

Science-Metrix

CGIAR citations in IPCC reports

A Summary report



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Acronyms

CIFOR	Center for International Forestry Research
CCAFS	CGIAR Research Program on Climate Change, Agriculture and Food Security
CGIAR	Consortium of International Agricultural Research Centers
ICARDA	International Center for Agricultural Research in the Dry Areas
CIAT	International Center for Tropical Agriculture
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IFPRI	International Food Policy Research Institute
IITA	International Institute of Tropical Agriculture
ILCA	International Livestock Center for Africa
ILRI	International Livestock Research Institute
CIMMYT	International Maize and Wheat Improvement Center
IPGRI	International Plant Genetic Resources Research Institute
CIP	International Potato Center
IRRI	International Rice Research Institute
IWMI	International Water Management Institute
WARDA	West Africa Rice Development Association
ICRAF	World Agroforestry Center
ISP	Independent Science Panel

1 Introduction

In the April 2011 meeting of the CCAFS Independent Science Panel (ISP), the ISP asked CCAFS to prepare papers of relevance to the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5). The topic was further discussed in the November 2011 meeting of ISP. Discussions on getting CCAFS and broader CGIAR science into the AR5 had already begun between the management team and Center contact points in Cancun in 2010, and further plans were discussed at the Contact Point meeting in Copenhagen in 2012. The focus was both on adaptation and mitigation issues.

In March 2015, Science-Metrix was contracted by CGIAR to evaluate the presence of CGIAR publications in the IPCC assessment reports (ARs). The study was carried through the analysis of the IPCC ARs' references. Chapters from various IPCC ARs focusing on adaptation and mitigation issues were selected by CGIAR for analysis. The references contained in these chapters were matched to the scientific articles contained in the Web of Science database and all authors having a CGIAR affiliation were identified. References that were not scientific articles (e.g., books or reports) were searched on the web and authors with CGIAR affiliation were identified manually. Statistics at the chapter level and affiliation level (CGIAR organisations) were then computed, as well as a list of the most frequent CGIAR collaborators (collaborators on papers cited in the selected IPCC ARs chapters). This report highlights the salient findings resulting from the analysis.

Section 2 concentrates on the references from the selected IPCC ARs chapters with an adaptation focus, especially with a focus on agriculture and sometimes with a focus on forestry. Section 3 reports the results for IPCC ARs chapters with a mitigation focus, including some focus on agriculture.

2 Adaptation

The analysis in this section is based on the following chapters from IPCC Assessment Reports:

- Section 5.3 (Agriculture) and 5.5 (Rangelands [Grasslands, Savannas, and Deserts]) from chapter 5 of the Climate Change 2001 IPCC Third Assessment Report
- Chapter 1 (Assessment of Observed Changes and Responses in Natural and Managed Systems) from the Climate Change 2007 IPCC Fourth Assessment Report
- Chapter 5 (Food, Fibre, and Forest Products) from the Climate Change 2007 IPCC Fourth Assessment Report
- Chapter 7 (Food security and food production systems) from the Climate Change 2014 IPCC Fifth Assessment Report

Those chapters focus on adaptation, especially in the field of agriculture, but also include some topics in forestry. Subsection 2.1 presents a temporal analysis of the IPCC references to articles written by CGIAR affiliated author(s) as well as an analysis of the distribution of these references across the various CGIAR organisations. Subsection 2.2 explores the most popular collaborators of CGIAR authors cited in the IPCC chapters.

2.1 Temporal analysis of citations

The first two chapter sections to be analysed were section 5.3 and section 5.5 from the 2001 IPCC Assessment Report. As shown in Table I, in the early 2000s, CGIAR publications were not cited very often by their peers at the IPCC. Indeed, only six references to a CGIAR publication (out of 287 references) were counted for the two sections taken together. This amounts to a CGIAR citation ratio of 2.1% for the two sections combined. In the selected chapters of the 2007 IPCC AR4, the situation is similar to the 2001 edition. Although the absolute number of CGIAR references is higher, so is the number of total citations per chapter, leading to a ratio of CGIAR citation of 2.2% for the two selected chapters of the 2007 IPCC AR4, only 0.1 percent point higher than the 2001 edition.

