

CGIAR's contribution to peace: Portfolio Analysis

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Introduction

Much of CGIAR's research contributes to improving the prospects of peace, however there is a lack of articulation of our work in the Humanitarian, Development, and Peace (HDP) nexus. We conducted a portfolio analysis of CGIAR's ongoing portfolio that has potential to contribute to the prospects of peace. The results of the portfolio analysis are visualized on a website, (<https://www.climatesecurity.cgiar.org/>), additionally offering a centralized platform to present ongoing initiatives and events around the emerging research area to spearhead research to support peace and security partners.

This report briefly summarizes the implementation and outputs around the portfolio analysis and related components of the website development. It serves as documentation on the reproducibility of the working process, not as exhaustive summary or interpretation of the portfolio analysis results.

Strategy

The portfolio analysis comprised two main working steps: 1) Information generation and 2) Visualization of portfolio results. Please see the implementation plan / [protocol](#) with working steps and time schedule for more detailed information.

1) Information generation

- a) A literature review on general climate security research to identify studied drivers and pathways between climate and conflict was conducted. Drivers and if available, impact pathways along with further meta information was extracted from relevant studies (selection criteria for study inclusion can be found in the [protocol](#), p. 5 "1a) Identification of drivers and pathways via literature review". Though the objective of this literature review was solely to get a qualitative/conceptual overview of climate security research, mostly studies using statistical methods were chosen. Based on the above, conceptual "driver of conflicts interaction graphs" were constructed.
- b) The identified drivers and pathways from literature served as basis to orientate the search and mapping of CGIAR research contributions on climate security. For the latter, CGIAR publication repositories ([protocol](#), Table 4 CGIAR data platforms for online search) adequate for a subsequent keyword search ([protocol](#), Online keyword search) were reviewed and selected. Selected research items were then reviewed and relevant data extracted into a data entry

sheet, containing meta information on definitions and concepts around [drivers](#) and [conflicts](#), among others. The iterative process of keyword search, data entry and data validation were tested and optimized with involved staff. Finally, data were cleaned and processed, and basic descriptives derived.

2) Visualization of portfolio results

[Content, layout and functionality](#) for a website to present CGIAR's climate security research agenda as well as the portfolio analysis results were designed. An interactive website was developed, providing the user with an explorer tool to search for research items related to climate security based on the dataset created during the portfolio analysis.

Technical details on the website development: html, css, javascript and R for the shiny server was used. Version control was done using git, shared which via bitbucket. For hosting an Ubuntu OS was used, on which shiny was installed as well as nginx as a proxy server to enable SSL encryption using certbot.

Data outputs and observations

1a) Literature review

A total of [197 papers](#) on climate security was reviewed, of which 67 were used to build a [database](#) with extracted drivers and pathways. A summary of some key data on used methods, conflict types, driver categories and regions can be seen in the below table. More detailed information on studied drivers and pathways are listed in the database.

Table 1. Summary of climate security literature review

Method	#	Conflict type	#	Driver category	#	Region	#
Statistical analysis	41	Violent conflict	74	Environmental	87	Africa	29
Systematic review	7	Land and natural resource conflict	5	Social	51	Global	24
Qualitative case study	6	(Inter)Communal conflict	4	Institutional/Political	26	Asia	9
Theoretical / conceptual	5			Agronomic	21	South America	4
Quantitative case study	4			Economic	17	Europe	1
GIS-based risk analysis	2						
Integrated approach	2						

