

How Robust is the Evidence on Climate Security? An Assessment of Confidence Levels in IPCC Reports via the SCIPCC Dashboard.

Cesare M. Scartozzi

Introduction

The Intergovernmental Panel on Climate Change (IPCC) is an international organisation, operating under the umbrella of the United Nations (UN), mandated to gather and disseminate scientific information on anthropogenic climate change. The IPCC is composed of three working groups and a task force, which produce assessment reports on various aspects of climate change using available scholarship. The work of the IPCC is highly relevant as it provides an authoritative synthesis of emerging scientific literature that serves as a baseline for climate negotiations.

The Second Working Group (WGII) of the IPCC is tasked with reviewing the literature on climate change impacts, adaptation, and vulnerability. Its reports have become increasingly relevant over time, especially after the Paris Agreement in 2015, as there is mounting evidence that mitigation will not be enough to counter global warming in the short term. The lowest stabilisation pathways included in IPCC reports are highly reliant on negative emission technologies which have yet to be operationalised. This means that, even in our best-case scenario, we will overshoot emission targets in the near future. In other words, things will *surely* get worse before they *may* get better. Hence, we will have to adapt.

As climate change increasingly affects socio-ecosystems, questions have begun to arise about its impact on security. In recent years, as documented by Scartozzi, literature on climate security has grown rapidly and produced mixed evidence.ⁱ Altogether, scholars have tried to assess the broad impact of climate on human security, interpersonal violence, inter- and intra-state conflict, and peace. The overall body of literature is highly heterogeneous and difficult to synthesize. Altogether, it appears that there is strong evidence of a link between climate change and security, but this link is complex, multi-faceted, and highly contextual.

Given the variance in the findings and lack of consensus, the reporting of the WGII on climate security has become a highly anticipated appointment. Even though the IPCC does not add new findings to the literature, its reporting is perceived as highly authoritative and prescriptive. Statements made by the IPCC take on a life of their own and have a direct influence on policymaking, both in the areas of climate negotiations and in the maintenance of international peace and security. The recent interest in climate security by the UN Security Council has only made the WGII climate security reporting more relevant from a policy perspective.ⁱⁱ

To mark its relevance, every IPCC report is followed by a plethora of scientific and policy articles. For example, following the Fifth Assessment Report (AR5), Gleditsch and Nordås published a peer-reviewed article that assessed the reporting on climate-security in IPCC reports.ⁱⁱⁱ Their essay summarised the work of the WGII and highlighted research gaps and problems with the use of sources. Likewise, after the recent publication of the AR6, numerous articles (including one by Tobias Ide and one by Volker Boege published by the Toda Peace Institute) have investigated the reporting on climate security and synthesized its evidence.^{iv} Yet, despite all the scrutiny, little attention has been paid to the scientific uncertainty of the IPCC reporting.

This Policy Brief aims to fill existing research gaps and discuss the temporal and thematic evolution of confidence levels in WGII's climate security reporting. Since AR4, the IPCC has been assigning a level of scientific uncertainty to each substantive statement in its reports. Using a novel application of natural language processing, this study extracted all the statements on climate security for the AR5 and AR6 reports and categorised them based on their scientific uncertainty. As a result, the study was able to assess IPCC confidence levels in climate security literature over time and across topics. The climate security statements were also made available online via an open-access interactive dashboard called *Scientific Uncertainty in IPCC* (SCIPCC). The dashboard, which has been created in support of this article, can be used by the readers to further investigate scientific uncertainty in the work of the IPCC.^v

Contextualising the IPCC and Scientific Uncertainty

IPCC reports, which are years in the making, are the product of a collective effort between scientists, experts, and governments. In the early years, the link between the organisation and policymaking was tighter than what it is today. The organisation delved into advocacy, and, as Beck noted, it played a key role in the creation of the UN Framework Convention on

Climate Change (UNFCCC) and in the making of the Kyoto Protocol.^{vi} Following the Third Assessment Report (TAR), the IPCC began setting boundaries for its political engagement. This process of neutralisation was further accelerated in 2009 when so-called Climategate¹ challenged the legitimacy of the institution.