Table I Reference to articles produced by CGIAR affiliated author(s) per chapter

IPCC selected chapter	CGIAR affiliated citation	Total citation	Ratio
2001-chap 5 (§ 5.3) "Agriculture"	5	203	2.5%
2001-chap 5 (§ 5.5) "Rangelands (Grasslands, Savannas, and Deserts)"	1	85	1.2%
2007-chap 1 "Assessment of Observed Changes and Responses in Natural and Managed Systems"	4	573	0.7%
2007-chap 5 "Food, Fibre, and Forest Products"	17	390	4.4%
2014-chap 7 "Food security and food production systems"	73	503	14.5%

Source: Computed by Science-Metrix using WoS data (Thomson Reuters)

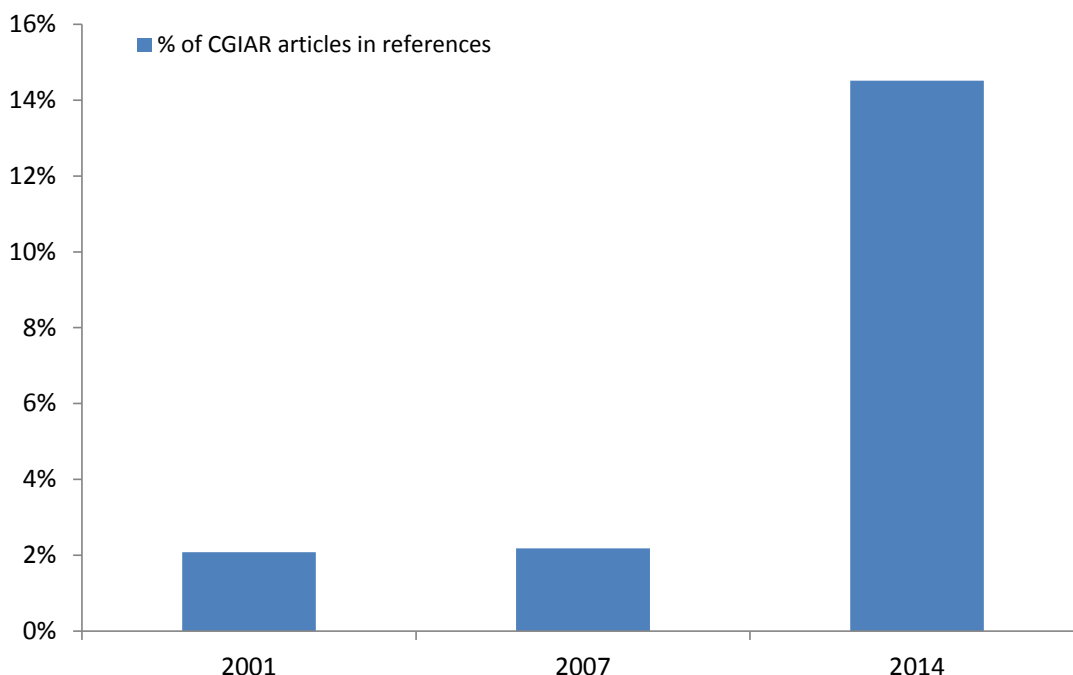


Figure 1 Presence of CGIAR publications in the references of IPCC selected chapters that focus on adaptation for IPCC AR3 (2001), AR4 (2007) and AR5 (2014)

Source: Computed by Science-Metrix using WoS data (Thomson Reuters)

The largest change happened between 2007 and 2014, coinciding with the application of the ISP directive in 2011 to prepare papers of relevance to the IPCC AR5. Indeed, in chapter 7 of the IPCC AR5, 73 references out of 503 were attributed to a CGIAR affiliated author. This made the ratio of CGIAR citation jump from 2.2% for 2007 up to 14.5% for 2014. Figure 1 above shows the evolution of the CGIAR citation ratio aggregated by year for the selected chapters that have a focus on adaptation.

The number of CGIAR organisations that produced publications cited in the IPCC ARs increased significantly from one edition to the other. In the 2001 IPCC AR3, only three organisations were involved in the cited CGIAR publications (data not shown)—namely, IFPRI (3 citations), IRRI (2 citations) and CIFOR (1 citation). The number of CGIAR organisations participating rose to 10 for the 2007 IPCC AR4 and up to 13 for the 2014 IPCC AR5. The distribution of the organisations and the number of cited publications they produced is shown in Figure 2 and Figure 3.