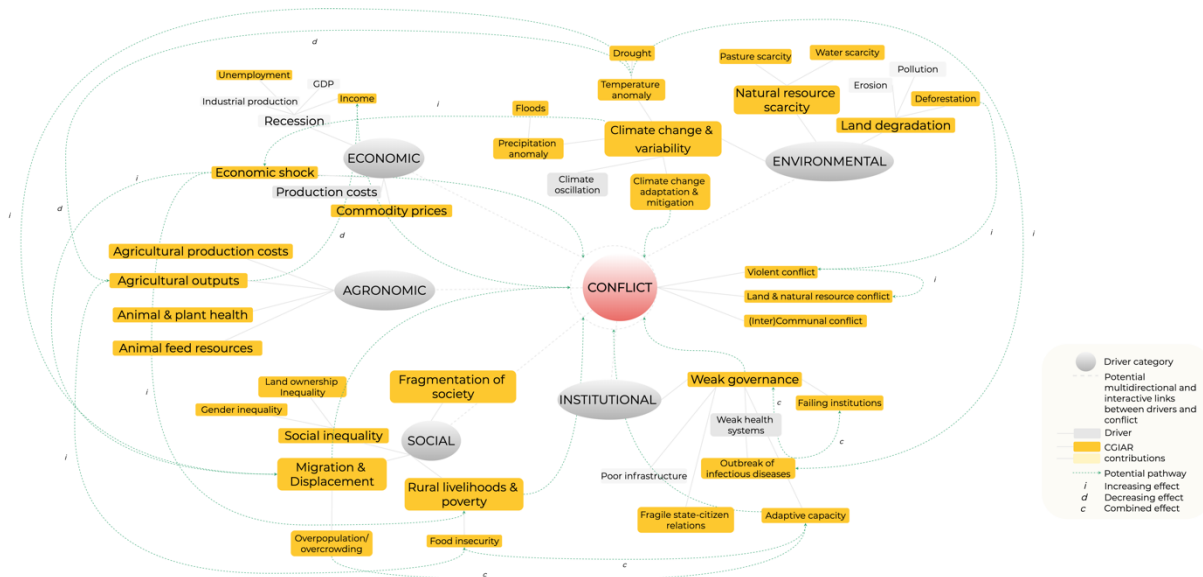
Synthesizing/visualizing potential drivers, pathways and interactions from climate security literature in an overarching graph was a challenge because of following reasons:

- **Different study methods:** Many studies analyse links conceptually, others show correlation between one climate variable and a conflict and discuss others without including them in an

analysis, and only very few actually look at pathways and hence explain causality. It is challenging to combine these qualitative and quantitative studies to produce a pathway graph that suggests causal links. Even within the quantitative studies (i.e. those who use some sort of statistical analysis, evidence of causal links cannot always be assumed, as it depends on the type of analysis.

- **Type of causal links:** Different scenarios are possible: DriverA → DriverB → Conflict or DriverA + DriverB = Conflict. In other words, impacts can be in a sequential or additive fashion. Most studies do not specify a pathway (as in A leads to B), hence when extracting drivers from literature it is difficult to know about the specific sequence of the causal chain
- **Directionality:** Drivers can be positively or negatively related to next driver / conflict, and different studies find contradicting results concerning the directionality of the same driver, e.g. rainfall scarcity increased or decreased the probability for pastoral conflict, depending on study
- There are **reciprocal effects** (feedback loops), i.e. conflict itself drivers other/more conflict either directly or indirectly via enforcing other drivers of conflict. Conflict also increases the vulnerability climate.
- **Positioning of climate (change) as driver:** Should climate be presented as main driver of conflict? Showing impact pathways between climate and conflict in form of a causal chain would imply that climate is the root cause on the one side and the problem symptom (conflict) on the other, while the links between the two ends are intermediate causes. Although presenting climate as a key factor for conflict would be favourable for our work, it has to be considered that
 - There is quite a number of studies claiming that there is most probably no causality between climate (change) and conflict, that it is not the main driver but an intermediate driver / amplifier of conflict, and that other drivers (low socioeconomic development, low capabilities of the state, intergroup inequality (for example, ethnic differences across groups) and recent history of violent conflict are much more influential.

It was hence decided that the goal of the visualization was not to give a detailed insight / demonstration of the causal chain/links between climate and conflict, but to conceptually frame a narrative on climate security in form a conceptual and simplified visualization (some kind of network graph), indicating that it only shows some potential links and that the directionality (pos./neg. effect) is variable etc. The conceptual visualization should also illustrate that interactions take place depending on institutional context and spatiotemporal scale, conflict emergences and intensity will vary. Four different [graph versions](#) (one presented below) with different complexity levels were drafted, of which three are presented on the webpage. The fourth, an interactive network might be used in the future.



Graph showing the network of second-order driver interactions in the context of the climate-conflict nexus. Conflict can be spurred by multidirectional and interactive effects including environmental, institutional/political, social, agronomic, or economic drivers (dashed grey lines). Examples for potential pathways include drivers with either positive (i.e. increasing), negative (i.e. decreasing) or additive (i.e. combined) effects on other drivers and / or conflicts (solid green arrows). Orange boxes indicate CGIAR's work on the prospects for peace.

