



Consultative Group on International Agricultural Research
SCIENCE COUNCIL

**CGIAR Center Collaboration:
Report of a Survey**

SCIENCE COUNCIL SECRETARIAT

March 2006

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Lisa Sennerby Forsse

Chair

Science Council's Standing Panel on Mobilizing Science

Acronyms

APO	Asia, Pacific and Oceania, excluding developed countries
BAIF	Bharatiya Agro Industries Foundation, India
CARE	Private humanitarian organization, Belgium
CG	Same as CGIAR
CGIAR	Consultative Group on International Agricultural Research
CIAT	International Center for Tropical Agriculture (Centro Internacional de Agricultura Tropical)
CIFOR	Center for International Forestry Research
CIMMYT	International Maize and Wheat Improvement Center (Centro Internacional de Mejoramiento de Maíz y Trigo)
CIP	International Potato Center (Centro Internacional de la Papa)
CIRAD	Centre for International Cooperation in Agricultural Research for Development (Centre de coopération internationale en recherche agronomique pour le développement), France
CLAYUCA	Latin American and Caribbean Consortium to Support Cassava Research and Development (Consortio Latinoamericano y del Caribe de Apoyo a la Investigación y al Desarrollo de la Yuca) c/o CIAT, Colombia
CSIRO	Commonwealth Scientific and Industrial Research Organisation, Australia
CSO	Civil society organization
CWANA	Central and West Asia and North Africa
DEVO	Developmental organization
EST	Expressed Sequence Tags (technique used in molecular biology)
FAO	Food and Agriculture Organization of the United Nations
FLAR	Latin-American Fund for Irrigated Rice (Fondo Latinoamericano para Arroz de Riego), c/o CIAT, Colombia
GIS	Geographic information system
GO	Governmental organization
IARC	International agricultural research center
ICARDA	International Center for Agricultural Research in the Dry Areas
ICRAF	World Agroforestry Centre
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IFPRI	International Food Policy Research Institute
IITA	International Institute of Tropical Agriculture
ILRI	International Livestock Research Institute
INERA	National Institute for Agronomic Studies and Research (Institut de l'environnement et de recherches agricoles), based in Burkina Faso
INIBAP	International Network for the Improvement of Banana and Plantain (IPGRI), France
IPGRI	International Plant Genetic Resources Institute
IPK	Institute of Plant Genetics and Crop Plant Research (Institut für Pflanzengenetik und Kulturpflanzenforschung), Germany
IRD	International Relief and Development Inc., a private voluntary organization, USA
IRRI	International Rice Research Institute

IWMI	International Water Management Institute
JIRCAS	Japan International Research Center for Agricultural Sciences
KARI	Kenya Agricultural Research Institute
KUL	Catholic University of Louvain (Katholieke Universiteit Leuven), Belgium
LAC	Latin America and the Caribbean
MTP	Medium-term plan
N-AM	North America
NARO	National Agricultural Research Organisation, Uganda
NARI	National agricultural research institute in a developing country
N-APO	Developed country in Asia, Pacific and Oceania
N-ARI	Advanced agricultural research institute in a developed country
N-EUR	Northern Europe
NGO	Non-governmental organization
N-NGO	NGO from a developed country
N-university	University in a developed country
RO	Regional organization
S-APO	Developing country in Asia, Pacific and Oceania
SC	Science Council (CGIAR)
S-NGO	NGO from a developing country
SPMS	Standing Panel on Mobilizing Science (CGIAR Science Council)
SRO	Sub-regional organization
SSA	Sub-Saharan Africa
S-university	University in a developing country
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
WARDA	Africa Rice Center
WorldFish	World Fish Center
WWF	World Wildlife Fund for Nature

Summary

The Consultative Group on International Agricultural Research (CGIAR, or CG) Science Council's (SC's) Standing Panel on Mobilizing Science (SPMS) designed a survey consisting of two different questionnaires. The questionnaires, which aimed to assess ongoing global CG system collaborations with other organizations, were sent to the CGIAR Centers¹ in November 2004 and June 2005. The purpose of the first questionnaire was to paint a broad picture of the extent and nature of current external collaborations at the CG system level. The main purpose of the second questionnaire was to get a more profound understanding of the nature of key Center collaborations, by asking Centers to: i) identify the most important organizations with which they collaborate, in terms of scientific working relations; ii) describe the type of collaboration they have with these organizations; and iii) describe the extent and degree of activity in such collaborations. Fourteen Centers responded to the first questionnaire and 11 to the second.

The data obtained from the survey provided an initial overall picture of CG system collaborative efforts worldwide. One of the salient insights from survey responses was the high variability among the Centers in the number of collaborating organizations. This could be partly attributed to differences in Centers' collaboration strategies. However, most likely, this also reflects differences in the way that Centers collected the data, the thoroughness with which they gathered the information, as well as Centers' contrasting notions about what constitutes 'collaboration'.

The analysis suggests that the CG system collaborates actively with organizations located in developing countries: 78% of the organizations with which Centers collaborate are located in such countries, and over one third are in the Asia, Pacific and Oceania (APO) region. National agricultural research institutes in developing countries (NARIs), universities (S-universities), and non-governmental organizations (S-NGOs) in developing countries comprise about 60% of the organizations with which Centers collaborate.

The analysis indicates that while the typical collaborator is 'monogamous' (that is, it collaborates with only one of the Centers in the CG system), roughly 13% of collaborators interact with more than one Center. Indeed, the survey identified 24 organizations outside the CG system, each of which collaborates with at least half of the Centers.

Statistical analysis of all the collaborations reported in the survey reveals that the type of organization highly correlates with the number of Centers with which it collaborates. International agricultural research centers (IARCs), including the 15 CG system Centers and 20 organizations outside the CG system, collaborate with the most Centers, followed by universities in developed countries (N-universities), development organizations (DEVOs), NGOs in developed countries (N-NGOs), and advanced agricultural research institutes in developed countries (N-ARIs), irrespective of the region in which they are located. Notably, most instances of collaboration with IARCs are intra-CG system. All Centers mentioned collaboration with at least two other Centers, and typically, Centers collaborate with seven other Centers.

Further analysis of the collaborators' locations revealed that in some cases the region does correlate with the extent of collaboration in the CG system, regardless of the type of organization. For example,

¹ CGIAR Centers are referred to as 'Centers' throughout the rest of this document.

organizations in sub-Saharan Africa (SSA) and North America (N-AM) tend to collaborate with more Centers than those in Northern Europe (N-EUR) and developed countries in Asia, the Pacific and Oceania (N-APO), irrespective of the type of organization.

Survey results also challenge the widely held belief that collaboration with institutions in developed countries does not play an important role in the CG system. When Centers were asked to provide information on collaborations that are especially relevant, 57% of short-listed organizations were either N-universities, N-ARIs or N-NGOs. By contrast, the private sector was mentioned as a key collaborator only by four Centers, and participated in only 4% of the Centers' most relevant collaborations.

The various reasons for collaboration given by Centers can be summarized into the following six categories: i) providing access to critical expertise or material resources; ii) as a strategy for leveraging additional human resources; iii) facilitating testing and dissemination of information, technologies or policies; iv) taking advantage of collaborators' previous experience and/or presence in the field; v) to enhance the capacity of the Center's staff; and vi) enhancing funding prospects. Results show that access to additional expertise was by far the most frequently cited reason for relevant collaborations with N-ARIs and N-universities. In contrast, dissemination and testing was what most often motivated collaborations with NARIs and S-universities. Notably, results suggest that funding considerations have rarely motivated Centers' key collaborations, even when N-ARIs and N-universities are involved. Pairing Centers' survey responses with information on bilateral aid extracted from Centers' 2006–2008 Medium Term Plans (MTPs) suggests that, for most Centers, there does not appear to be a strong relationship between bilateral aid and collaboration with N-ARIs and N-universities located in donor countries.

While these results shed light on the extent and nature of collaboration in the CG system, they also suggest a series of questions that need to be addressed in order to improve the odds that such efforts are successful, and to guarantee that Centers' collaborations are aligned with the CGIAR's mandate and philosophy. The various actions that both the Centers and governance and advisory bodies at the CG system level are presently undertaking to address such questions should further encourage the mobilization of agricultural science for the poor, both within and outside the CG system.

I. Introduction

The SPMS was established in February 2004 to facilitate the role of the SC in enhancing and promoting the quality, relevance and impact of science in the CGIAR by intensifying the links between the research activities of Centers and global scientific capacity. In so doing, the SPMS should help mobilize the global scientific community around the mission of the CGIAR, and address the need for the CG system to understand better the totality of agricultural research around the globe, of which the CGIAR is only an estimated 4% on a budgetary basis.

A key task for the SPMS is to look for strategies and to identify opportunities to promote further collaboration of the Centers with leading scientific organizations, the private sector and civil society. It should also find means to enhance the quality of relevant science for the Centers, which should also help attract leading external scientists to additional collaborative activities with the CG system.

It is well known that there is extensive and productive collaboration between Centers and partners in the South. However, much less is known about their interaction with advanced research organizations and universities in the developed world. Furthermore, even though every Center keeps records of collaborations, and reports them by several means, including MTPs, to date an overall picture of collaborative efforts across the CG system has been lacking. As a first step towards assessing the need for, and improving, further Center interactions with external research and agricultural development organizations, the SPMS decided to paint this picture by conducting a survey of Centers' collaborations.

2. First Phase of the Survey

A first questionnaire was sent out to all Centers in November 2004. Responses to the questionnaire were received from 14 of the 15 Centers. Table 1 details the key information on various aspects of collaboration asked for in this questionnaire.

Table 1. Information requested in the first questionnaire

Collaborator	Major focus of the collaboration	Nature of collaboration (specific activity undertaken by collaborator)	Extent of collaborator's input	Time frame of collaboration
<ul style="list-style-type: none"> Name Type (NARI, N-ARI, etc.) Location (country) 	<ul style="list-style-type: none"> MTP project Logframe output (germplasm collection, germplasm improvement, sustainable production systems, policy, enhancing NARIs) 	Genomics, laboratory analysis, field testing, etc.	<ul style="list-style-type: none"> Person months per year or month in: 2002, 2003 and 2004 Estimated total financial contribution 	<ul style="list-style-type: none"> Date started Date of expected conclusion

A preliminary analysis of Center responses was presented at the third SC meeting conducted at the International Water Management Institute (IWMI), in Sri Lanka, on April 2005, and was sent by e-mail to all Center Directors for comments. Information was recorded in one central database. Organizations with which Centers reported collaboration were categorized by region and type.² The information provided by Centers' responses to the questionnaire painted a broad picture of the magnitude, spatial distribution and the key types of organizations with which the CG system collaborates.

2.1 Number of collaborators by location and type

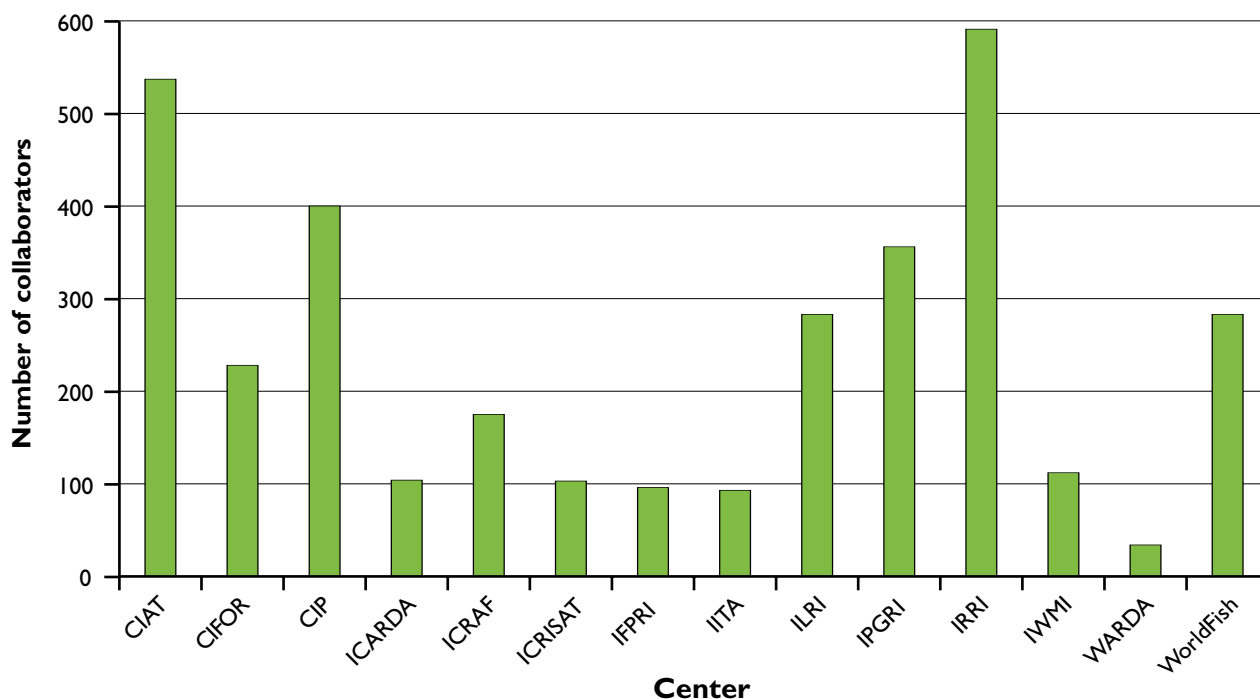
Centers reported 3395 organizations with which they collaborate. As shown in Figure 1, the total number of collaborators varied substantially from Center to Center – from 34 reported by WARDA to 591 by IRRI.³

Although the high variability in the number of collaborating organizations among the Centers suggested by these results can be partly attributed to differences in Centers' collaboration strategies, most likely it also reflects differences in the way in which Centers collected the data, the thoroughness with which they

² See the Appendix for information disaggregated by Center. The 15 CGIAR Centers are: International Center of Tropical Agriculture (CIAT), Center for International Forestry Research (CIFOR), International Maize and Wheat Improvement Center (CIMMYT), International Potato Center (CIP), International Center for Agricultural Research in the Dry Areas (ICARDA), World Agroforestry Centre (ICRAF), International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), International Food Policy Research Institute (IFPRI), International Institute of Tropical Agriculture (IITA), International Livestock Research Institute (ILRI), International Plant Genetic Resources Institute (IPGRI), International Rice Research Institute (IRRI), International Water Management Institute (IWMI), Africa Rice Center (WARDA), and the World Fish Center (WorldFish).