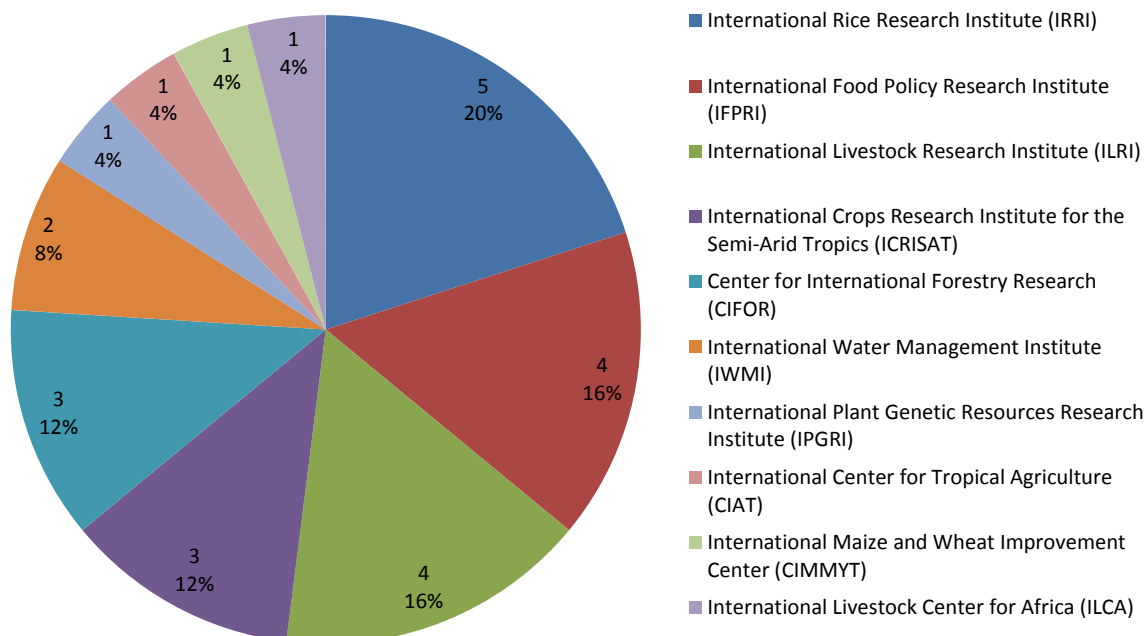


Figure 2 Distribution of CGIAR organisations that produced cited publications in the 2007 IPCC AR4 adaptation chapters (chap. 1 and chap. 5)

Note: The number in each slice represents the number of cited publications produced by the organisation and the percentage that this represents is shown below it.

Source: Computed by Science-Metrix using WoS data (Thomson Reuters)

In the 2007 IPCC AR4 chapters related to adaptation, the largest contributions of CGIAR cited publications come from IRRI (5 citations), IFPRI (4) and ILRI (4). The other CGIAR organisations that contributed to more than one publication are ICRISAT (3), CIFOR (3) and IWMI (2).

The situation is similar but less pronounced for chapter 7 of the 2014 IPCC AR5, the same trio (IFPRI, IRRI and ILRI) leads the count, although in a different order, with 18, 12 and 11 cited publications respectively. Next in ranking, CIAT and CIMMYT offered a fair contribution with 10 and 8 publications respectively, then come ICARDA and ICRISAT with 5 cited publications each. One can notice the appearance of a non-CGIAR entity, Andrew Challinor from the University of Leeds, bringing in a major contribution with a total of 9 publications being cited by chapter 7 of the IPCC AR5. Science-Metrix was asked to identify the publications of Professor Challinor, who co-leads Flagship work on Climate Smart Agriculture for CCAFS,¹ within the count of CGIAR publications. The most cited organisations throughout the three editions were IFPRI, IRRI and ILRI.