1b) Portfolio analysis

For the [keyword search](#) via using keyword combinations, a total of 1188 search results were screened (by reading the abstract), of which 229 were [listed](#) along with other additional items shared by individual CGIAR contacts via Email for consideration for the portfolio database. The database comprises a total of 232 research items. [Raw data entry sheets, log books](#), the cleaned [master file](#) as well as a documentation for [data cleaning](#) and [processing](#) can be accessed via the shared [MS Teams folder](#) (restricted access). Some key information around the portfolio analysis are:

- The most frequent output type were journal articles ([Tab. 2](#)).
- The top three centers / CRPs found with most research contributions to climate security were IFPRI, CCAFS and CIFOR (Fig.1). Note: *The CGIAR center listed is not necessarily the project lead (this information was not available), but solely indicates the involvement in a research output*
- The top ten studied drivers were climate change adaptation and mitigation, adaptive capacity, climate change and variability, rural livelihoods and poverty, food insecurity, drought, weak governance, agricultural outputs, migration and displacement and water scarcity ([Fig. 2a](#)). Note: *The here presented drivers are based on the above described keyword search, aiming to find research contributions related to climate security. They do not make an assumption on the frequency of studied topics in CGIAR in general.*
- Among centers / CRPs contributing most to climate security, ICRAF's top studied drivers were migration and displacement, weak governance and food insecurity, CIFOR's were land ownership inequality and weak governance, and CCAGS were climate change and adaptation, climate change adaptation and mitigation and food insecurity ([Fig. 2b](#)).
- The most studies conflicts were violent and land and natural resource conflict ([Fig. 3a](#)). Note: *Not in all outputs a conflict was studied. CGIAR contributions to climate security were also considered as such if only a set of conflict drivers was addressed.*

- Among the top three center / CRPs contributing to climate security, ICRAF research mainly studied violent conflict and CIFOR mainly land and natural resource conflicts. CCAFS contributions generally focused fewer conflicts ([Fig. 3b](#)).
- The top ten countries where most research on climate security was found were: Mali, Ethiopia, Kenya, Tanzania, India, Uganda, Congo, Nigeria, Bangladesh and Sudan ([Fig. 4](#)). *Note: Many studies were conducted on regional levels, and not individual countries were mentioned.*
- Most of the studies were global or conducted for East or West African countries ([Fig. 5](#)).
- Few studies on climate security were conducted before 2011, and the number of research contributions has steadily increased since then ([Fig. 6](#)).
- The top three [contribution categories](#) were “Research to strengthen resilience”, “Research to understand conflict pathways” and “Partnerships, Engagement and strengthening institutions” ([Fig. 7](#)).
- A total of 308 research partners, including Universities, national and international research agencies, governmental and non-governmental institutions as well as other CGIAR centers were found. The top three partner locations were found in USA, UK and Kenya. *Note: A partner was defined as any collaborator listed on a research item and does not refer to project implementation partners or donors*

Table 2. Type and frequency of output types

OutputType	Freq
Journal articles	119
Working and discussion papers	32
Books, book chapter, manuals, guides	20
Tools	16
Policy and research briefs	15
Conference papers, abstracts and proceedings	11
Project report	11
Annual report	5
Scientific multimedia (data platforms, blogs, webpages)	4
Project description	3
Workshop report	3
Thesis	1