³ Care should be taken in interpreting these numbers as indicative of magnitude of Centers' collaborative efforts, especially because these numbers only count each collaborator once when mentioned by a Center, and therefore hide the fact that Centers often collaborate with a given organization on more than one project.

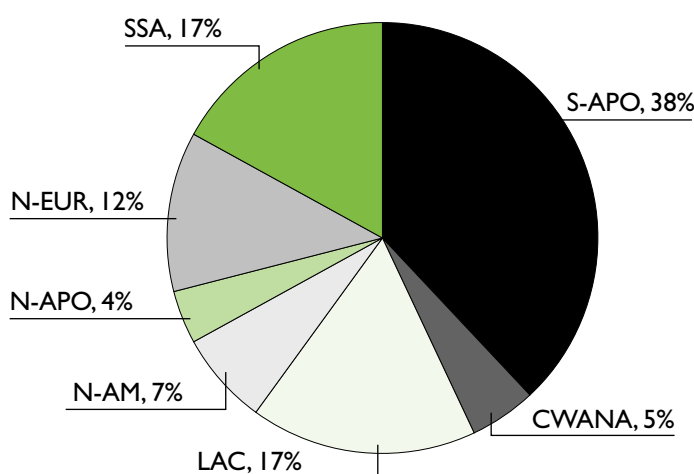
Figure 1. Total number of collaborators at the Center level



prepared the information⁴ and, most importantly, Centers’ contrasting notions about what constitutes ‘collaboration’.

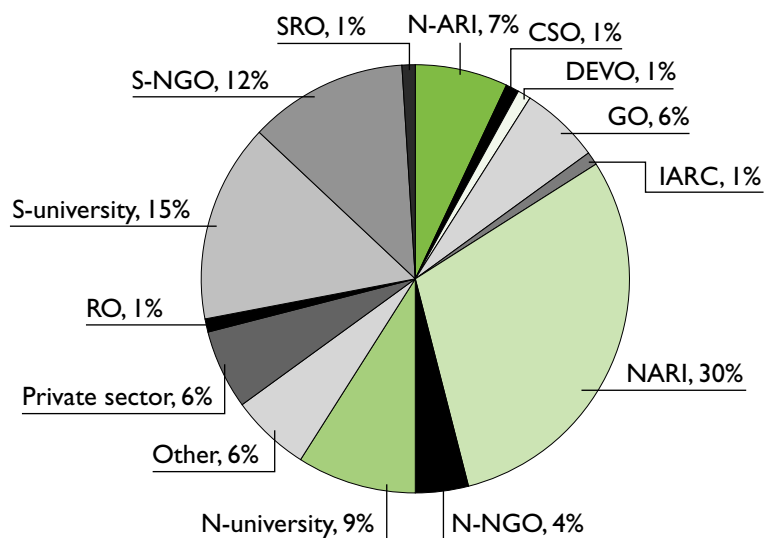
Figures 2 and 3 show the location and type of all the organizations mentioned as collaborators by all but one of the Centers. Therefore, they represent a good overall picture of CGIAR collaboration efforts worldwide.

Figure 2. Regional distribution of organizations with which the CG system collaborates (for abbreviations see acronym list)



⁴ For example, it was common to find in one Center’s response complete and thorough information about some MTP projects’ collaboration activities, but more limited information for others.

Figure 3. Types of organizations with which the CG system collaborates (for abbreviations see acronym list)



Figures 2 and 3 confirm that the CG system collaborates actively with organizations in developing countries: 78% of the organizations with which Centers collaborate are located in such countries, over one third in the APO region. NARIs, S-universities and S-NGOs comprise around 60% of the organizations with which Centers collaborate.

2.2 Who are the most frequent collaborators?

The majority of collaboration (87%) is ‘monogamous’, i.e. between one Center and one organization. There are, however, a number of organizations which collaborate with more than one Center, as shown in Table 2, which lists the 24 non-CG system organizations that collaborate with at least half of the Centers (ordered by the number of Centers that mentioned them as collaborators). If the number of Centers with which an organization collaborates is an indicator of that organization’s pervasiveness in the CG system, and perhaps of its potential for further and stronger participation with the CG system, this data suggests that the highest potential lies in N-ARIs and N- and S-universities located in N-EUR, SSA and N-AM.

But can the pattern in Table 2 be generalized? In other words, do the type of organization and the region in which it is located determine its pervasiveness in the CG system? The answer is “yes, roughly”.

Statistical analysis⁵ of all the references to organizations in the first questionnaire allowed us to separate the influence that the ‘type’ of organization has on its pervasiveness in the CG system, from the influence of that organization’s location. The results suggest that the type of organization highly correlates with the number of Centers with which it collaborates, irrespective of where it is located. IARCs mentioned as collaborators in the survey tend to collaborate more pervasively in the CG system than other types of organizations. Furthermore, the analysis suggests that the prevalence of IARCs in the CG system is mainly explained by intra-CG system collaboration. Ranked in descending order, the IARCs are followed by

⁵ Using Ordinary Least Squares (OLS) algorithm with Stata 8.0, we ran a linear multivariate regression in which the number of CG Centers with which organizations collaborate was regressed against the organization’s type and region. Centers were included as IARCs in the dataset.

Table 2. Non-CG system organizations that collaborate with at least half of the Centers (from information provided by 14 of the 15 Centers)

Organization	Number of CGIAR Centers with which there is collaboration	Type of organization	Region
FAO	14	DEVO	Global
Wageningen University, The Netherlands	13	N-university	N-EUR
CARE, Belgium	12	N-NGO	N-EUR
CIRAD, France	10	N-ARI	N-EUR
Makerere University, Uganda	10	S-university	SSA
NARO, Uganda	10	NARI	SSA
Cornell University, USA	9	N-university	N-AM
INERA, Burkina Faso	9	N-ARI	SSA
Sokoine University of Agriculture, Tanzania	9	S-university	SSA
University of California, USA	9	N-university	N-AM
University of Nairobi, Kenya	9	S-university	SSA
Natural Resources Institute, UK	9	N-ARI	N-EUR
CSIRO, Australia	8	N-ARI	N-APO
Michigan State University, USA	8	N-university	N-AM
USDA, USA	8	N-ARI	N-AM
WWF	8	N-NGO	Global
KUL, Belgium	7	N-university	N-EUR
KARI, Kenya	7	NARI	SSA
Purdue University, USA	7	N-university	N-AM
University of Hanover, Germany	7	N-university	N-EUR
University of Hohenheim, Germany	7	N-university	N-EUR
University of Yaoundé, Cameroon	7	S-university	SSA
University of Zimbabwe	7	S-university	SSA
Jomo Kenyatta University of Agriculture and Technology, Kenya	7	S-university	SSA

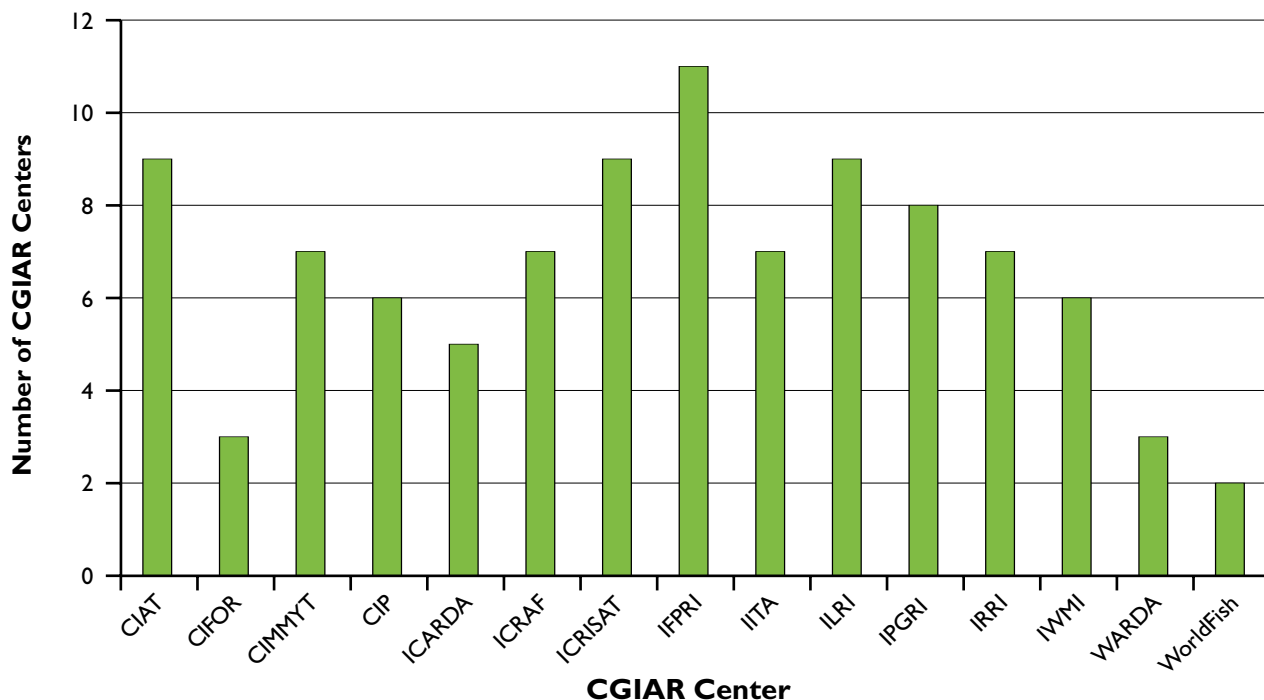
N-universities, DEVOs, N-NGOs, N-ARIs, S-universities, regional organizations (ROs), NARIs, governmental organizations (GOs) different from NARIs, civil society organizations (CSOs), S-NGOs, and lastly, by private sector organizations and SROs.

Similar analysis of collaborators' locations revealed that only in some cases does location explain variations in the number of Centers with which an organization collaborates. Locations in N-EUR, SSA, N-AM and N-APO all explain variations in the number of Centers with which collaboration exists. Regardless of their type, organizations located in SSA and N-AM tend to collaborate with more Centers than those in N-EUR and N-APO.

2.3 How important is collaboration among Centers?

As mentioned above, responses to the first questionnaire indicate that there is significant collaboration among Centers. All Centers mentioned collaboration with at least two others, and the typical Center collaborates with seven other Centers (Figure 4). IFPRI was the Center mentioned most often as a collaborator, followed by CIAT, ICRISAT and ILRI.

Figure 4. Collaboration between Centers



Further analysis of information provided by Centers in the first questionnaire was not possible, due to the high heterogeneity in the way in which Centers presented the information, even for different projects or themes within a given Center. More specifically, Centers differed in: i) their criteria for defining the ‘type’ under which a given organization should be categorized; ii) the unit of collaboration (organization, division, department, project office, individuals); iii) the level of aggregation of information (theme, project, activity, task); and iv) the completeness of information. Thus, a second questionnaire was sent to all Centers in June 2005, with a focus on questions regarding the nature of Centers’ collaboration efforts. The questionnaire intended to determine which kinds of collaborative efforts are most relevant to Centers, and to identify the activities and the benefits involved in such efforts. Centers were asked to identify the five to ten most important collaborations, in terms of their strategic value to the Center. For each of these, Centers were asked to provide a couple of sentences describing the characteristics that made such collaborations especially relevant, in terms of increasing the effectiveness of the Center in achieving its goals. Because we know less about the nature of scientific and research oriented collaborations at the CG system level, Centers were asked to focus their response on such kinds of interactions.

