P20.1 CITIZEN SCIENCE FROM THE IBEROAMERICAN PERSPECTIVE:

An overview and insights by the RICAP network

RICAP

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Introduction

Objective:

To provide preliminary overview of the practice and study of Citizen Science (CS) in Iberoamerica and the Caribbean.

Methods:

CS experiences refer to projects or initiatives that "actively involve citizens in scientific endeavor that generates new knowledge or understanding" (ECSA 10 Principles of Citizen Science).

33 search terms (SPA/POR/ENG) encompass the diversity of CS experiences in Iberoamerica and the Caribbean. A survey and expert opinion helped identify them (Box 1).

The Search involved:

✓ Literature review of bibliographic databases for the entire region — 1-3

- **Sources:** SCIELO, DialNet, SCOPUS, Web of Science

SCIELO (mostly SPA / POR)	419 publications
DialNet (mostly SPA / POR)	4,605 publications
SCOPUS (mostly ENG)	51,154 publications
Web of Science (mostly ENG)	146,315 publications

✓ Search of written and audiovisual publications not found in bibliographic databases: — 2-4-5-6

9 countries and regions with completed searches and documented levels of effort

340 publications that document CS experiences were registered

- **Sources:**
  - Existing databases of past regional or national inventories and surveys
  - Systematic, standardized Google searches
  - Personal Experience of co-authors (~expert opinion)

Box 1. Search terms used for literature review and search of written and audiovisual publications ot found in bibliographic databases (SPA / POR / ENG)

	SPANISH (SPA)	PORTUGUESE (POR)	ENGLISH (ENG)
	SEARCHED TERMS:		
1.	Censo participativo	Censo participativo	Participatory census
2.	Ciencia amateur	Ciência amadora	Amateur science
3.	Ciencia campesina	N/A	N/A
4.	Ciencia democrática	Ciência democrática	Democratic science
5.	Ciencia ciudadana	Ciência cidadã	Citizen science
6.	Ciencia cívica	Ciência cívica	Civic science
7.	Ciencia colaborativa	Ciência/Pesquisa colaborativa	CoLlaborative science
8.	Ciencia criolla	N/A	N/A
9.	Ciencia comunitaria	Ciência comunitária	Community science
10.	Ciencia indígena	Ciência indígena	Indigenous science
11.	Ciencia participativa	Ciência/Pesquisa participativa	Participatory science
12.	Investigación acción	Investigação/Pesquisa ação	Action Research
13.	Investigación acción participativa	Investigação/Pesquisa ação participativa	Participatory action research
14.	Investigación colaborativa	Investigação/Pesquisa colaborativa	Colaborative research
15.	Investigación participativa	Investigação/Pesquisa participativa	Participatory research
16.	Laboratorio ciudadano	Laboratório cidadão	Citizen Laboratory, Lab
17.	Mapeo participativo	Mapeamento participativo	Volunteer mapping
18.	Monitoreo comunitario	Monitorização comunitária / Monitoramento comunitário	Community monitoring
19.	Monitoreo voluntario	Monitorização voluntária / Monitoramento voluntário	Volunteer monitoring
20.	Monitoreo participativo	Monitorização participativa / Monitoramento participativo	Participatory monitoring
21.	Monitoreo ambiental participativo	Monitorização ambiental participativa / Monitoramento ambiental participativo	Enviromental participatory monitoring
22.	Partipación pública en investigación científica	Participação pública na investigação científica	Public participation in scientific research
23.	N/A	N/A	Extreme citizen science
24.	N/A	N/A	Crowdsourcing
	OTHER TERMS NOT SEARCHED HERE:		
25.	Ciencia abierta	Ciência aberta	Open science
26.	Ciencia común	Ciência comum	N/A
27.	Espacios alternativos de investigación	Espaços alternativos de pesquisa	Alternative research spaces
28.	Conocimiento local	Conhecimento local	Local knowledge
29.	Espacio maker	Espaço maker	Makerspace
30.	Observatorio ciudadano	Observatório Cidadão	Citizen Observatory
31.	Hacker-espacios	Espaços hacker	Hackerspaces
32.	Tecnología cívica	Tecnología cívica	Civic technology

Findings

1 — 200,000+ indexed publications on CS in Iberoamerica and the Caribbean found through search in bibliographical databases (Figure 1).

67% of all publications in Scielo and DialNet (mostly SPA / POR) are found in 5 countries (Spain, Colombia, Mexico, Brazil and Chile).

85% of all publications in SCOPUS and Web of Science (mostly ENG) are found in 5 countries (Brazil, Spain, Portugal, Mexico, Argentina).

/ Differences among countries likely respond to differences in science policies, incentive systems in Academia, and differences in publishing culture among disciplines.