Since the drafting of the AR4, the IPCC has made it clear that it aims to provide neutral knowledge that can be acted upon by UN member states in climate negotiations. As stated on its website, the IPCC defines its reports as "neutral" or "policy-relevant but not policy-prescriptive."^{vii} What this means, in practical terms, is that the reports aim to inform policy, not direct it. Of course, this is easier said than done, as knowledge is always political. Beck and Mahony have written several articles on the matter, highlighting how even a balanced scientific reporting will always have a performative power insofar as its content (just by being there) will shape the realm of political possibility.^{viii}

The problem of neutrality has been tackled by the IPCC in a rather reductive fashion – first, by using an inclusive and collaborative approach to the drafting of its reports and, second, by increasing the transparency of its findings. To this end, as noted by Risbey and Kandikar, the IPCC started with the third assessment cycle to formally state the uncertainty of its evidence.^{ix} The uncertainty communication process was then revamped with the fourth assessment cycle when the organisation published a new set of guidelines for its authors. According to these guidelines, the uncertainty of its statements can be assessed as a measure of likelihood and/or level of confidence. The first measure, likelihood, is meant to be a quantitative assessment of the probability of an event or outcome. As such, an assessment of likelihood can only be made when the findings in the scientific literature are quantifiable and comparable. The second measure, confidence, is a measure of the quality of scientific evidence (robust, medium, and limited) and the degree of scientific agreement (high, medium, and low) (see Image 1). In other words, it's a subjective measure of the IPCC author's "confidence in the validity of a finding, based on the type, amount, quality, and consistency of evidence."^x

Image 1. Confidence levels^{xi}

| | | | |
|-------------|--|--|---|
| Agreement ↑ | High agreement Limited evidence (Medium Confidence) | High agreement Medium evidence (High Confidence) | High agreement Robust evidence (Very High Confidence) |
| | Medium agreement Limited evidence (Low Confidence) | Medium agreement Medium evidence (Medium Confidence) | Medium agreement Robust evidence (High Confidence) |
| | Low agreement Limited evidence (Very Low Confidence) | Low agreement Medium evidence (Low Confidence) | Low agreement Robust evidence (Medium Confidence) |
| | Evidence → | | |

¹ More than 1,000 e-mails between scientists at the Climate Research Unit of the U.K.'s University of East Anglia were stolen and made public by an as-yet-unnamed hacker. Climate skeptics wrongfully claim that they show scientific misconduct that amounts to the complete fabrication of man-made global warming.

According to the guidelines, IPCC's authors should mention confidence levels when findings have at least high agreement or robust evidence. Alternatively, they are encouraged to mention the combination of evidence and agreement (e.g., medium evidence, low agreement). Also, authors are recommended to treat findings with low evidence and agreement with extra caution, and only present them as "areas of major concern" pending an appropriate explanation. Finally, the guidelines remark that confidence levels should not be interpreted probabilistically, as they are ultimately a subjective measure based on expert assessments.

Methodology

This study quantitatively analyses confidence levels in climate security findings across the WGII AR5 and AR6 reports. Earlier reports were not taken into consideration for practical and substantive reasons. The analysis was developed in Python using various libraries for natural language processing. The reports were first downloaded as PDFs and then converted into a homogeneous digital format. Then, the text was pre-processed and cleaned. The IPCC reports contain numerous tables, images, and headers. For this reason, particular attention was paid to making sure the formatting was congruous to the original files. The text was then labeled, using the documents' metadata, and parsed into a unified dataset. Finally, to allow for statistical analysis, irrelevant content is removed from the text (e.g., stop words such as 'the', 'and'), which is then stemmed, lowercased, and lemmatized.²

To identify relevant content, each report was tokenized³ into a list of sentences. Sentences containing confidence levels were then extracted and grouped into a sub-corpus. The confidence levels were automatically extracted and assigned to the sentences in the form of metadata. When sentences contained only statements on agreement and evidence, the confidence level was assigned based on the scale shown in Image 1. For example, findings with high agreement and limited evidence were labeled as having medium confidence, while findings with low agreement and medium evidence were labeled as low confidence. Finally, the sentences were further filtered using a bag of tokenized words related to climate security (i.e., conflict, violence, tension, peace, security) to select only content relevant to climate security.

As a result of this approach, it was possible to generate a list of climate security findings for each IPCC report, with each finding linked to a series of metadata describing source (report name, year), confidence level, the topic. This information was then used to make quantitative analyses of confidence levels across time and topic areas. Visualisations were made using various Python libraries and Gephi.^{xiii} The overall dataset has been made available to the public as an interactive dashboard so that interested readers can further explore WGII statements across confidence levels. The online dashboard was compiled using Scattertext.

² Stemming refers to reducing words to their word stem and lemmatization refers to grouping together different forms of the same word.

³ Tokenization is the separating of a piece of text into smaller units called tokens.