3. Second Phase of the Survey

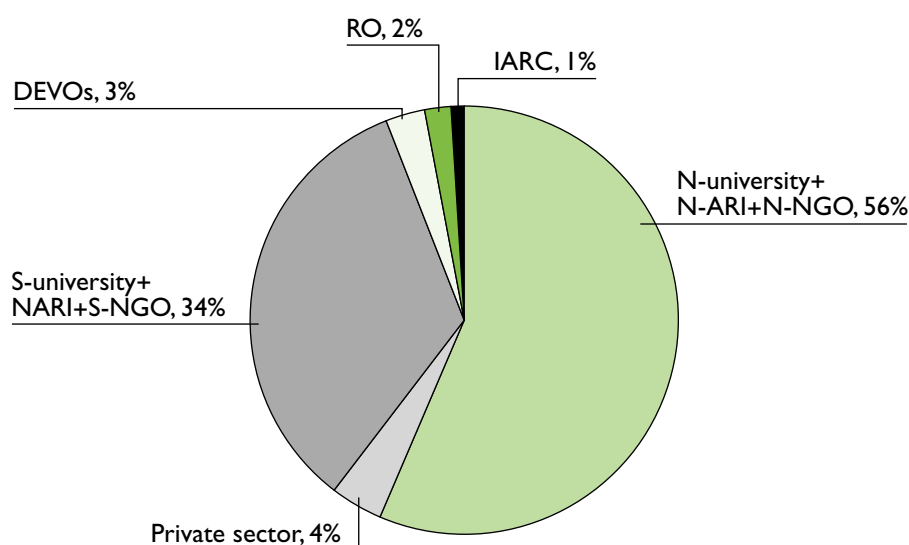
The information provided by the 11 Centers that responded to the second questionnaire, again reflects the lack of a common definition of ‘collaboration’ and of more formal interactions, such as ‘partnerships’, in the CG system. Whether typologies of the different kinds of interactions according to the different activities, contributions and expected benefits of the parties involved would help clarify the nature of collaboration in the CG system remains a matter to be discussed.

3.1 Characteristics of the most relevant collaborators

On average, the Centers identified only 6% of the organizations that collaborate with the CG system as highly relevant collaborators. Notable exceptions were N-ARIs and N-universities, for which Centers selected 22% of those that interact with them as highly relevant collaborators. This suggests relatively higher odds of relevancy in CG system collaborative efforts with such organizations. In contrast, Centers selected only 3% of private sector organizations that interact with them as highly relevant collaborators.

Figure 5 shows the share of highly relevant collaborations that different types of organizations have. Challenging the widely held belief that collaboration with organizations in the North does not play an important role in the CG system, the data provided by the Centers shows that 57% of the organizations involved in their most relevant collaborations are N-universities (32%), N-ARIs (23%) and N-NGOs (2%). Interestingly, private-sector organizations represent only a small share of Centers’ highly relevant collaborations. Furthermore, the only two highly relevant collaborations with IARCs involved other Centers. Lastly, it is worth noting that Centers did not mention CSOs, SROs and GOs (other than NARIs), as their most relevant collaborators.

Figure 5. Most important collaborators by type of organization (for abbreviations see acronym list)



3.2 Reasons for collaboration

Some factors are particularly important in the process of initiating collaboration. Shared mandates or shared research interests between the Center and the partner organization, the possibility of establishing long-standing partnerships, and the partner's recognized competence were cited frequently as valuable attributes when choosing a collaborator. This was especially the case for several N-ARIs and N-universities that figured repeatedly in the most important collaborators short-lists. The Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), the Japan International Research Center for Agricultural Sciences (JIRCAS), and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) were short-listed by 5, 3 and 3 Centers, respectively (Table 3). Wageningen University and the Catholic University of Louvain (KUL) were short-listed by 6 and 4 Centers, respectively (Table 4).

Table 3. N-ARIs most cited as key collaborators, and the reasons for collaboration

N-ARI	CGIAR Center	Reasons for collaboration
Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD)	CIFOR	Strong, long-standing partnership; complementarities in research teams and research locations; access to funds (joint proposals); and shared goals and vision. Joint staff appointments.
	IPGRI	Access to disciplinary expertise, use of laboratory protocols developed by CIRAD. Collaboration in several projects, one of them coordinated by a CIRAD scientist on secondment.
	ICARDA	Access to disciplinary expertise (pastoralist systems).
	CIAT	Long-standing partnership. Its scientists have collaborated in such diverse areas as genetic material collections of wild species, bio-fortification of the species, through to the determination of the rice genome.
	IRRI	Collaboration in several projects and in diverse areas (e.g. genetic mapping, development of public access databases and mountain agrarian systems).
Japan International Research Center for Agricultural Sciences (JIRCAS)	ICARDA	Access to disciplinary expertise and material resources (genes).
	CIAT	Long-standing partnership, access to disciplinary expertise and scientists on secondment.
	ICRISAT	Financial support for joint projects, upstream scientific support and critical research materials.
Commonwealth Scientific and Industrial Research Organisation (CSIRO)	IWMI	Developed a wide range of expertise in all aspects of water management for agriculture. Contributes with groundwater expertise to IWMI's projects.
	CIAT	Constant and long-standing partnership that has been key to setting up research lines such as tropical forages. The forages group has always had a source of germplasm and related information in CSIRO.
	IRRI	Exchange of knowledge and access to expertise and facilities. Collaboration in several projects.

Table 4. N-universities most cited as key collaborators, and the reasons for collaboration

N-UNIVERSITY	CGIAR Center	Reasons for collaboration
University of Wageningen	CIAT	Long-standing relationship (at least 30 years), through exchange of faculty, scientists and students, from both developed and developing countries.
	CIFOR	Exchange of research findings, staff, ideas, etc. Joint project on co-management of natural resources.
	CIMMYT	Access to technologies and methodologies on global custodianship, characterization and management of the genetic resources of maize, wheat and related species.
	CIP	Soils related research and links to trade-off modelling. Work conducted in the Andes and SSA with MSc and PhD students.
	IFPRI	Management of joint research program, Food Security and Sustainable Land Use in Less-Favoured Areas. PhD students from the South are trained at the university and participate in field research in the South.
	IPGRI	Development of search methodologies and tools (including molecular approaches, computer image analysis, as well as an improved use of statistics and mathematics) to identify useful traits within conserved germplasm. Provision of staff and office space for project on genetic resources policy. Capacity building in the South on genetic resources management.
Catholic University of Louvain (KUL)	CIP	Knowledge sharing for potential application of cryopreservation to potato, sweet potato and other tuber crops. Establishment of a network on cryopreservation. Advanced training on ex situ conservation (cryopreservation).
	ICRISAT	Long-standing collaboration on virus dynamics and detection tools needed to avoid the spreading of the virus through hosts such as groundnut and millet seed, especially on Peanut Clump Virus (in the Sahel). Development of decision-support models for improved agricultural management of dryland cropping systems. Capacity building in remote sensing/ geographic information systems (GIS).
	IITA	Long-standing collaboration. Access to scientific know-how and advanced laboratory equipment for research on integrated soil fertility management and biotechnology (use of molecular markers in breeding activities and in genetic transformation).
	IPGRI	Technologies for effective conservation of genetic diversity of banana and plantain (Musa), and for its characterization and use. KUL hosts a state-of-the-art in vitro Musa gene bank and the International Network for the Improvement of Banana and Plantain (INIBAP).

Collaborators typically play multiple roles, and Centers provided several and diverse reasons for collaboration with each particular partner. In an effort to give a sense of the main reasons driving collaboration, responses were grouped into six broad categories, that are described below:

Providing access to disciplinary expertise or material resources

a) Disciplinary expertise

This includes receiving advice and input from specialists or leading research teams on a specific subject, or drawing on information from ongoing research projects that are complementary to the in-house projects, i.e. share common objectives but look at different aspects of the problem. Livelihood economics, food legume improvement, small ruminant market analysis, groundwater management, plant stress physiology, barley pathogen variability, remote sensing/spatial analysis and human nutrition are some examples of the areas of expertise for which Centers turn to partners for assistance. However, since the area of expertise was not always specified in Centers' responses it was difficult to determine or rank the specific areas in which Centers needed external input.

b) Material resources

Land, research, conference and workshop facilities, vehicles and advanced laboratory equipment are some of the material resources provided by collaborators. A recurrent example is the case where a national agricultural institute hosts a CGIAR regional or project office, or provides land for field trials. This also includes access to gene bank collections and sources of genetic diversity (e.g. stress tolerance genes, seeds, genetic markers, etc.). ICARDA for example explains that Institute of Plant Genetics and Crop Plant Research (IPK), based in Germany has one of the world's most productive plant Expressed Sequence Tags (EST) sequencing and bioinformatics facilities, and is able to provide the markers and tools required for the project in which they collaborate.

Strategy for leveraging additional human resources

Staff secondment (the detachment of staff from their regular organization for temporary assignment elsewhere) and joint appointments are frequent strategies to boost the Centers' staff capacity. An example of this is found in the CIRAD–CIFOR partnership where there are currently two joint staff members (i.e. costs are shared between the two institutions) – one based in France and the other based in Indonesia. Student co-supervision is also a common practice. Graduate students from both South and North organizations play an active role in partnerships, collecting primary data and conducting dissertations in research locations or in topics of interest to the Centers.

Facilitating testing and dissemination of information, technologies or policies

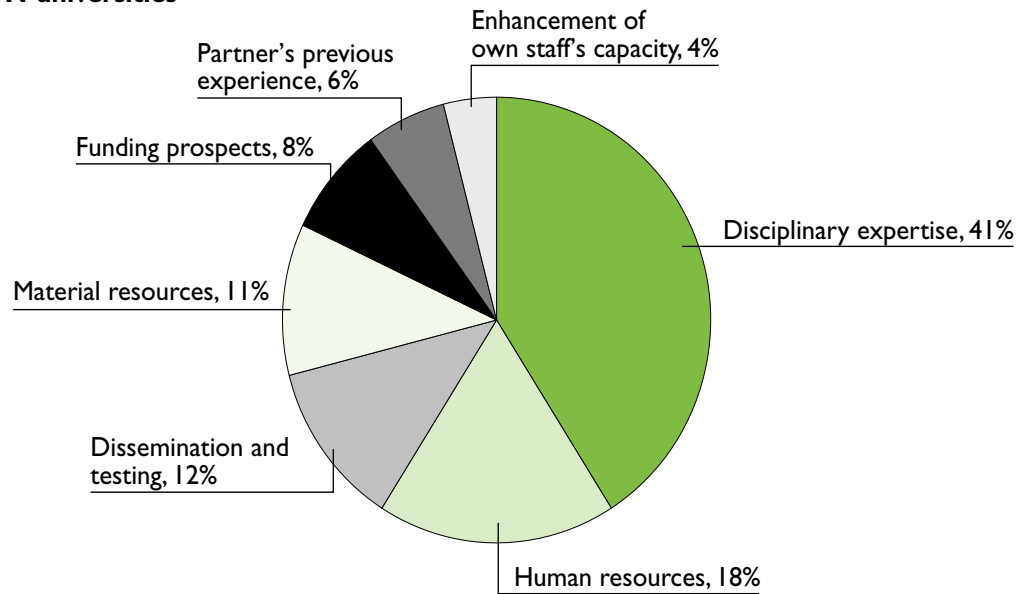
This includes training activities and dissemination of information, technologies and enhanced crop varieties. Collaboration in testing and dissemination of information, technologies or policies accounts for nearly 40% of the reasons given for collaborating with partners in developing countries. Figure 6 shows this marked proportion.

Many examples of this type of collaboration are found in the Centers' responses. ICRISAT for instance explains that the BAIF Development Research Foundation's very wide network throughout rural India and expertise in the area of social mobilization and collective action promotion has helped the Center to scale up its improved technologies to a very large number of farmers, resulting in greater visible attributable

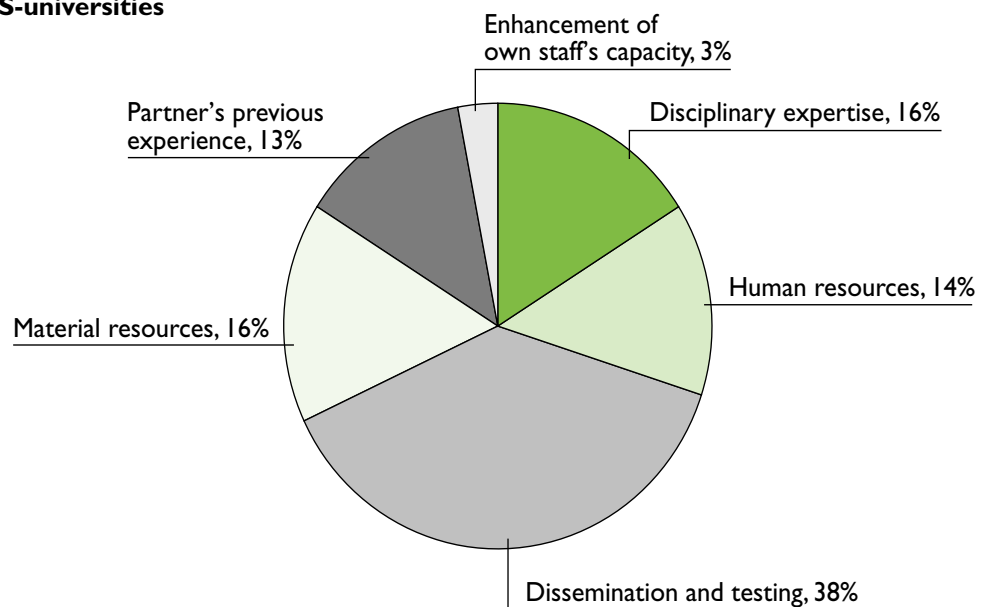
impact. ICRAF affirms that collaboration activities with NARIs in Africa, Latin America, South and Southeast Asia serves to scale up and increase the impact of agroforestry through including agroforestry practices and science in agriculture extension. An example of this is that ICRAF has been able to increase yields for about 400 thousand farmers, through collaboration with NARIs in East and Southern Africa.