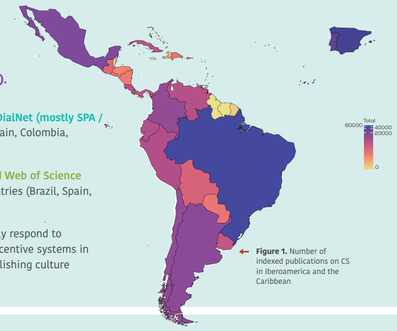


Figure 1. Number of indexed publications on CS in Iberoamerica and the Caribbean

2 — 699 different CS experiences documented in 340 publications from sources outside bibliographic databases (Figures 2a and 2b)

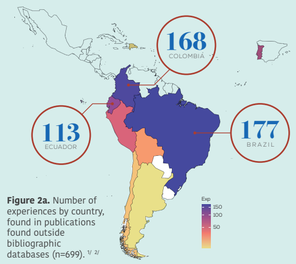


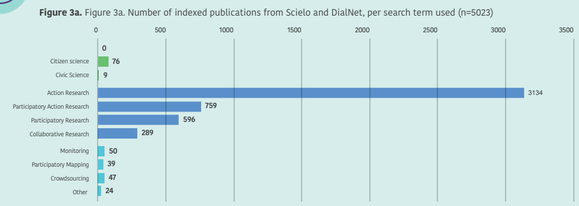
Figure 2a. Number of experiences by country, found in publications found outside bibliographic databases (n=699). 1/ 2/

Figure 2b. Quality of search for experiences in publications outside bibliographic databases, by country. 1/ 2/ 3/

1/ Countries searched: Argentina, Bolivia, Brazil, Chile, Colombia, Dominican Republic, Ecuador, Peru, Portugal.
2/ Amazonia (including Bo/Br/Co/Ec/Pe), Brazil, Colombia and Portugal include information from reports and databases on citizen science experiences independently generated in these countries and regions.
3/ Advanced = completed survey of all search terms and/or incorporates results of prior survey reports and databases; Medium = completed at least half of search words or incorporates results of prior survey reports and databases.

3 — Multiple terms used in publications to name CS experiences may reflect diverse conceptualization of public engagement in science (Figure 3a)

Figure 3a. Figure 3a. Number of indexed publications from Scielo and DialNet, per search term used (n=5023)

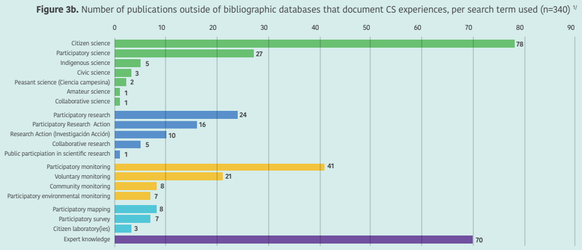


Scielo and DialNet:

95% of all publications are concentrated in the terms "Action Research" (62%), "Participatory Action Research" (15%), "Participatory Research" (12%) and "Collaborative Research" (6%) concentrate 95% of all publications.

2% This is consistent across all countries. Citizen Science follows with 2%: out of 50 hits for CS, 32 are from Spain, 9 from México and 9 from Chile

Figure 3b. Number of publications outside of bibliographic databases that document CS experiences, per search term used (n=340) 1/



The search terms that resulted publications that lead to specific CS experiences can be grouped in three main categories, broadly reflecting different fields of study and practice:

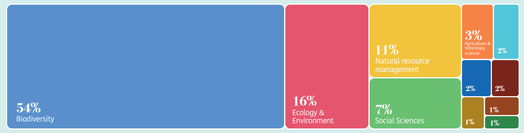
Science" **117 hits** Research" **56 hits** Monitoring" **95 hits**

1/ Source: publications not found in bibliographical databases. Countries : Argentina, Bolivia, Brazil, Chile, Colombia, Dominican Republic, Ecuador, Peru, Portugal.

4 — 685 CS experiences in 9 countries involved 13 different science fields (from publications not found in bibliographic databases)

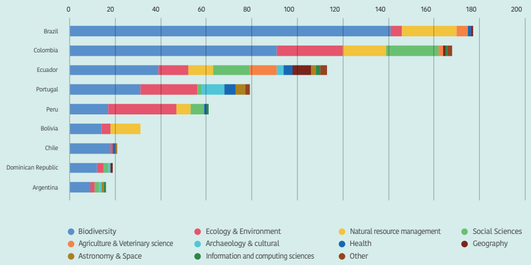
81% of all CS experiences are concentrated in the fields of Biodiversity, Ecology and Environment, and Natural Resource Management.

Figure 4a. Percentage of CS experiences by science field (n=685) 1/ 2/



1/ Source: publications not found in bibliographical databases. Countries: Argentina, Bolivia, Brazil, Chile, Colombia, Dominican Republic, Ecuador, Peru, Portugal.
2/ Science field classification from Bowser et al. 2017.