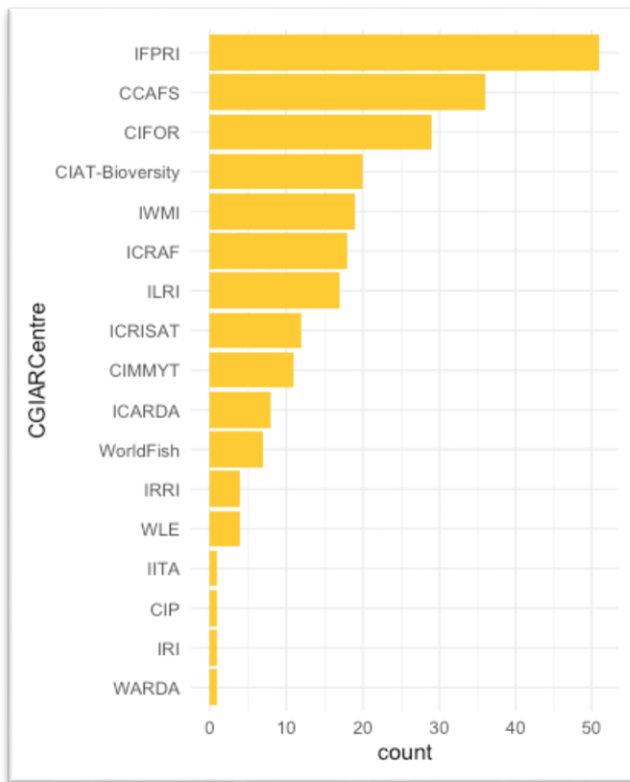
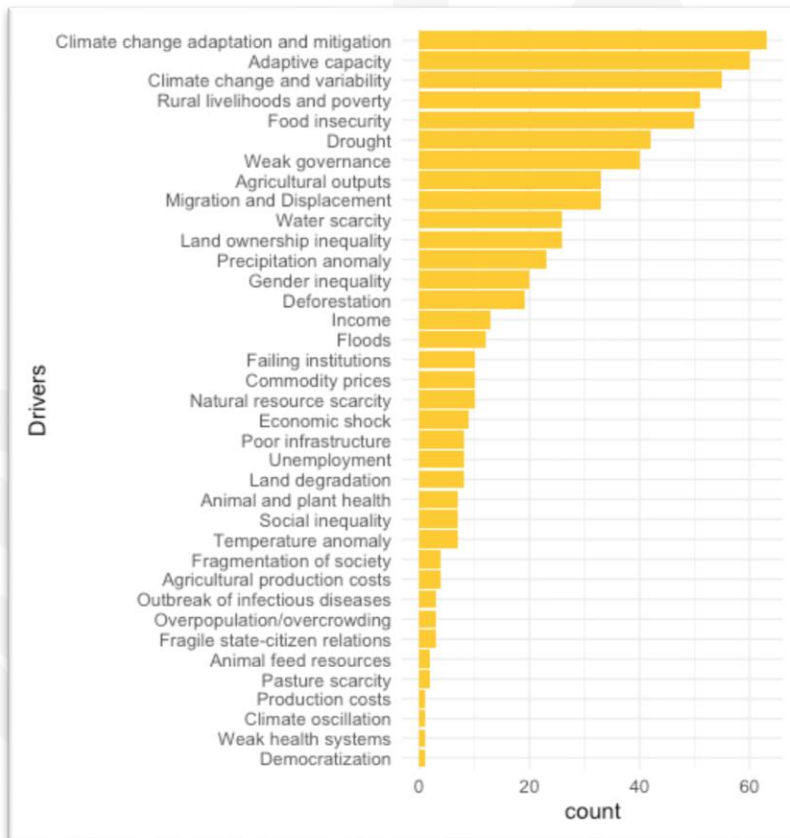


Fig. 1. CGIAR centers and CRPs contributing to climate security and peace based on portfolio analysis



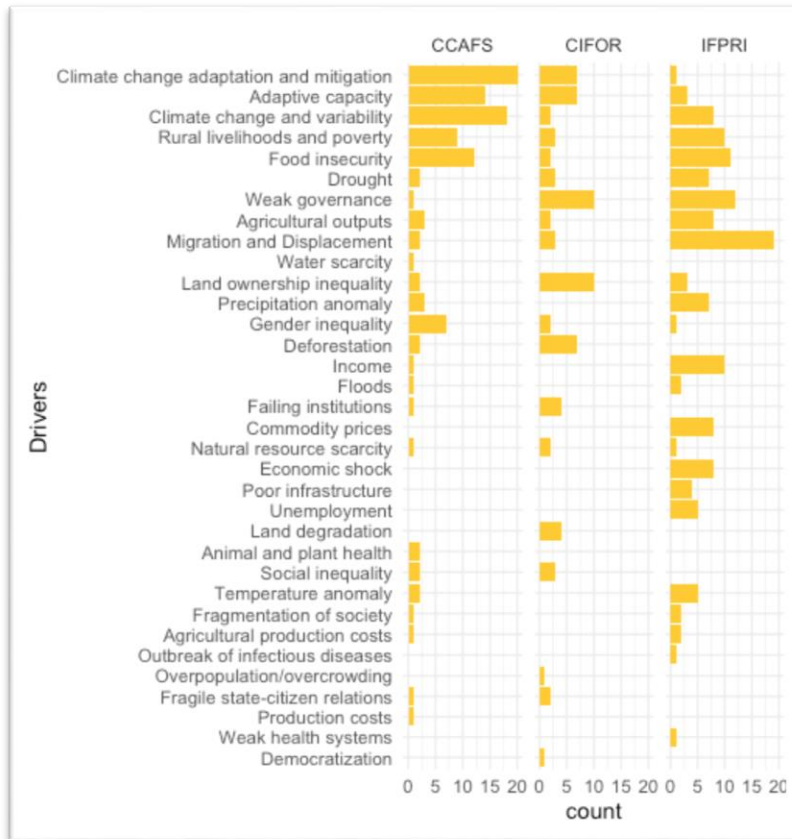
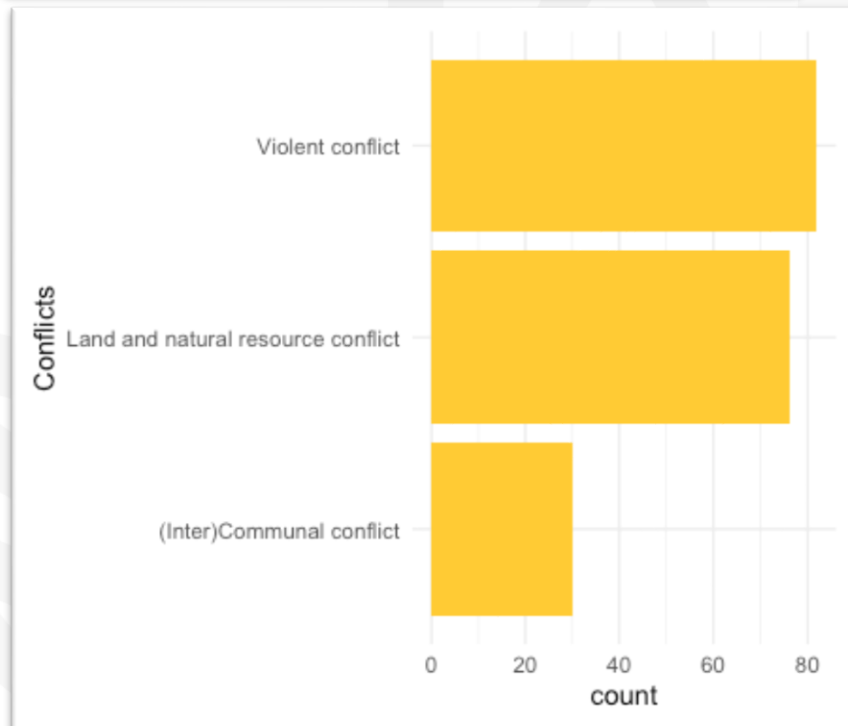