Figure 6. Reasons for Center collaboration with N-ARIs and N-universities, and with NARIs and S-universities

N-ARIs and N-universities



NARIs and S-universities



Taking advantage of collaborators' previous experience and/or presence in the field

This includes contacts, identification of local needs, years of experience in a research area, etc. Access to another organization's contacts on the research area, region or country can facilitate dialogue with national policy makers, other NARIs, local NGOs, farmer and civil society groups. IWMI, for example states that collaboration with International Relief and Development Inc. (IRD), a US-based NGO, has strengthened its links with French research organizations, especially in West Africa where they are most active. Due to its active work and contacts in the region, collaboration with IRD has allowed IWMI to conduct real world field experiments with national organizations and students. Collaboration between CIFOR and People and Plants International is another example since, according to CIFOR, this collaboration not only provides access to an extensive network of researchers and practitioners in advanced organizations but also provides links that enable CIFOR to work actively on the policy front in Brazil and Cameroon. Access to data from past studies is another advantage of collaboration with others with previous experience in the research area.

Enhancing the capacity of the Center's staff

Training provided to the Center's staff by another organization's staff or in their research facilities is a frequent reason for collaboration. This training can be formal (through supervision of post-doctoral fellows, short technical courses, etc.) or informal (Center staff doing short stays at the partner organization). One example is the IPK–ICARDA example used previously, since IPK also provides training in its facilities for ICARDA staff members involved in the project.

Enhancing funding prospects

Joint fund raising activities, joint proposals, linkage funds programs and shared funds for specific projects are some examples of the way partnerships can enhance funding prospects.

Figure 6 shows the share for each of the reasons for collaboration described above; with N-ARIs and N-universities on the one hand, and with the NARIs and S-universities on the other hand. Access to additional expertise was, by far, the key reason for the highly relevant collaborations with N-ARIs and N-universities. In contrast, dissemination and testing was what motivated key collaborations with NARIs and S-universities. Notably, Figure 6 seems to suggest that funding considerations have rarely motivated Centers' key collaborations, even when N-ARIs and N-universities are involved.

3.3 Bilateral aid and collaboration with organizations in the North

To dig a bit deeper in the relation between bilateral aid and collaboration with organizations in the North the lists of highly relevant partners were contrasted with the information on bilateral aid extracted from the funding details of the 2006–2008 MTPs (Tables 5–7). For 11 out of the 13 Centers, there does not appear to be a strong relationship between bilateral aid and collaboration with N-ARIs and N-universities. The case of ICRISAT serves as a good example of the situation in the other 10 Centers that responded. ICRISAT provided a list of 13 most important collaborators including N-ARIs (2), N-universities (3), NARIs (5), one S-university, one DEVO and one partner from the private sector. Only in one case is the partner organization located in the same country as one of the major donors for ICRISAT.

Table 5. ICRISAT's major donors (bilateral aid) and collaboration with N-ARIs and N-universities from those countries (funding estimated for 2005 and extracted from the 2006–2008 MTP)

Country	Unrestricted contributions (US\$ millions)	Restricted contributions (US\$ millions)	Number of N-ARIs and N-universities
United States	2.269	2.897	1
United Kingdom	1.817	1.314	0
Norway	1.099	0.008	0
Canada	0.947	1.116	0

In the case of IRRI and ICARDA, the relationship between funding and collaboration seems to be somewhat stronger. IRRI's list of most important collaborators is composed of 17 organizations of which 11 are N-ARIs and N-universities. Over half of the latter are located in three of IRRI's major donor countries. ICARDA, on the other hand, provided a list of 14 most important collaborators, of which 13 belong to the N-ARI and N-university categories, five of them located in major donor countries. In both cases, the strongest collaboration is with organizations in the United States, and collaboration with the universities in that country is established through United States Agency for International Development (USAID) Linkage Funds.

Table 6. IRRI's major donors (bilateral aid) and key collaboration with N-ARIs and N-universities from those countries (funding estimated for 2005 and extracted from the 2006–2008 MTP)

Country	Unrestricted contributions (US\$ millions)	Restricted contributions (US\$ millions)	Number of N-ARIs and N-universities
United States	3.450	0.630	4
Japan	2.650	1.180	2
Switzerland	0.040	1.660	0
United Kingdom	2.080	0.300	1

Table 7. ICARDA's major donors (bilateral aid) and collaboration with N-ARIs and N-universities from those countries (funding estimated for 2005 and extracted from the 2006–2008 MTP)

Country	Unrestricted contributions (US\$ millions)	Restricted contributions (US\$ millions)	Number of N-ARIs and N-universities
United Kingdom	1.469	1.675	1
United States	1.380	0.419	4
The Netherlands	1.128	0	0

3.4 Collaboration with the private sector

Four Centers (CIAT, CIMMYT, ICRISAT and IRRI) referred to the private sector as a highly relevant collaborator. Both ICRISAT and IRRI referred to private biotechnology service providers. ICRISAT reported that collaboration with Technoserve in a project to raise farmers' income by using profitable grain legumes and better links to markets has led to a stimulation of the business activity along the supply chain. IRRI reported that it collaborates with Perlegen Science Inc. to identify sequence variation of major rice strains. CIMMYT reported collaborating with several private seed companies to develop and disseminate drought-tolerant, open-pollinated maize varieties. Finally, CIAT considered that three of their collaborations with the private sector in Latin America deserved special attention because of their potential for becoming relevant or strategic alliances in the future: an association of rice producers, the Latin-American Fund for Irrigated Rice (FLAR); an association of cassava producers, the Latin-American and Caribbean Consortium to Support Cassava Research and Development (CLAYUCA); and an alliance with a private company, Papalotla, to develop new grass varieties.

4. Conclusions

The survey created a pool of useful information on CGIAR collaborations. As a result, we are now more aware of the fact that Centers have contrasting notions about what exactly constitutes ‘collaboration’. Indeed, the data provided by the Centers suggests there is a need to think of a typology of Centers’ collaborations that spans the whole range of existing interactions, from those that are highly informal or short-lived, to those that involve long-lasting, formal partnerships with detailed contractual arrangements.

More is now known about collaboration in the CGIAR, in terms of the number, location and type of organizations with which Centers and the CG system as a whole interact. An important number of collaborators interact with more than one Center, and many have a pervasive presence in the CG system; perhaps suggesting their potential as key external partners. We have also confirmed that there is significant collaboration between Centers, and that Centers are often short-listed as key collaborators by others in the CG system.

The survey has enabled a better grasp of the reasons for collaboration and a better understanding of how collaborations contribute to CG successful performance. For example, although survey results corroborate the notion that the CG system interacts actively with organizations in developing countries, they also indicate that the relatively few collaborations with the North, especially with N-ARIs and universities, are often considered by the Centers as highly relevant, because they provide access to critical, complementary disciplinary expertise and material resources. Interestingly, results reveal that funding considerations have rarely motivated Centers’ key collaborations, even with N-ARIs and N-universities. For most Centers, collaboration with such organizations is not clearly correlated with bilateral aid from the countries where such organizations are located.

Private sector collaborators are still rare in the CG system, and are seldom short-listed by Centers as highly relevant. Given the sector’s key role in agricultural research, this lesson supports the increasingly widespread conviction that CG system–private sector partnerships constitute an opportunity that needs to be tapped, and that important steps need to be taken on this front.

The survey has highlighted the broad range of organizations with which Centers collaborate, and confirmed that interactions within the CG system and outside of it are an integral part of Centers’ activities. While these results shed light on the extent and nature of collaboration in the CG system, they also motivate a series of questions that need to be addressed in order to improve the chances of success of such efforts, and guarantee that they are aligned with the CGIAR’s mandate and philosophy. Some of these are:

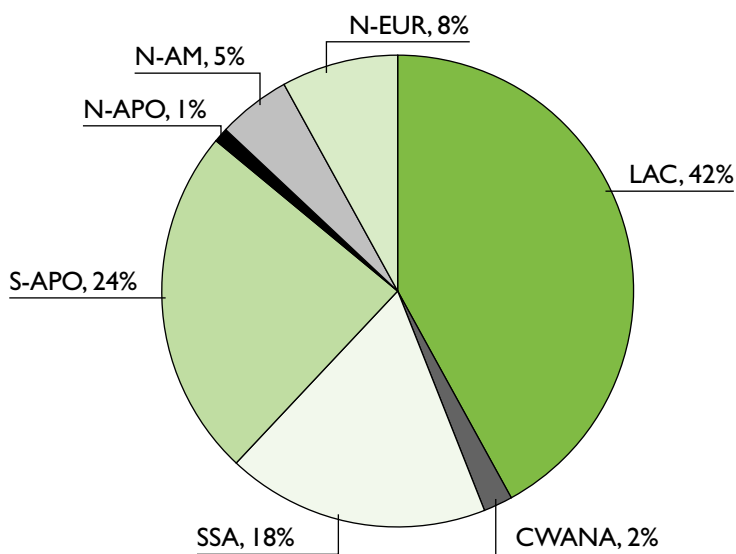
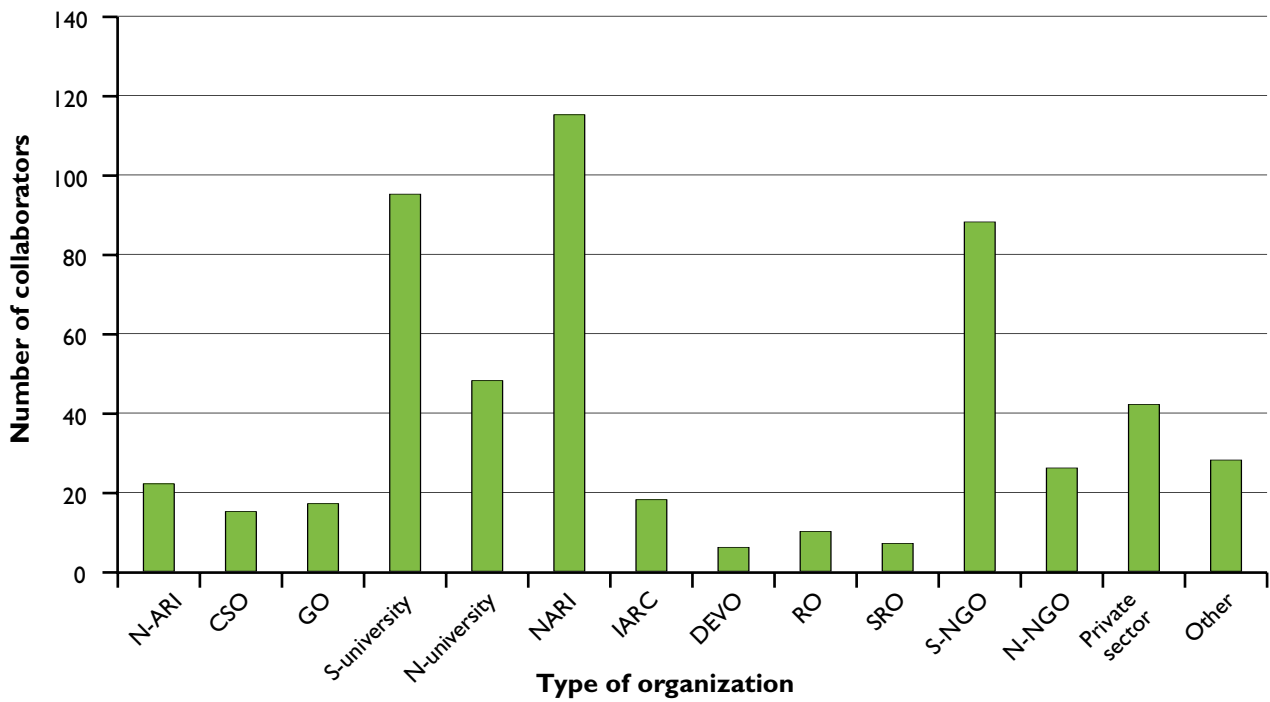
- To what extent have collaborations identified by the survey contributed to mobilizing science in the CGIAR?
- How can partnerships that contribute to mobilizing science be further encouraged in the future?
- Which areas and methods of research in the CG system are more amenable to (or in need of) partnerships or other kinds of collaboration?
- What incentives are actually driving organizations to pursue collaboration with the Centers?
- What role do complementarities in comparative advantage play in such collaborative efforts?
- How is bilateral aid influencing the choice of collaborators?
- What mechanisms and modalities of collaboration are most appropriate for the CGIAR’s mandate and philosophy?

- Under what circumstances should collaboration be formalized into partnerships?
- What are the key elements that make different kinds of collaborations work under specific circumstances, and are there elements that make collaborations consistently less effective?
- What kinds of collaboration are most likely to generate benefits that fully justify the transaction costs involved?