¹ <http://www.see.leeds.ac.uk/people/a.challinor>

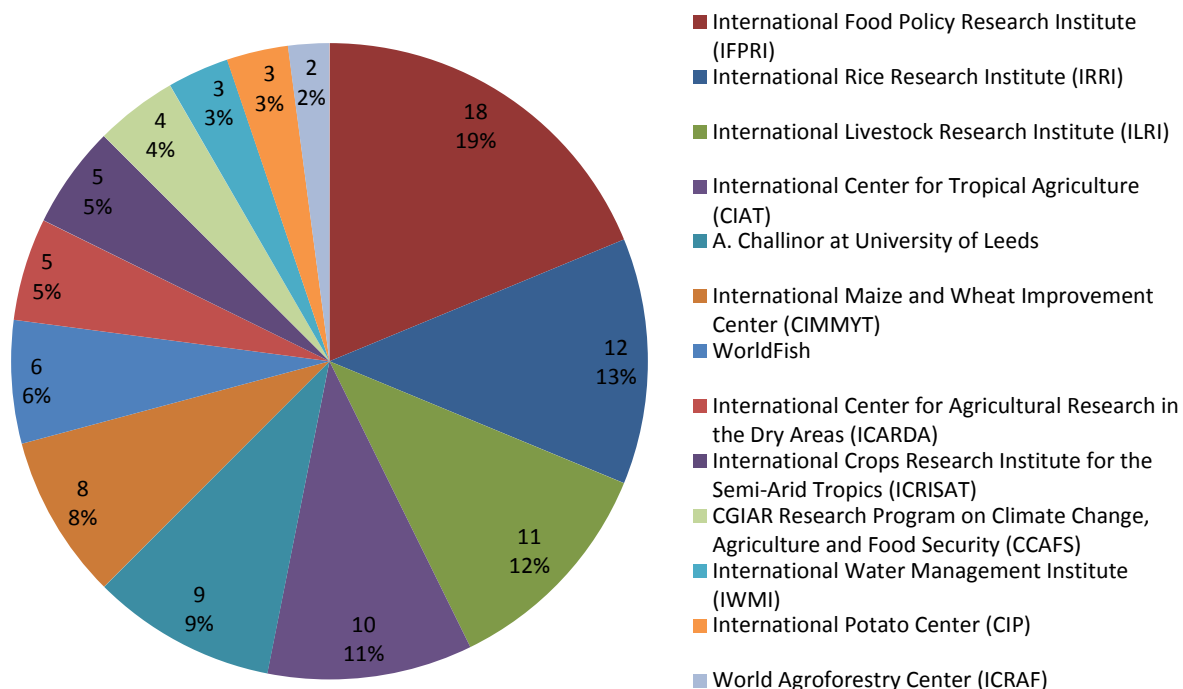


Figure 3 Distribution of CGIAR organisations that produced cited publications in the 2014 IPCC AR5 adaptation chapter (chap. 7)

Note: The number in each slice represents the number of cited publications produced by the organisation and the percentage that this represents is below it.

Source: Computed by Science-Metrix using WoS data (Thomson Reuters)

2.2 Collaboration between CGIAR and other organisations

Scientific research is often carried out by more than one individual. CGIAR researchers make no exception to this and they collaborate with multiple institutions around the world. Below is a list of the institutions that collaborated the most frequently with CGIAR on the publications cited in the chapters related to adaptation from the IPCC reports of 2001, 2007 and 2014. The CGIAR organisations are all aggregated since the numbers were too small when taken by individual organisation.

Table II Most frequent institutional collaborators in CGIAR cited publications from chapters related to adaptation from the 2001, 2007 and 2014 IPCC ARs

Collaborator institution	No. Collaborations
University of Reading	5
Wageningen University & Research Centre	4
University of Florida	4
Michigan State University	4
Food and Agriculture Organization of the United Nations	4
Centre for Environment, Fisheries and Aquaculture Science (Cefas)	3
Chinese Academy of Science	3
Potsdam Institute for Climate Impact Research	3
Simon Fraser University	3
Stanford University	3
University of Bonn	3
University of California, Davis	3
University of East Anglia	3
Waen Associates	3

Note: Other developing country collaborators included: Banaras Hindu University, EMBRAPA, the Indian Agricultural Research Institute, Punjab Agricultural University, University of Zimbabwe, Zambia Agricultural Research Institute

Source: Computed by Science-Metrix using WoS data (Thomson Reuters)

Most of the organisations listed above have a strong faculty, school or department focusing on food and/or agriculture research, or they are a specialised organisation in the field. For example, the University of Reading has the School of Agriculture, Policy and Development, which is among the world leaders in teaching and research according to their website. Wageningen University offers many educational and research programs related to climate, soil and water, food production, and landscape and nature conservation. The University of Florida is affiliated with the Institute of Food and Agricultural Sciences (IFAS), which is a large research facility with offices in all 63 counties of Florida, 13 research and education centres, and many colleges that are part of the University of Florida. In terms of geographical location, out of the 14 top collaborator institutions shown in Table II, five are from United Kingdom and four are from the United States. The others come from China, Canada, the Netherlands and Germany.

3 Mitigation

The analysis in this section is based on the following chapter from IPCC Assessment Reports:

- Section 4.2 (Land Use, Land-Use Change, and Carbon Cycling in Terrestrial Ecosystems) and 4.3 (Processes and Practices that Can Contribute to Climate Mitigation) from chapter 4 of the Climate Change 2001 IPCC Third Assessment Report
- Chapter 8 (Agriculture) from the Climate Change 2007 IPCC Fourth Assessment Report
- Chapter 11 (Agriculture, Forestry and Other Land Use (AFOLU)) from the Climate Change 2014 IPCC Fifth Assessment Report
- The “2013 Supplement to the 2006 Guidelines: Wetlands”

This section intends to summarise the results from the selected IPCC ARs chapters (plus the supplement of the 2006 guideline) with a mitigation focus. It is organised in the same order as the previous section.