Fig. 2a. Studied drivers of conflict found in portfolio analysis. One research item could include multiple drivers. 2b. Studied drivers by top three CGIAR contributors



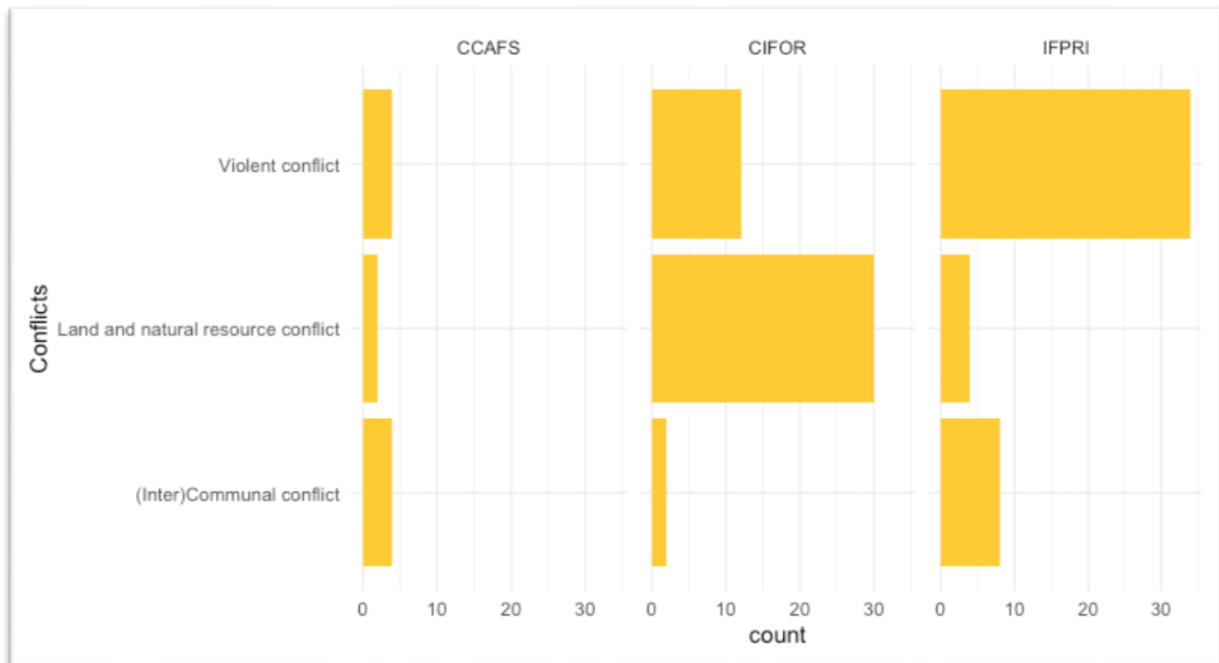


Fig. 3a. Studied conflicts found in portfolio analysis. 3b. Studied drivers by top three CGIAR contributors