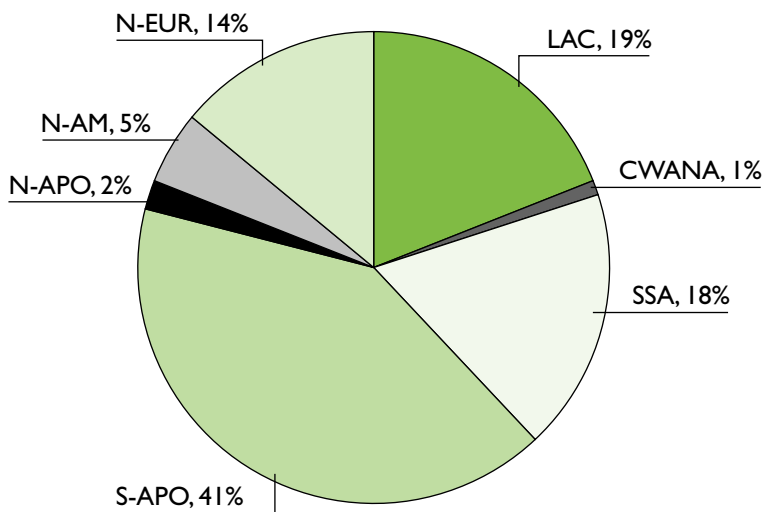
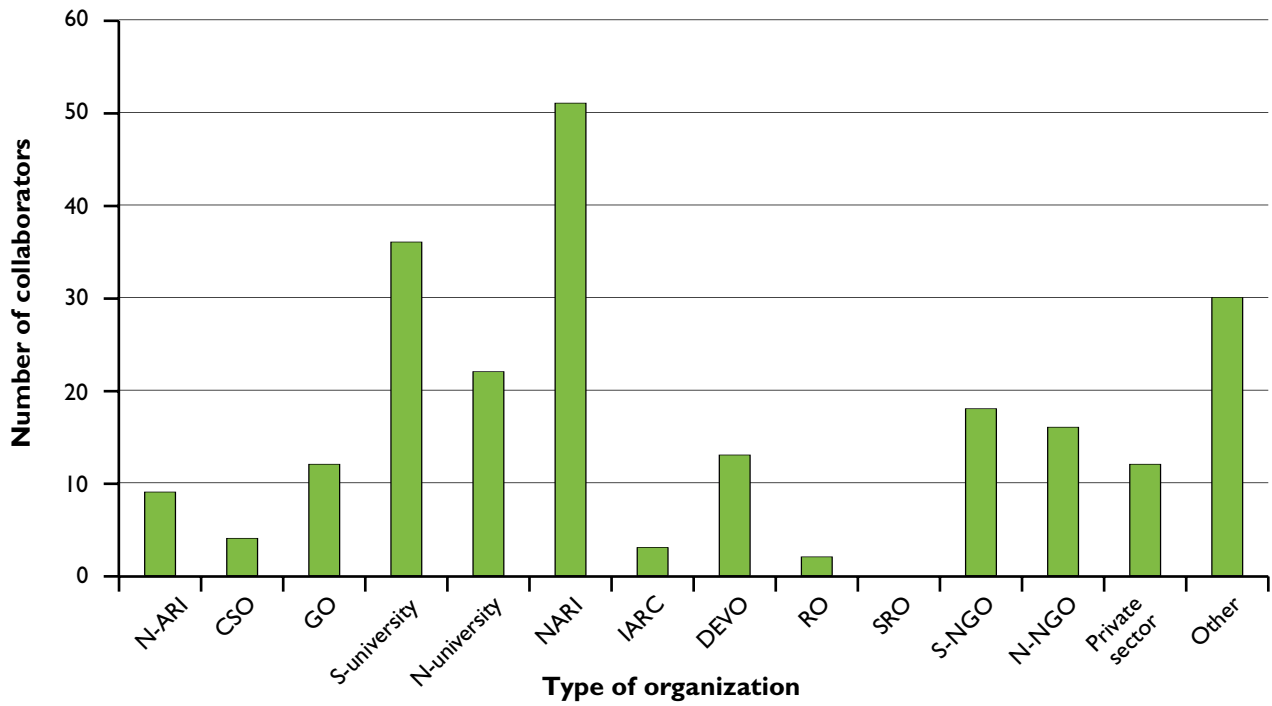
The various actions that both the Centers and governance and advisory bodies at the CG system level are presently undertaking to address such questions should further encourage the mobilization of agricultural science for the poor within and outside the CG system.