3.1 Temporal analysis of citations

Table III Reference to articles produced by CGIAR affiliated author(s) per chapter

IPCC selected chapter	CGIAR affiliated citation	Total citation	Ratio
2001-chap 4 (§ 4.2) “Land Use, Land-Use Change, and Carbon Cycling in Terrestrial Ecosystems”	2	98	2.0%
2001-chap 4 (§ 4.3) “Processes and Practices that Can Contribute to Climate Mitigation”	4	115	3.5%
2007-chap 8 “Agriculture”	10	267	3.7%
Chap suppl. “2013 Supplement to the 2006 Guidelines: Wetlands”	13	787	1.7%
2014-chap 11 “Agriculture, Forestry and Other Land Use (AFOLU)”	52	823	6.3%

Source: Computed by Science-Matrix using WoS data (Thomson Reuters)

In a similar manner to the chapters on adaptation, the chapters on mitigation from the years 2001 and 2007 rarely cite a CGIAR publication. The citation rate of CGIAR publications varies between 2.0% and 3.7%. The “2013 supplement to the 2006 Guidelines: Wetlands”, even though produced at a later time (2011–2013), does not cite CGIAR publications very often. In fact, it has the lowest CGIAR citation rate of all chapters, with only 1.7%. The selected chapter from the last edition of the IPCC AR (2014) presents a ratio of CGIAR citation that is almost twice those of 2001 and 2007. However, at 6.3% it is lower than the 2014 chapter on adaptation, which sits at 14.5% (Table I).

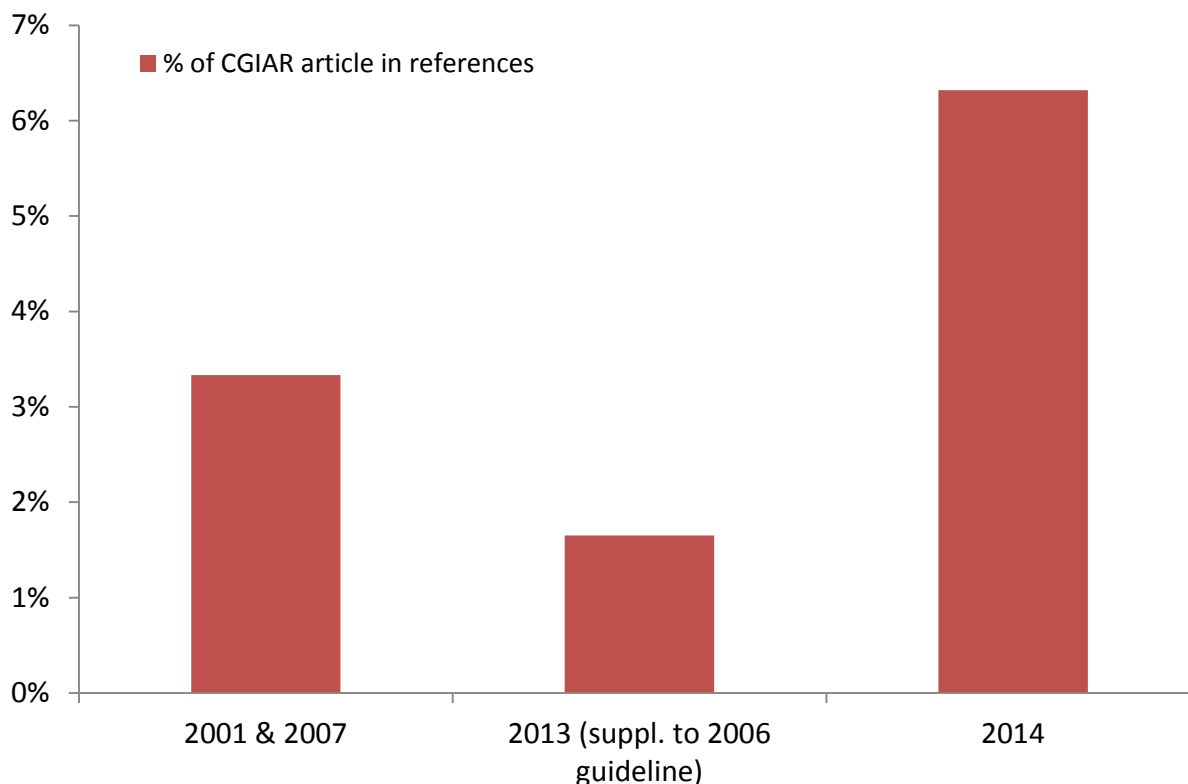


Figure 4 Presence of CGIAR publications in the references of IPCC selected chapters that focus on mitigation for the 2006 guidelines (2006), IPCC AR3 (2001), AR4 (2007) and AR5 (2014)