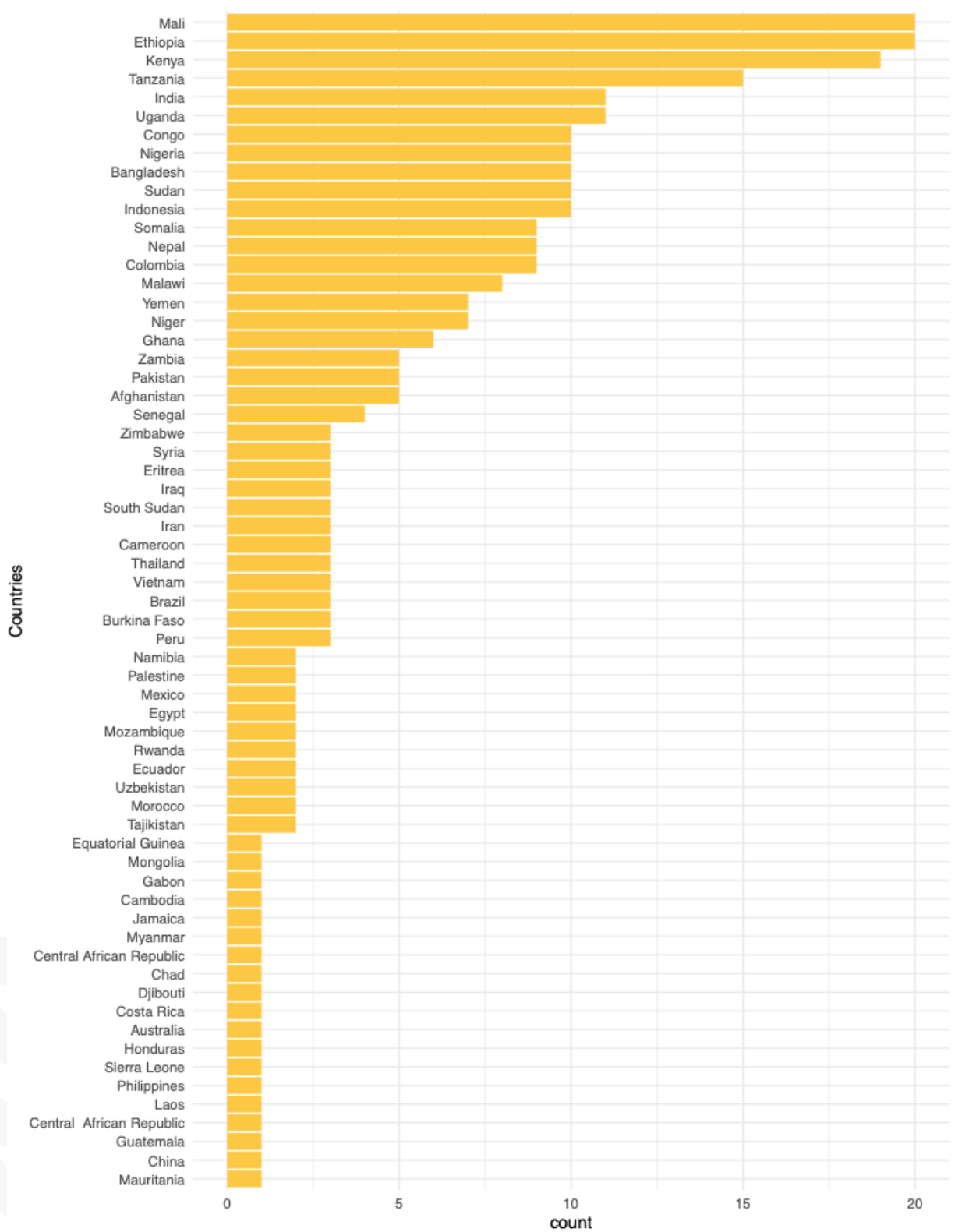


Fig. 4. Study locations

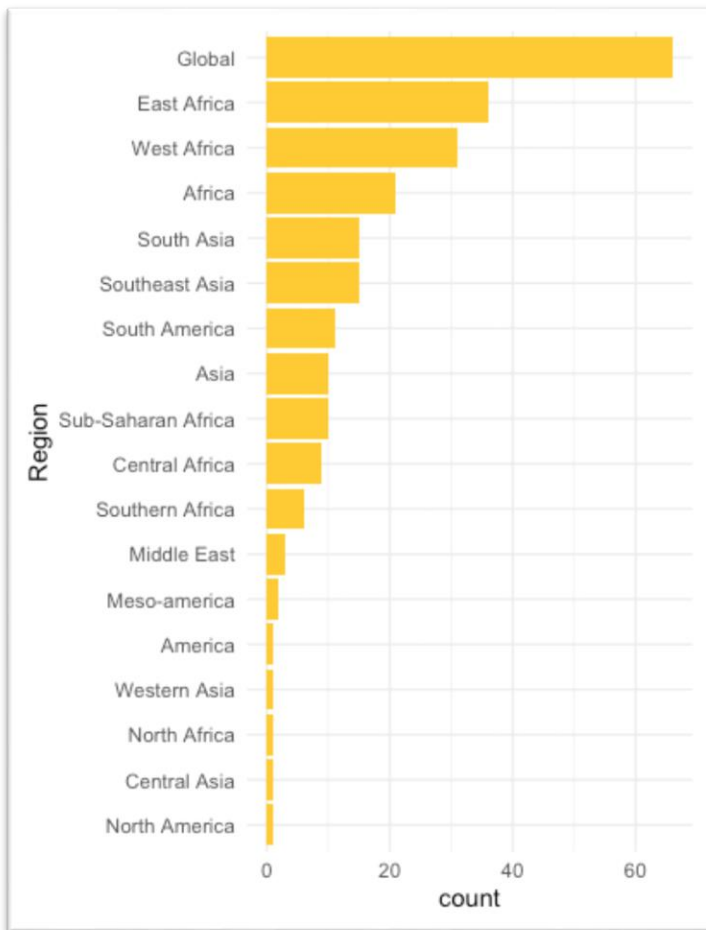


Fig. 5. Study regions

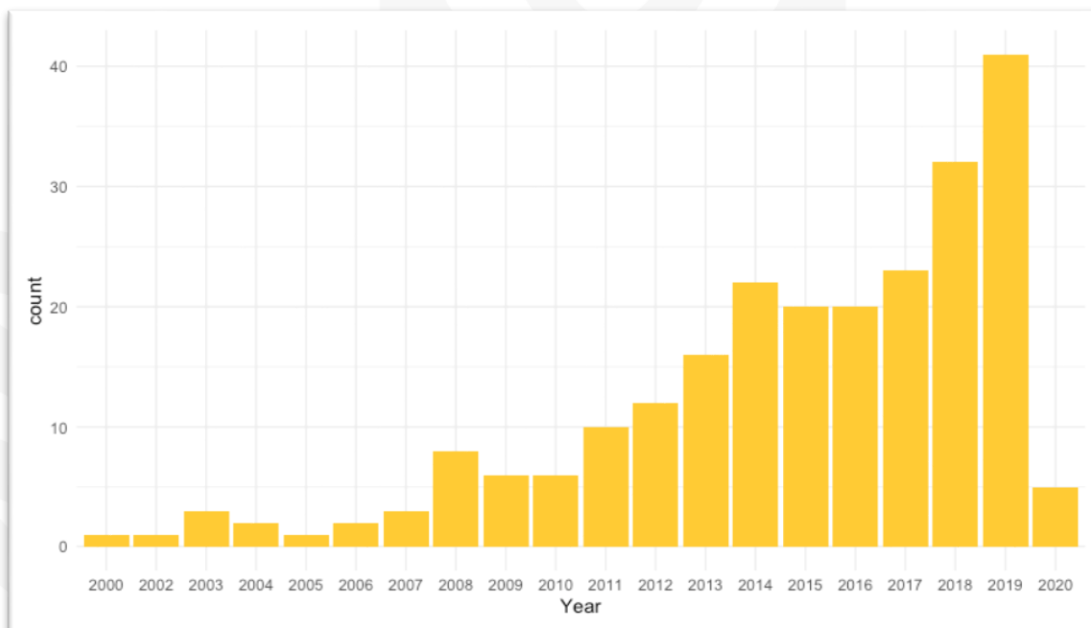


Fig. 6. Study years

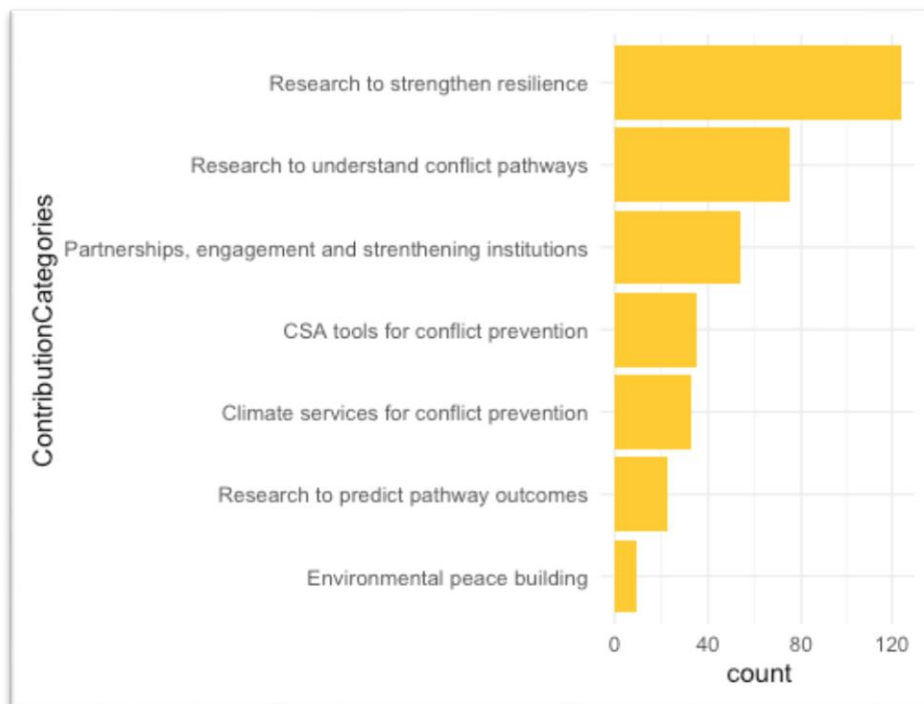


Fig. 7. Contribution categories

Involved staff and contacts

Name	Responsibility	Affiliation
Peter Läderach (PL)	Supervision, coordination, communication, feedback and revision	Alliance Bioversity - CIAT
Theresa Liebig (TL)	Planning and coordination, development of working process, methods, concepts, protocols and data frames, data management, data cleaning and processing, data entry and validation, development of website structure and coordination with developer, development of driver interaction graphs, reporting	External consultant for the Alliance Bioversity - CIAT
Nam Nguyen (NN)	Brainstorming for methods, working process, concepts and website content, communication, data entry and validation, feedback and revision	Alliance Bioversity - CIAT