Appendix: Data on Collaboration, Disaggregated by Center

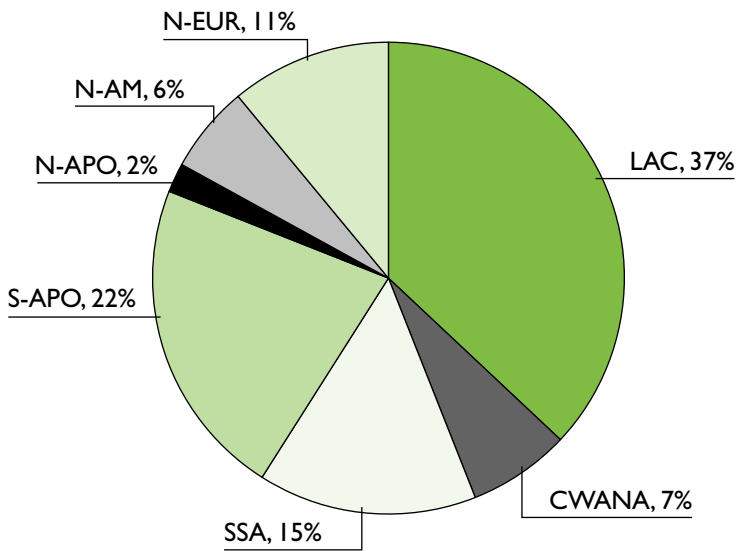
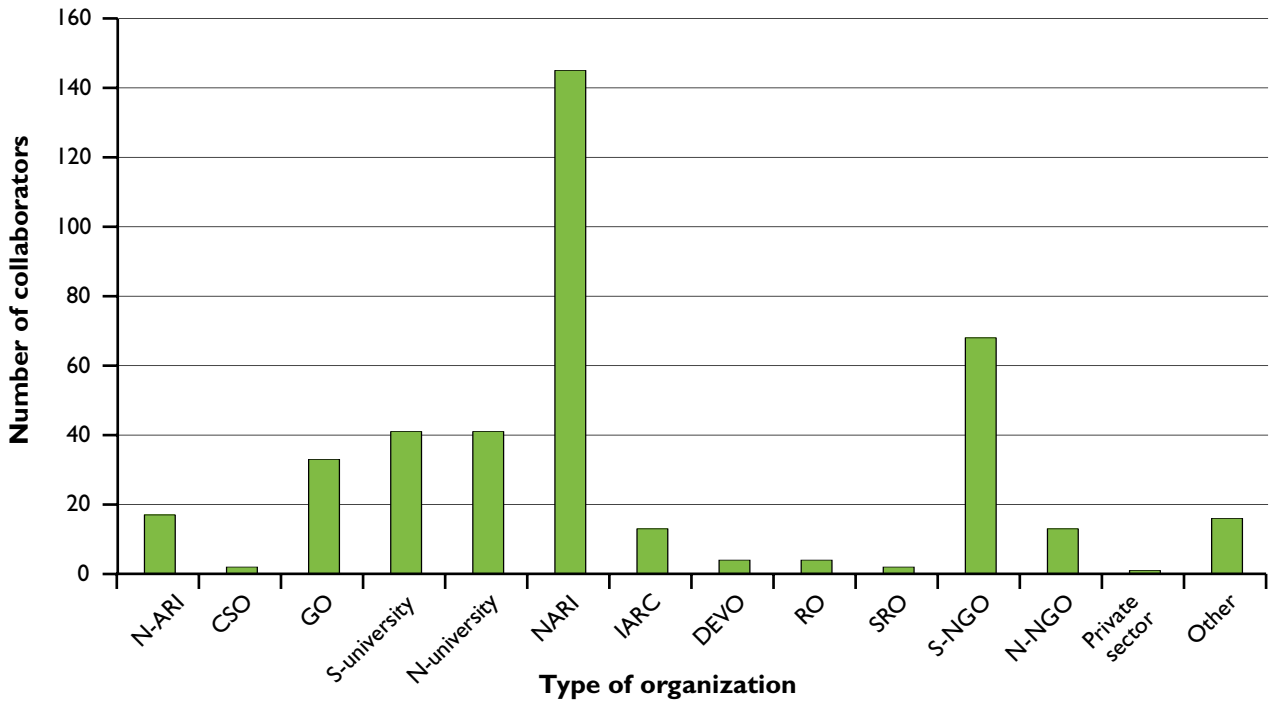
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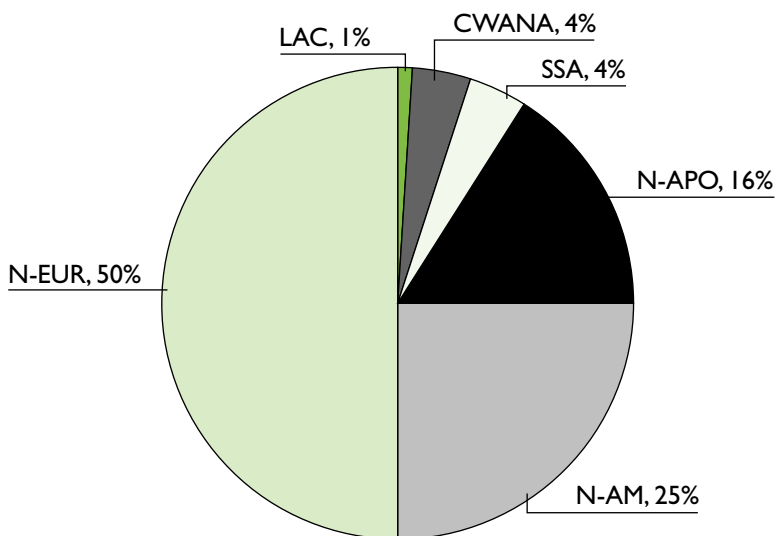
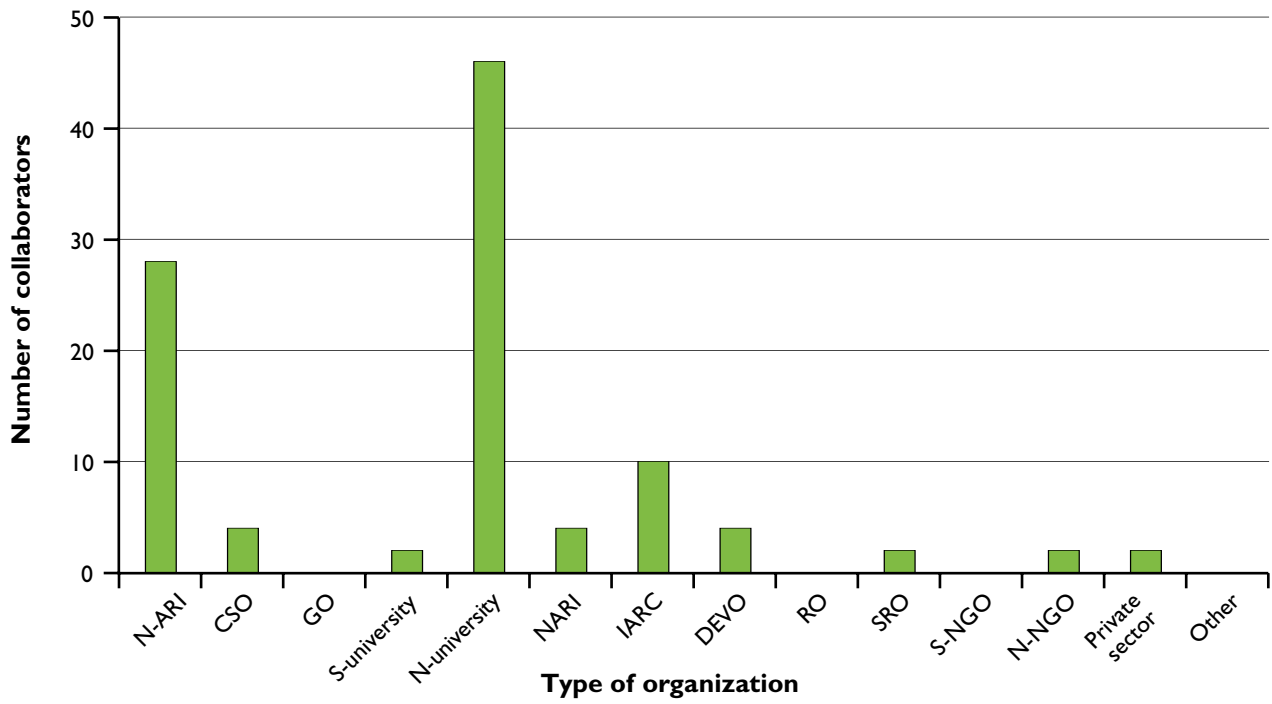
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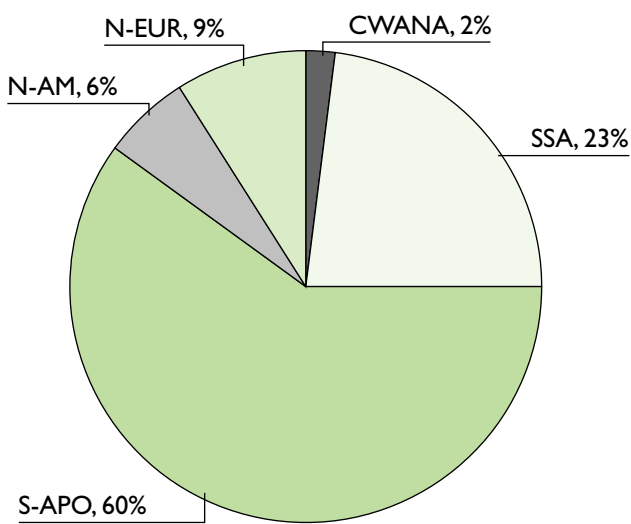
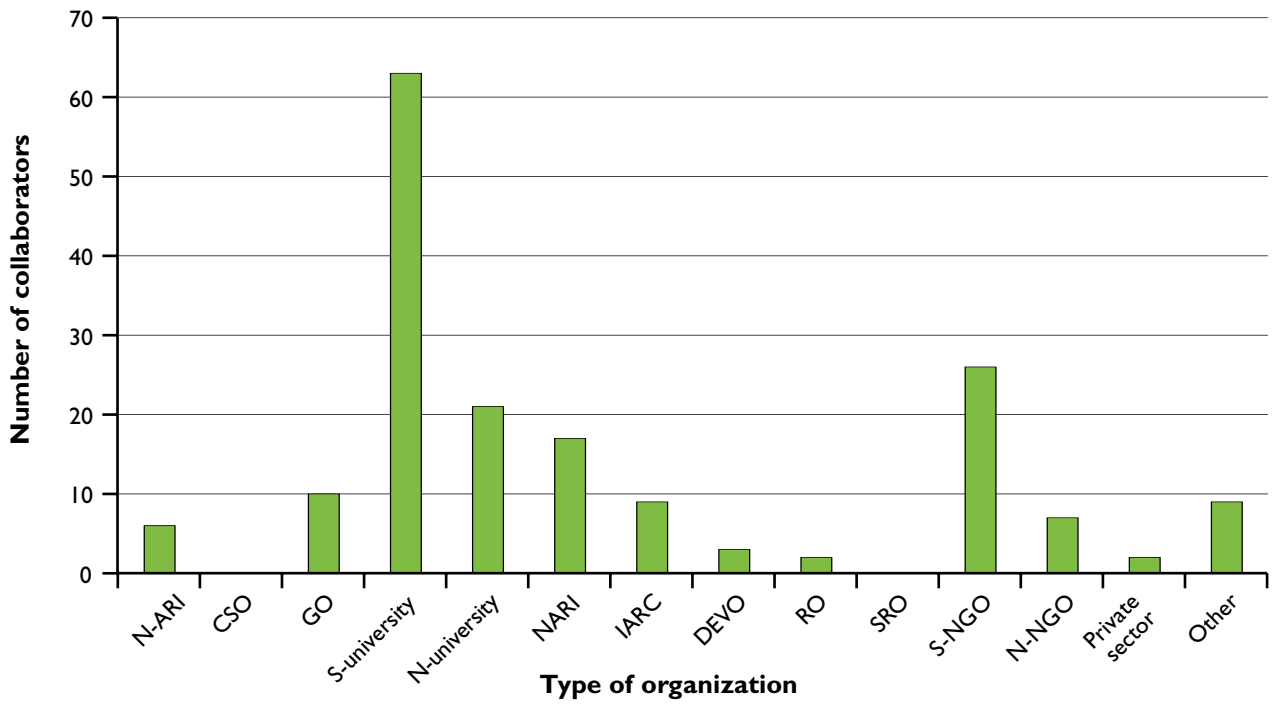
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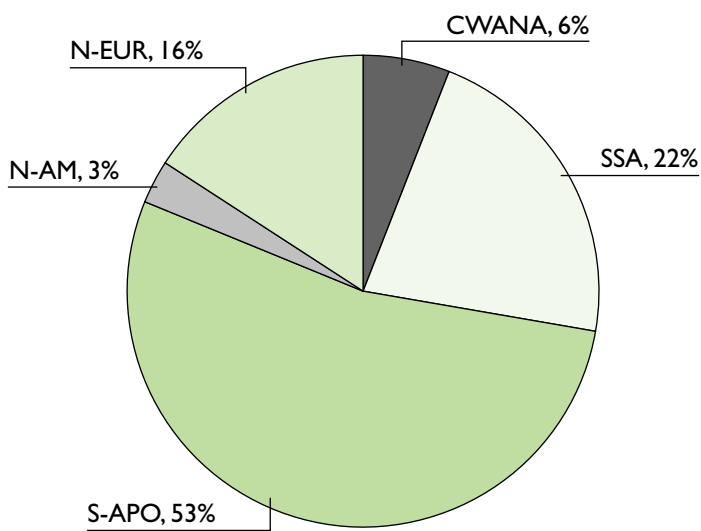
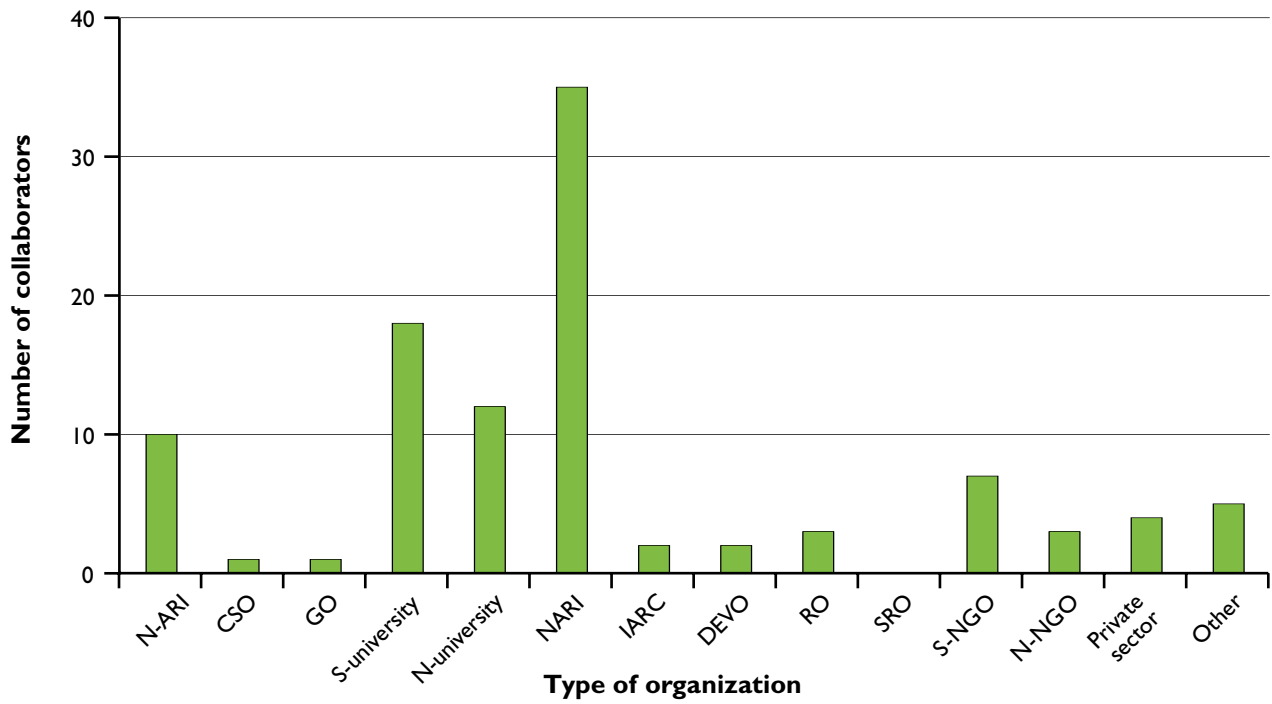