Source: Computed by Science-Metrix using WoS data (Thomson Reuters)

Figure 4 displays the CGIAR citation rate for the selected chapters on mitigation from the IPCC ARs (note that 2001 and 2007 are grouped together) and for the “2013 Supplement to the 2006 Guidelines: Wetlands”. The pre-2014 IPCC chapters (2001 and 2007 combined) show a CGIAR citation ratio of only 3.3%, compared to 6.3% for the 2014 chapter.

Before the 2014 edition, only a few CGIAR organisations produced publications that were cited in the IPCC ARs. Indeed, only three different organisations are present in the 2001 selected chapters, increasing to four for the 2007 chapters (Figure 5) as well as for the supplemental chapter (Figure 6). The three CGIAR organisations cited in the selected chapters of IPCC AR3 (2001) are CIAT (3 citations), ICRAF (2) and CIFOR (1). In the 2007 edition, ICRAF accounts for 40% (4 publications) of the cited CGIAR publications, followed by IFPRI with 3 publications (30% of the citations), IRRI with 2 publications (20%) and CIAT with 1 publication (10%). The most cited organisation of the supplemental chapter is CIFOR, with 8 cited CGIAR publications representing 61% of all cited publications from this chapter.

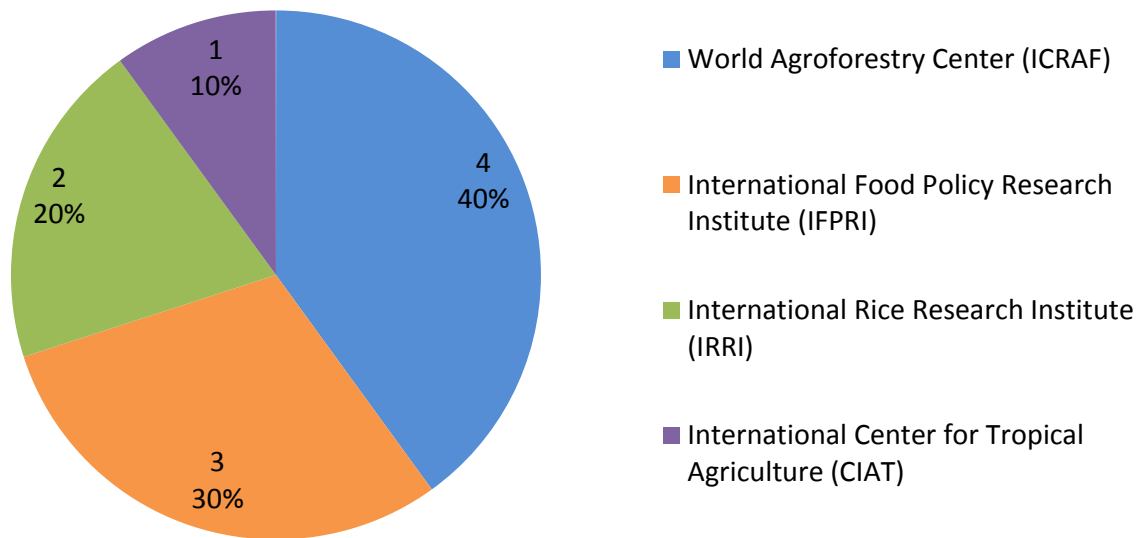


Figure 5 Distribution of CGIAR organisations that produced cited publications in the 2007 IPCC AR4 mitigation chapter (chap. 8)

Note: The number in each slice represents the number of cited publications produced by the organisation and the percentage that this represents is below it.