Figure 4b. Number of CS experiences by science field (n=685) 1/ 2/



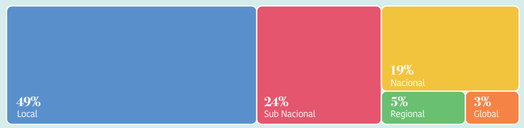
1/ Source: publications not found in bibliographical databases. Countries: Argentina, Bolivia, Brazil, Chile, Colombia, Dominican Republic, Ecuador, Peru, Portugal.
2/ Science field classification from Bowser et al. 2017.

5 — The practice is mostly place-based

73% of the sample are local and subnational CS experiences.

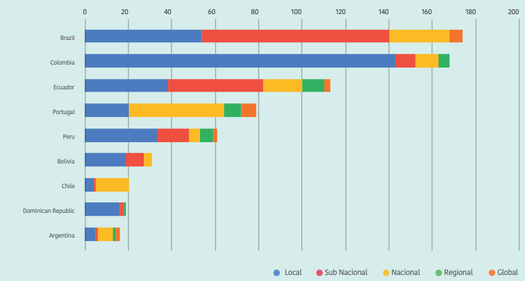
8% of the sample are regional and global CS experiences

Figure 5a. Percentage of CS experiences by spatial scope of work (n=681). 1/



1/ Source: publications not found in bibliographical databases. Countries : Argentina, Bolivia, Brazil, Chile, Colombia, Dominican Republic, Ecuador, Peru, Portugal.

Figure 5b. Number of of CS experiences by spatial scope of work and country (n=681). 1/



1/ Source: publications not found in bibliographical databases. Countries : Argentina, Bolivia, Brazil, Chile, Colombia, Dominican Republic, Ecuador, Peru, Portugal.

[1] University of Chicago
[2] Wildlife Conservation Society
[3] Red CC Amazonia
[4] Institut de Ciències del Mar (ICM-CSIC)
[5] Open University of Catalonia UOC
[6] Pontifical Catholic University of Minas Gerais, Brazil
[7] Argentine Ministry of Science, Technology and Innovation
[8] Colegio De La Salle Bogotá
[9] CIUHCT, Faculdade de Ciências, Universidade de Lisboa, Lisboa, Portugal
[10] Rede Portuguesa de Ciência Cidadã
[11] Alexander von Humboldt Biological Resources Research Institute
[12] Museo Argentino de Ciencias Naturales "Bernardino Rivadavia"
[13] GBIF Argentina
[14] Colegio Montessori de Cartagena
[15] Universidad del Quindío
[16] LIFIA, ECPBA-Facultad de Informática, UNLP
[17] Depto. CyT, UNQ

Concluding remarks

The practice of CS in Iberoamerica and the Caribbean has specific features, best practices and lessons that can enrich the global field of citizen science… further research is needed!

Expanding and deepening this research is critical to strengthen CS study and practice in the region, e.g.:

- ✓ Collect more data!
- ✓ Analyze how differences in the sources consulted reflect differences in the frequency of hits per search term and thus possible differences in the conceptualization of CS in the region.
- ✓ Build a conceptual framework that effectively responds to the epistemic diversity observed for CS study and practice in Iberoamerica and the Caribbean.

Three areas (posed here as questions or hypotheses) are especially important for further inquiry, analysis and discussion.

- ✓ **CS to inform decisions, improving livelihoods, conserving nature:** Where and under which conditions is CS a core activity for local livelihoods that informs decisions (e.g., biodiversity monitoring, natural resource management, territorial planning, environmental justice)? -e.g., we hypothesize that it is very important in rural areas in Amazon countries.
- ✓ **CS to educate youth in critical thinking for social change:** The field of Action Research (Investigación Acción) was adopted and expanded in several Latin American countries in the 1960s. Since then, how important, where and under which conditions, is it as a strategy for implementing CS in the region, enhancing public participation, enabling participating citizen scientists to determine the direction of his/her research, and/or fostering positive social and environmental changes?
- ✓ **CS to value the high diversity of types of knowledge in the region while reducing power inequalities among knowledge-bearers:** The concept of 'diálogo de saberes' (knowledge dialogues) emerged in several countries, in the pursuit of greater power equality between mainstream science & policy making, and indigenous, traditional and local peoples. What are the steps needed to pursue greater dialogue and in equal terms among mainstream scientists, policy makers and indiginenous, traditional and local peoples?

? What questions pop up for you after reading this poster? How do you interpret our findings differently? Do you have ideas to speed up data collection and analysis?

We want to hear from you!
Visit **http://cienciaparticipativa.net/documentos/mapeo**

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