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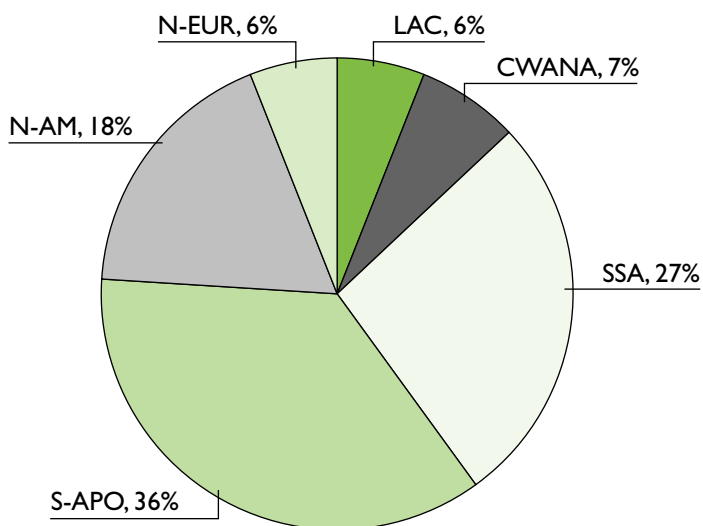
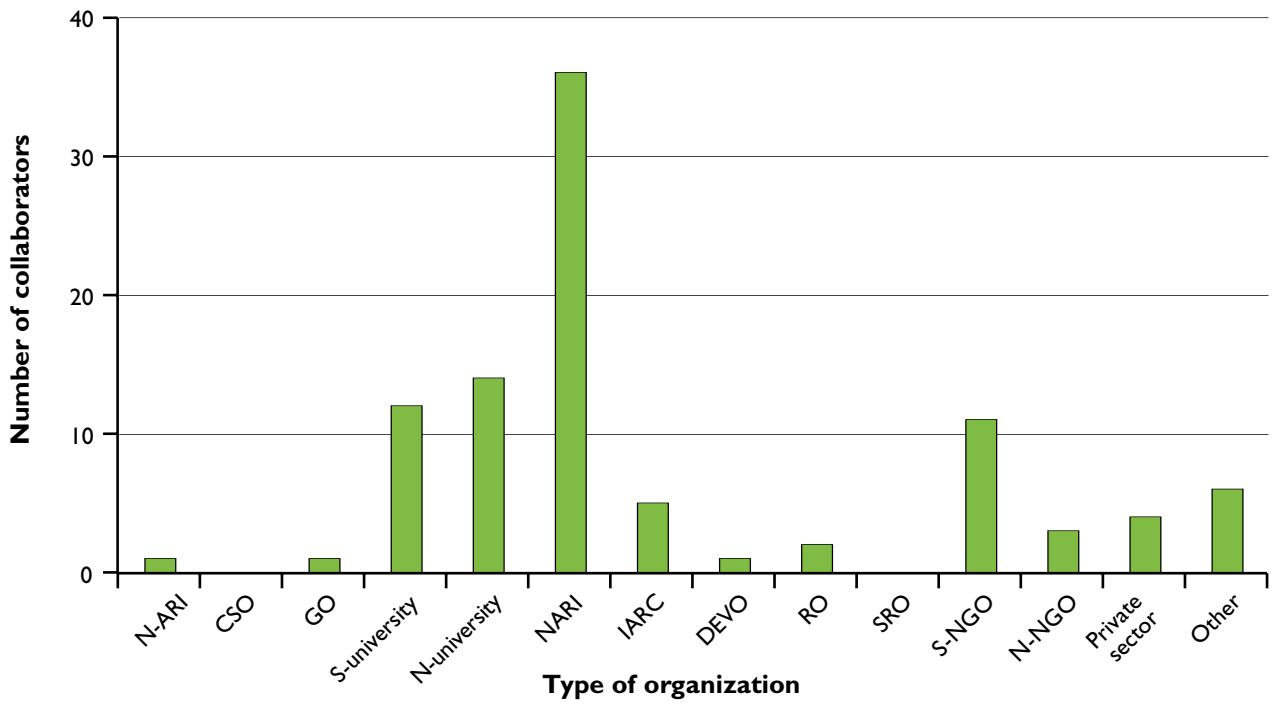
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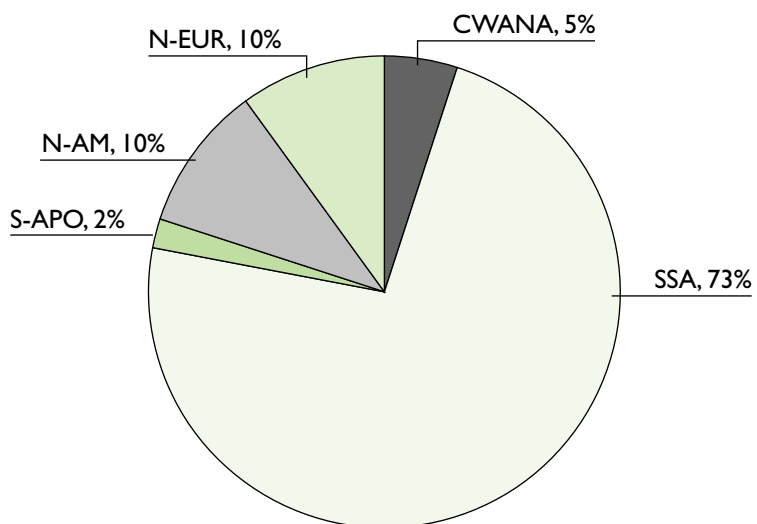
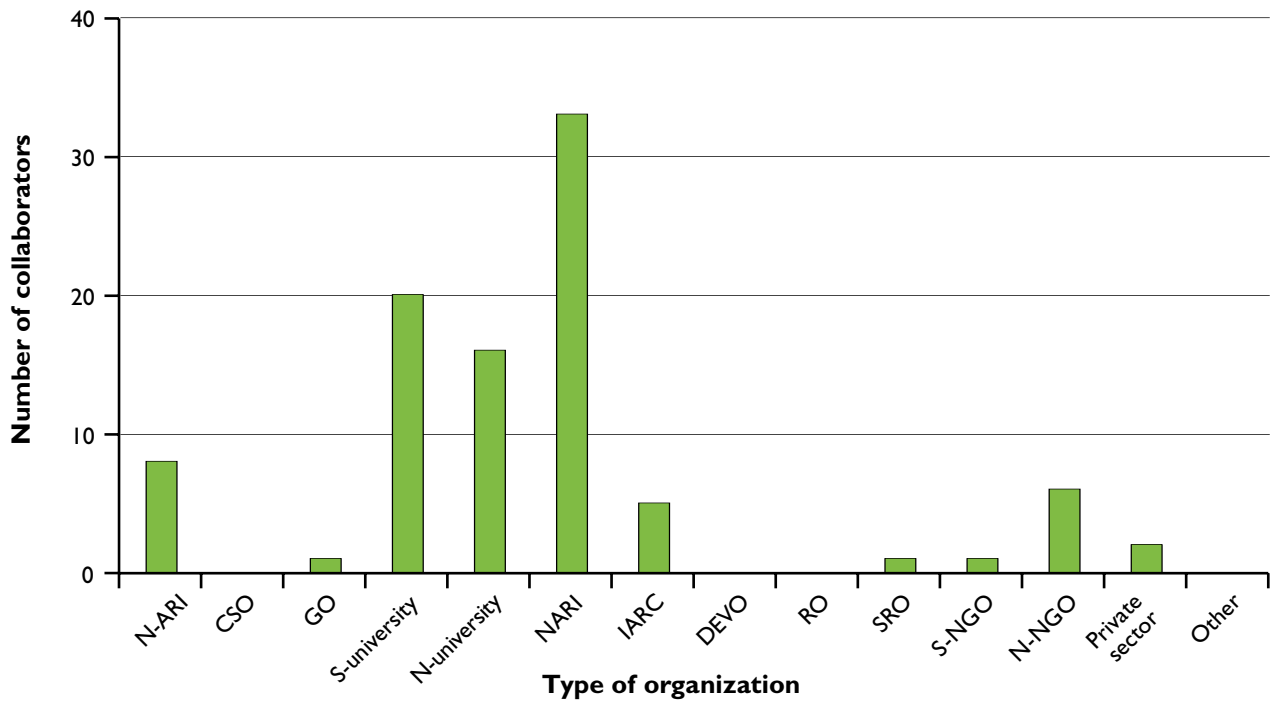
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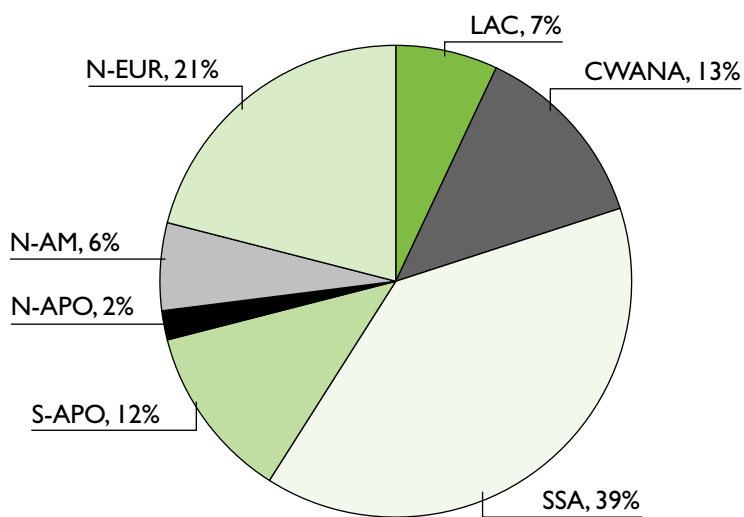
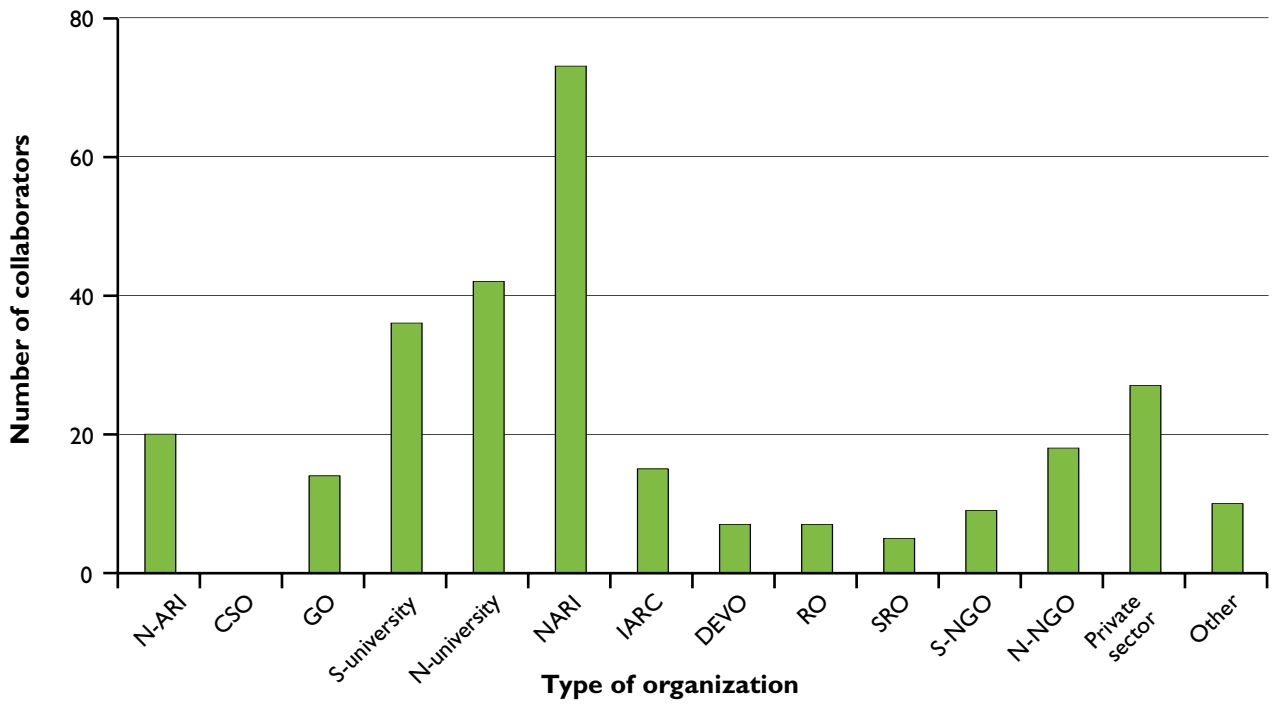
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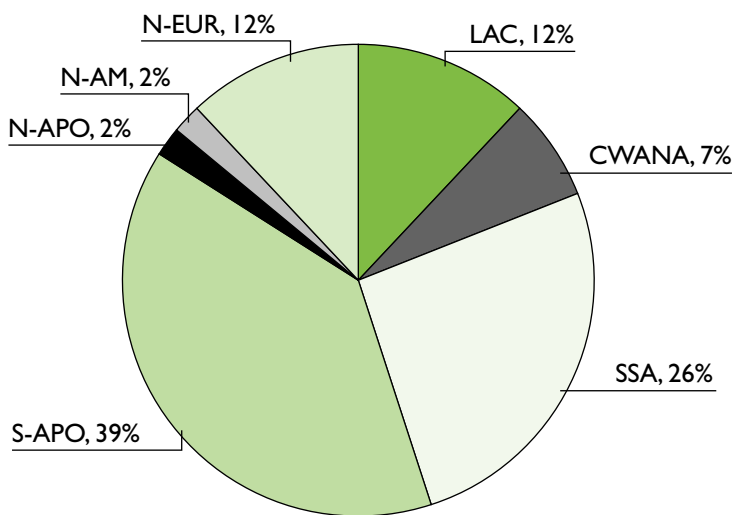
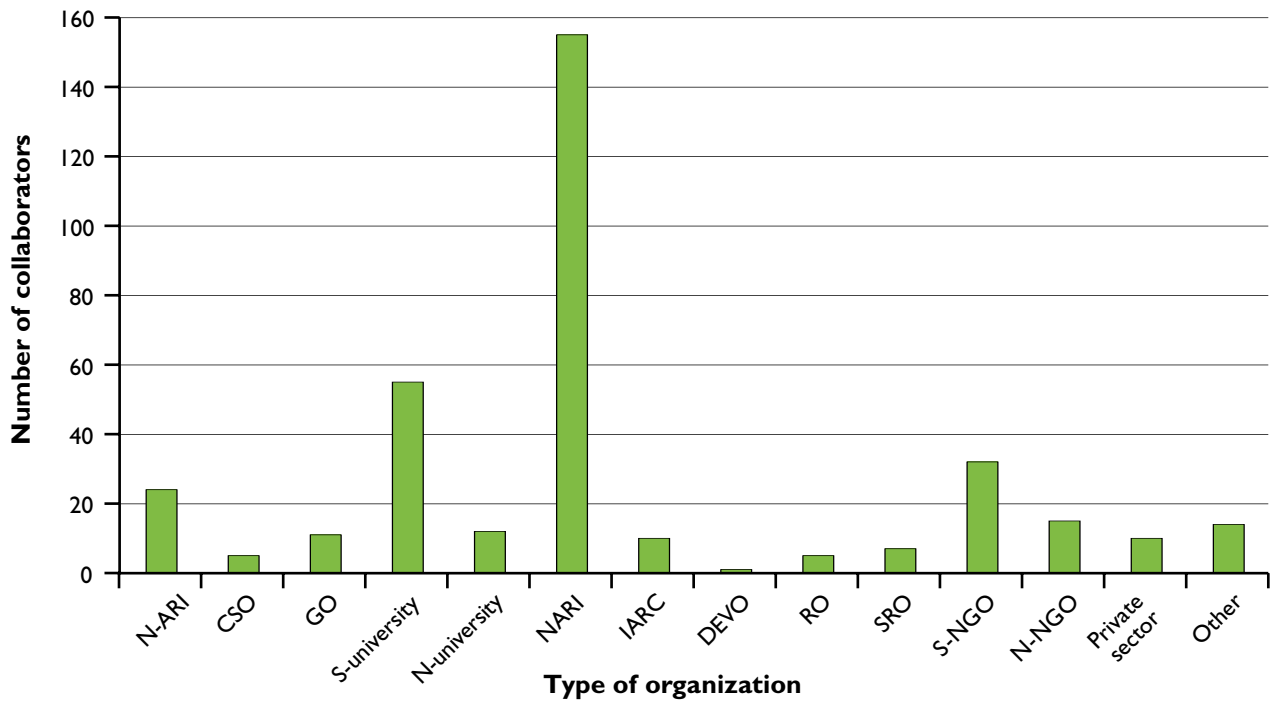