Source: Computed by Science-Metrix using WoS data (Thomson Reuters)

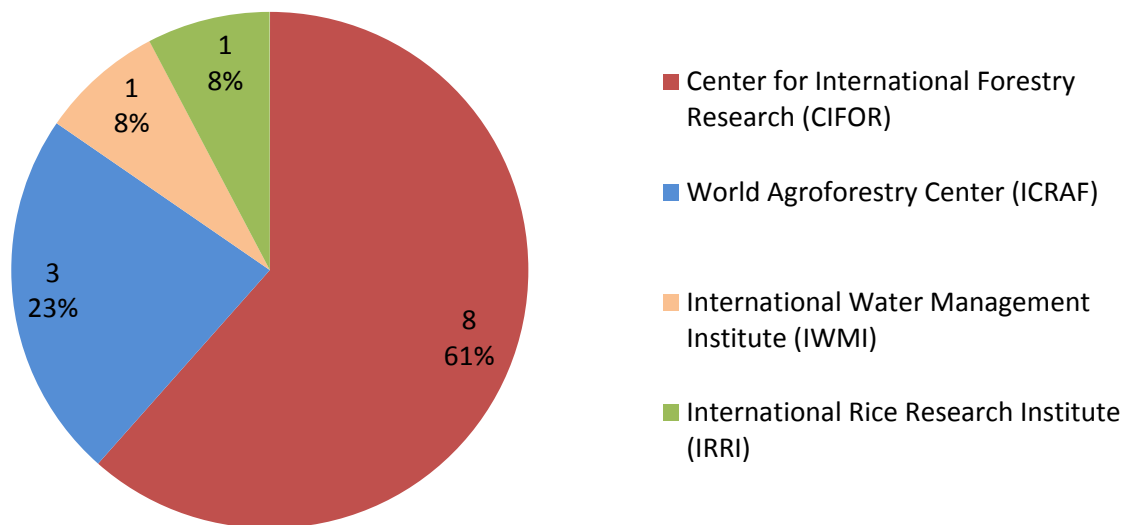


Figure 6 Distribution of CGIAR organisations that produced cited publications in the “2013 Supplement to the 2006 Guidelines: Wetlands”

Note: The number in each slice represents the number of cited publications produced by the organisation and the percentage that this represents is below it.

Source: Computed by Science-Metrix using WoS data (Thomson Reuters)

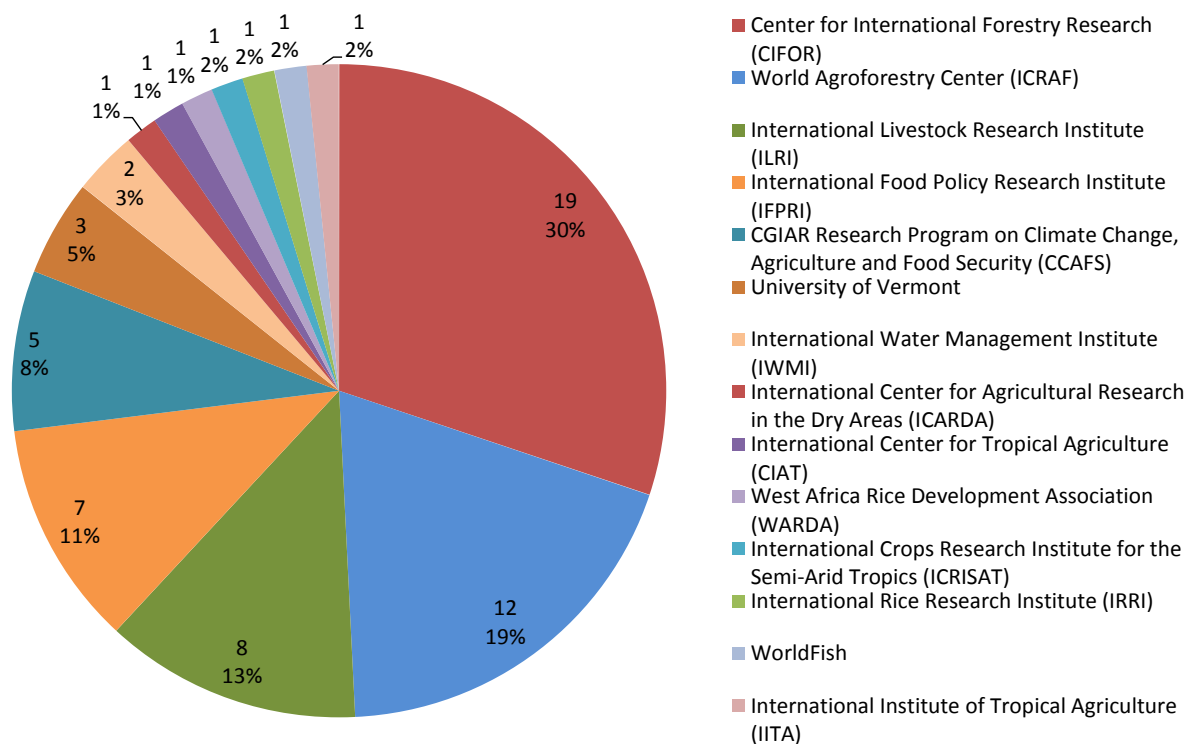


Figure 7 Distribution of CGIAR organisations that produced cited publications in the 2014 IPCC AR5 mitigation chapter (chap. 11)

