send it to meril@esf.org.

The eligibility of the RI will be checked by MERIL team and the relevant [National or International Data Intermediaries](#), normally within one month, and you will be informed of the decision and any further action required.

Name of Research Infrastructure	
English-language Website of RI	
Coordinating Country for RI	
Description of RI (what it is, general objectives, who owns/funds it, when it was established, main networks to which it belongs, principles of access to the services or facilities) Max. 200 words	
RI Coordinator (name and email of person authorized to update information about RI on MERIL portal – different from person listed as contact on MERIL portal, who is a public contact person)	

Please read carefully:

Definition

The MERIL project established the following definition of research infrastructures:

A European Research Infrastructure is a facility or (virtual) platform that provides the scientific community with resources and services to conduct research in their respective fields. These research

infrastructures can be single-sited or distributed or an e-infrastructure and can be part of a national or international network of facilities, or of interconnected scientific instrument networks.

Furthermore:

- RIs offer recognised, established scientific and technological facilities or services
- RIs permit free access or regulate access through a transparent selection process based on scientific quality and project feasibility
- RIs are managed according to sustainable principles and have a long-term perspective
-

MERIL Checklist of criteria for inclusion

MERIL has established a checklist of questions that define whether an RI is eligible to be included in MERIL:

MERIL eligibility checklist	YES	NO
1. Does the RI have a policy of providing access to users outside of the country in which it is located or by which it is coordinated?		
2. Does the RI provide clear access rules (for example application forms, open calls and contact information) and an access point for users on a publicly available web page?		
3. Does the RI provide a website in English (including the access rules)?		
4. Does the RI receive national, regional or European public funding?		
5. Does the RI have an appointed contact or manager responsible for the RI?		
6. The RI is of <i>more than national relevance</i> because it...		
a) can provide evidence that it is used by non-national (European or international) users by for example providing the number of non-national users per year		
b) is part of a European or international network		
c) has formal arrangements or agreements with international partners, for example with similar RIs in other countries		

An RI is considered to be eligible to be included in MERIL if it can answer “yes” to all questions 1-5 and if at least one statement under 6 (a, b, or c) applies.



This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 654296