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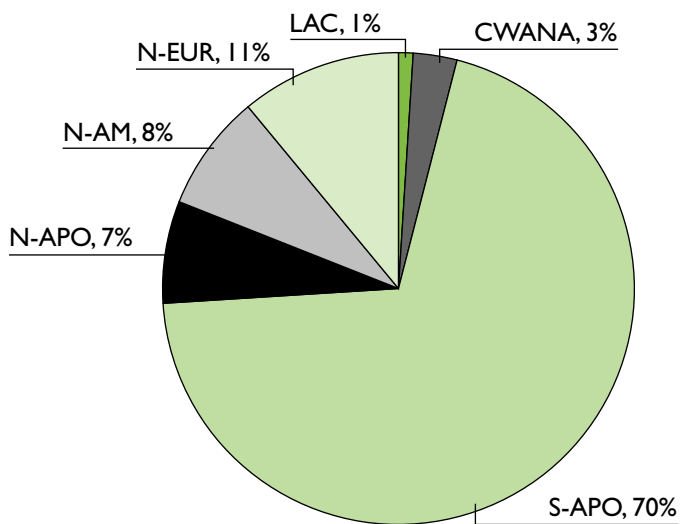
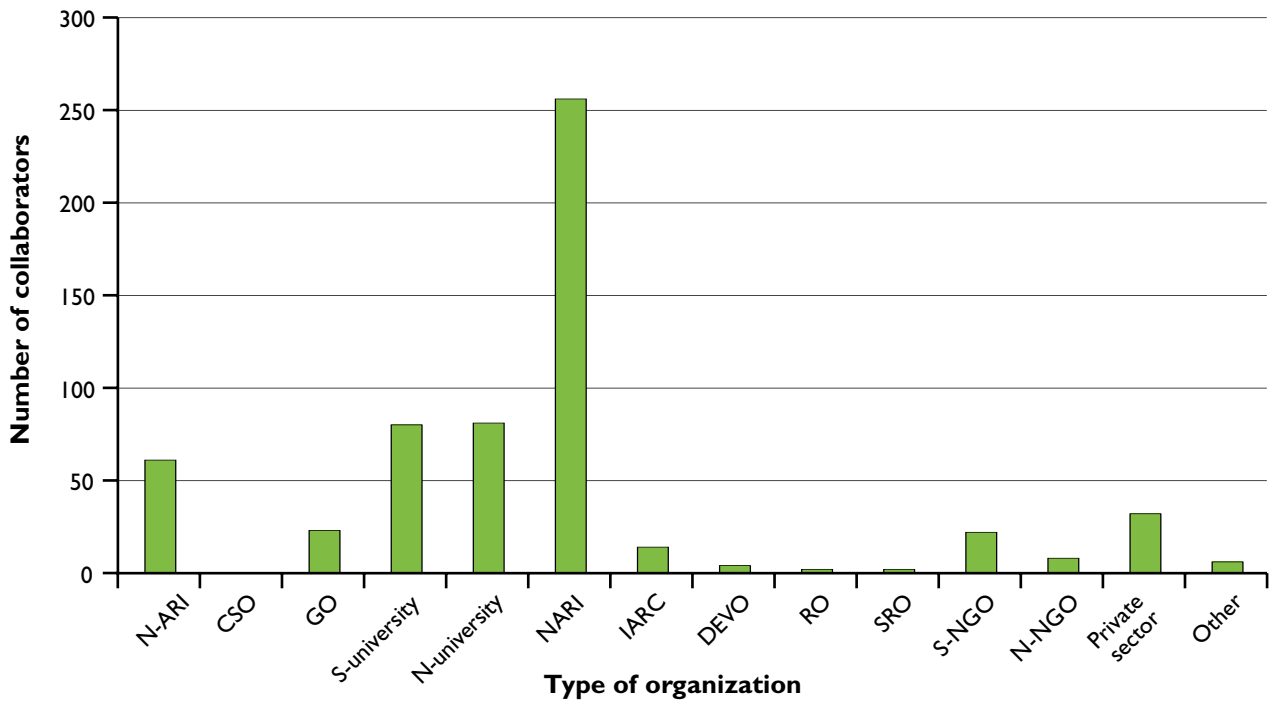
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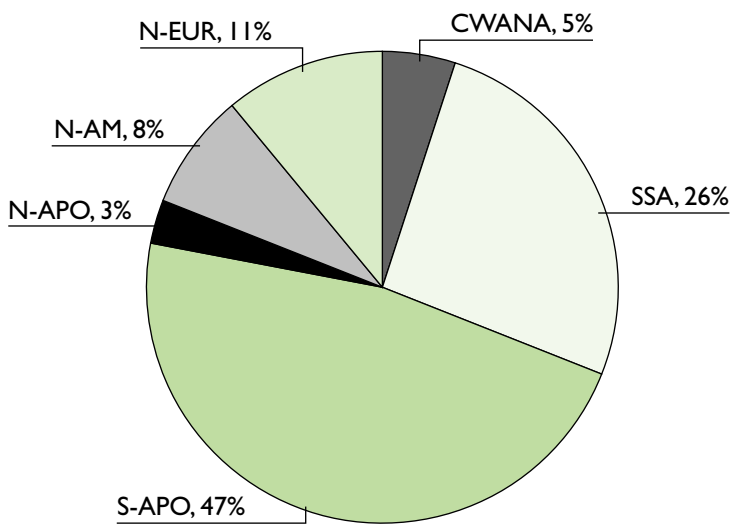
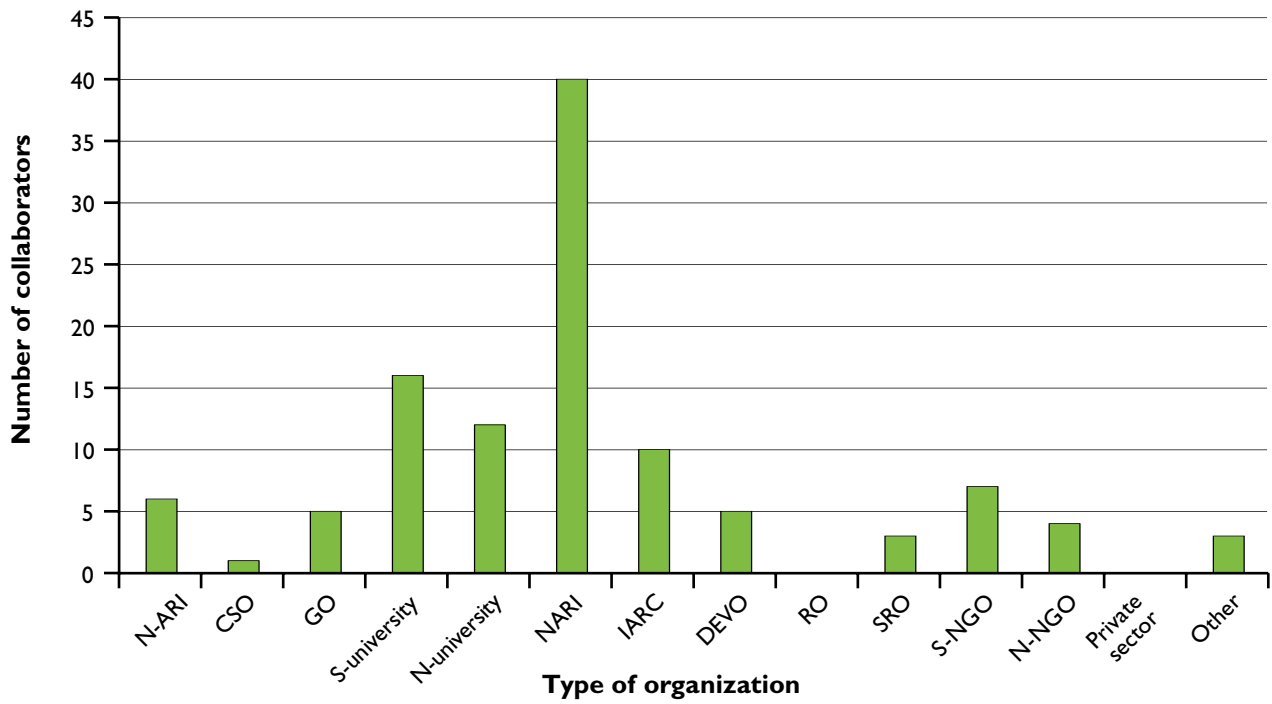
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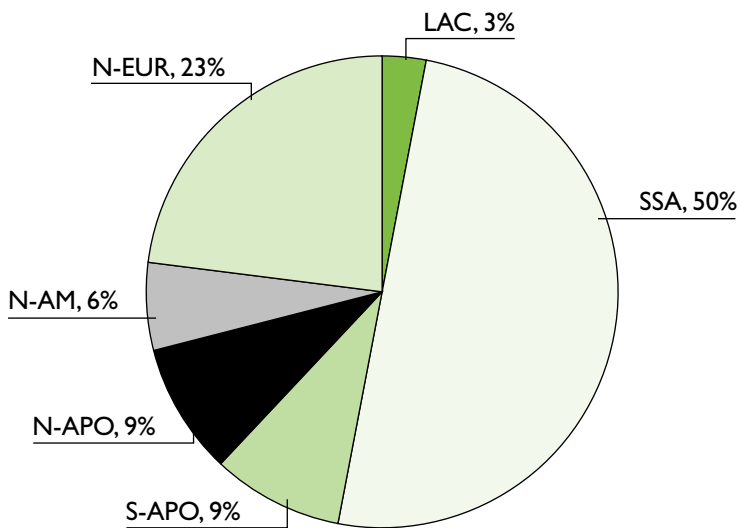
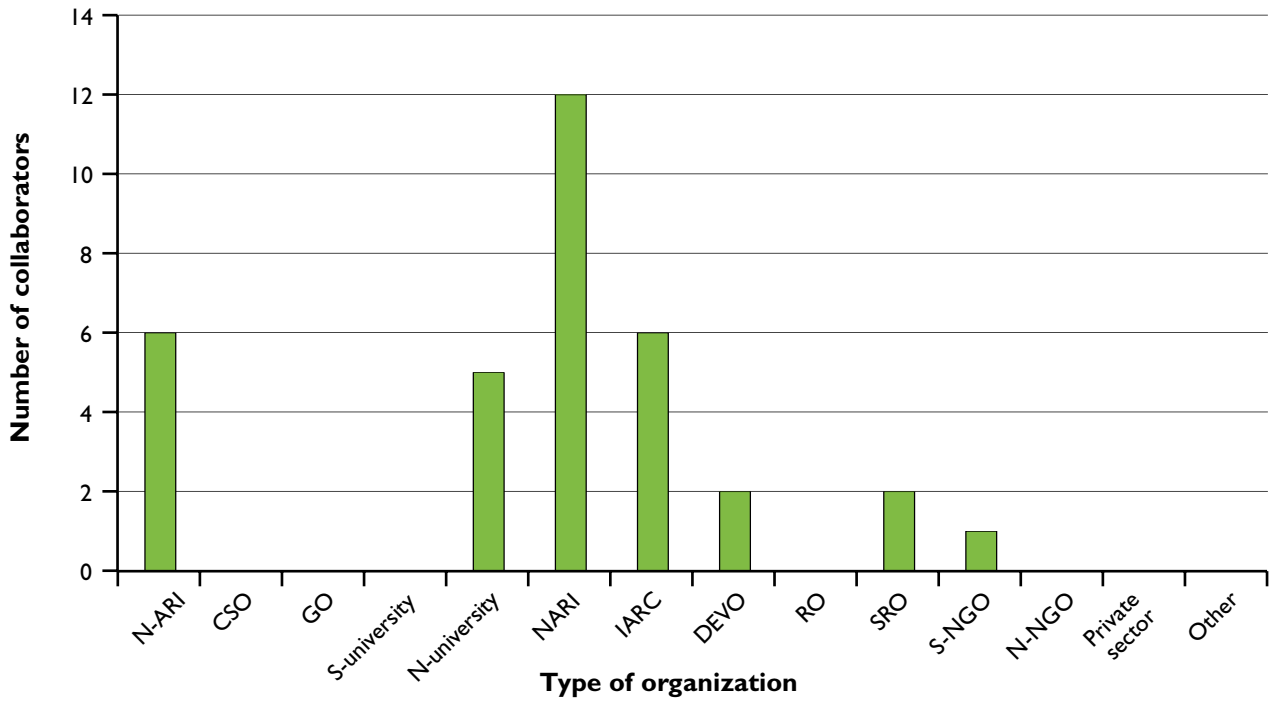
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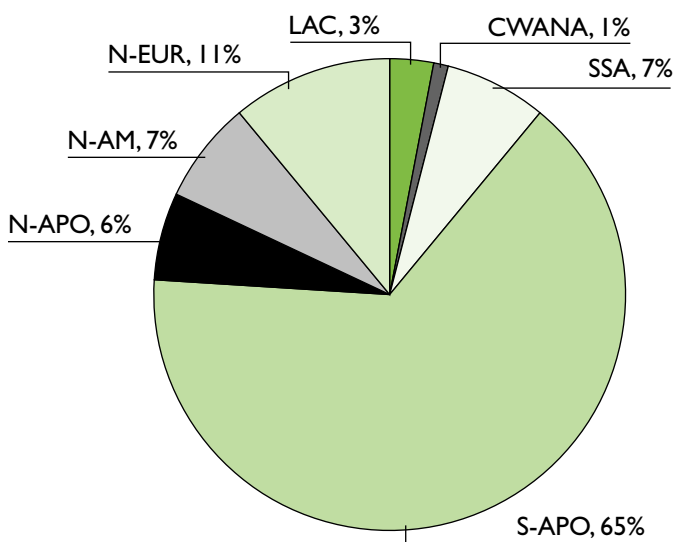
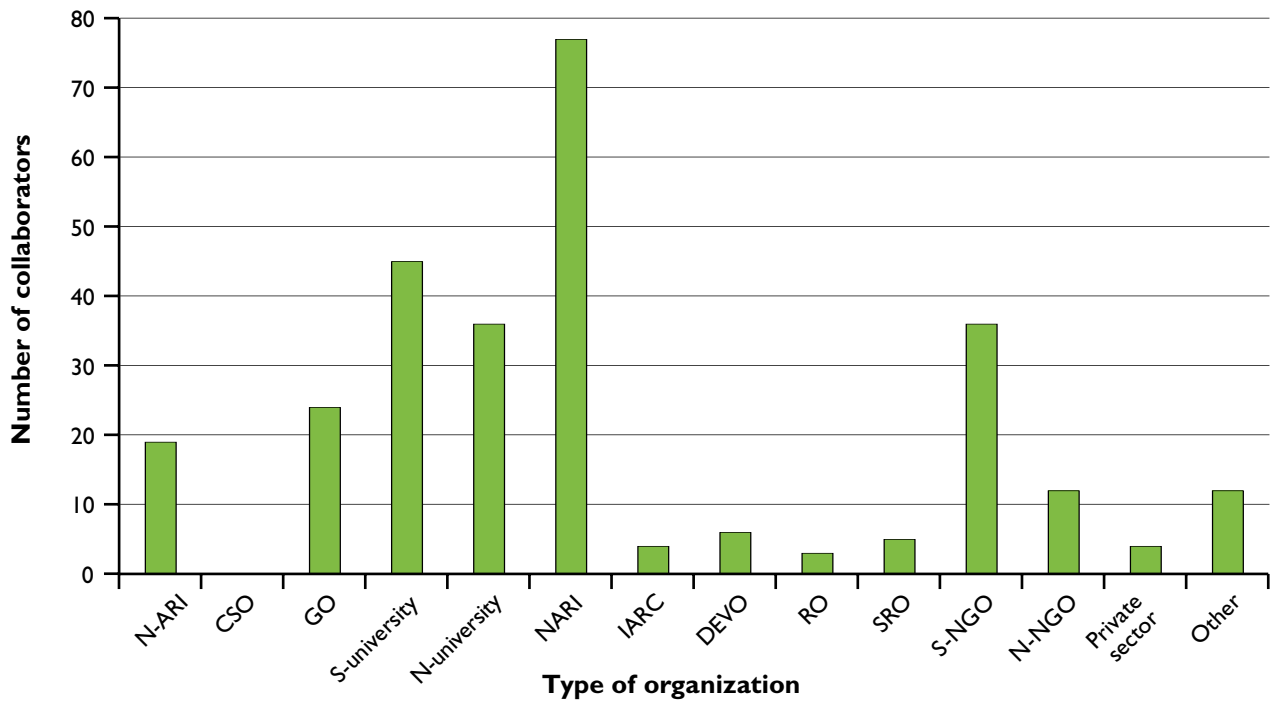
IWMI



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