Note: The number in each slice represents the number of cited publications produced by the organisation and the percentage that this represents is below it. Organisations with 1 publication are not shown in the legend.

Source: Computed by Science-Metrix using WoS data (Thomson Reuters)

A much larger number of CGIAR organisations participated in the 2014 chapter on mitigation. In total, 14 organisations generated at least one publication that was cited. However, half of them produced only one cited publication. The largest share of publications, 30%, hails from CIFOR, which contributed to 19 publications. ICRAF comes in second place; its publications account for 19% (12 publications) of the total CGIAR citations of this chapter. IFPRI and ILRI also provided a significant number of publications, 8 and 7 respectively, accounting for 13% and 11% of the total. It is interesting to note that the University of Vermont provided 3 publications cited in this chapter. ICRAF, CIFOR and IFPRI are the CGIAR organisations that presented the most publications on mitigation throughout the three IPCC Assessment Reports.

3.2 Collaboration between CGIAR and other organisations

Table IV presents the institutions that collaborated with CGIAR on the papers cited in mitigation chapters.

Table IV Most frequent institutional collaborators in CGIAR cited publications from chapters related to mitigation from the 2001, 2007 and 2014 IPCC ARs

Collaborator institution	No. Collaborations
International Institute for Applied Systems Analysis (IIASA)	4
University of Aberdeen	3
University of Copenhagen	3
University of Edinburgh	3
University of Florida	2
Cranfield University	2
Utrecht University	2
Wageningen University & Research Centre	2
University of Wisconsin Madison	2
US Forest Service	2
United Nations University	2
Colorado State University	2
Columbia University	2
University of Leuven (KU Leuven)	2
University of Illinois at Urbana–Champaign	2
Oregon State University	2
Bogor Agricultural University (or Institut Pertanian Bogor)	2
Chalmers University of Technology	2
Duke University	2
CSIRO	2
Smithsonian Institution	2
Fraunhofer Institute	2

Note: Other developing country collaborators included: Bogor Agricultural University, Cheikh Anta Diop University, EMBRAPA, Indian Institute of Science, Philippine Rice Research Institute and University of Brasilia

Source: Computed by Science-Metrix using WoS data (Thomson Reuters)

The top collaborators on CGIAR mitigation papers are different from the collaborators on adaptation papers, with the exception of the University of Florida and the Wageningen University & Research Centre. The top four are all from Europe, more precisely from Austria, the United Kingdom and Denmark. The International Institute for Applied Systems Analysis (IIASA) in Austria is an international and independent scientific institute that conducts research on three interlinked goals: Energy & Climate Change, Food & Water and Poverty & Equity. They collaborated with CGIAR on 4 papers that are cited in the mitigation chapters (all years combined). In the UK, it is the University of Aberdeen and University of Edinburgh that are the most frequent collaborators, with 3 collaborations each. The University of Aberdeen is well positioned to collaborate on mitigation papers since three out of its four cross-university research themes touch on the subject. These themes are: Energy, Environment & Food Security, and The North. The other institution to have

collaborated on 3 mitigation papers is the University of Copenhagen in Denmark. The university has defined its interdisciplinary strengths on its website and it is interesting to note that almost half of them may deal with a mitigation issue. These are Biological Production, Food, Climate & Sustainability, and Water.

4 Conclusion

We can clearly observe an increase in the ratio of cited CGIAR publications between the earlier editions and the fifth edition of the IPCC AR, at least for the selected chapters. The chapters on adaptation show the greatest increase (+12.3 percentage points), while the chapters on mitigation present a more modest ratio increase, going from 3.3% to 6.3%. In terms of the number of CGIAR organisations that participated in the cited publications, this figure increased from only three in the 2001 edition to 13 and 14 for the adaptation and mitigation chapters respectively for the 2014 edition. The CGIAR organisations that published the most publications in adaptation chapters are IFPRI, IRRI and ILRI, while for the mitigation chapters they are CIFOR, ICRAF and ILRI.