Ewaut Kissel (EK)	VPS configuration, server maintenance package for 1 year, development of webpage	External consultant
Sarah Quinn (SQ)	Data entry	University of Galway
Lalmangaih Zuali (LP)	Data entry	University of Galway
Climate security team	Feedback and revision	Alliance Bioversity - CIAT

Software and source file access

Software	Excel: Data entry
	Mendeley (desktop): Literature review
	R: Duplicate checking, data processing, descriptive analysis, interactive network
	MS teams & Skype: Communication
	Canva: Layout and design of communication products
	Draw.io: Conceptual graphs
	Bitbucket: Version control and sharing of website back- and frontend code
Files & documents	
CSPortfolioDatabase_yymmdd.xls	Cleaned Masterfile: Database for literature and CGIAR contributions. File maintained and populated by TL
CSPortfolioDatabaseXY_yymmdd.xls	Raw data files: Data frames populated with data from literature review and CGIAR contributions. Each collaborator has his/her own file (XY stands for initials of contributor, NN, TL, SQ or LP)
LitRevCSPathways_yymmdd.xls	List of reviewed literature items
ClimateSecurityLiteratureReview.xls	Database for literature review
urlList_yymmdd.xls	List of CGIAR contributions to be used to extract data
KeywordSearch_yymmdd.xls	Results of keyword search
LogBookXY_yymmdd.xls	Logbooks of each collaborator to record and document questions, things to change/add/clarify. To be used on a daily basis
PortfolioAnalysisPlan_yymmdd.docx	Description/documentation of working process for portfolio analysis
Source file access	
Canva	Infographic
	2-pager
	4-pager
Draw.io	Driver interaction graph 1
	Driver interaction graph 2
	Driver interaction graph 3
Bitbucket	Invitation shared via email with PL and NN by EK

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