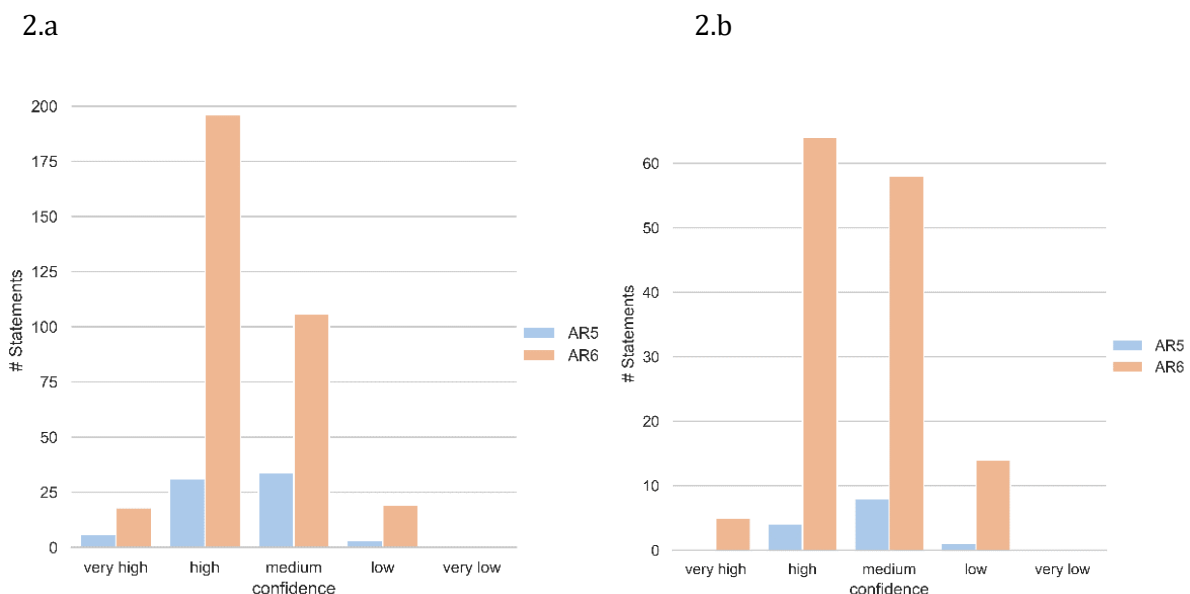
Findings

Confidence Levels over Time

This section looks at macro trends in confidence levels across the past two WGII assessment cycles. Given the rapid growth of publications in the field of climate security, we expect the AR6 report to include more findings and, potentially, have a higher degree of certainty than previous reports (assuming that more findings will lead to more robust evidence). Image 2 shows the total number of findings on climate security across the latest two reports divided into confidence levels. Image 3 shows the distribution of findings via a density plot. Images 2.a and 3.a plot findings relating to security while Images 2.b and 3.b plot findings relating only to conflict, violence, and peace.

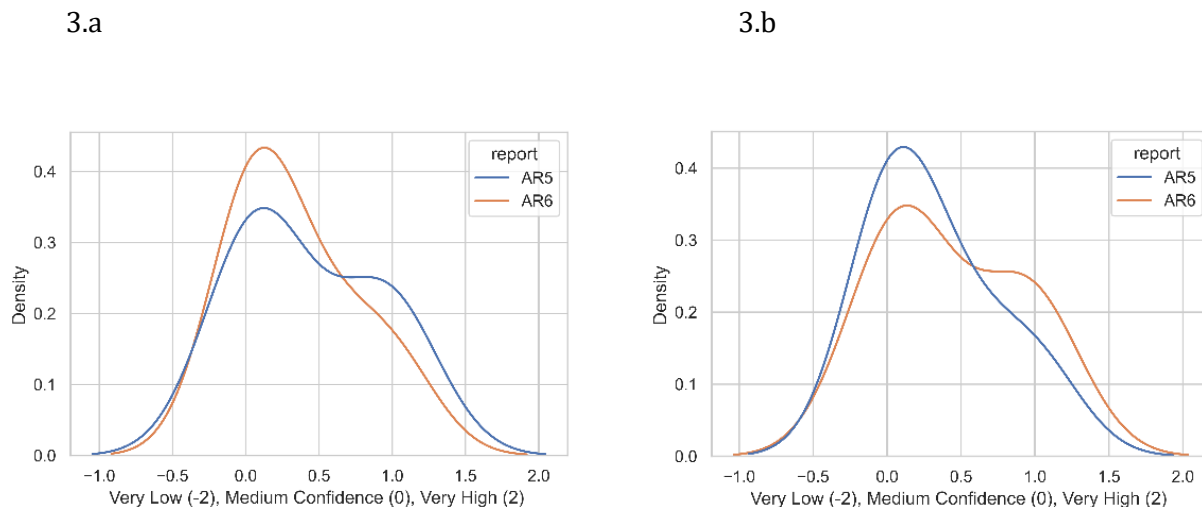
As can be seen in the Image 2.a, reporting on climate security in the AR6 report has increased almost 4.5 times (a total of 81 statements in AR5 vs 358 in AR6). However, the distribution of confidence levels has not moved significantly. Instead, as it can be seen in Image 3.a, it appears that the overall distribution curve has moved slightly toward the center (medium evidence). When restricting the corpus of text to statements on peace, violence, and conflict, the findings in Image 2.b show a slightly different picture. Here, the reporting in the AR6 has increased twelvefold (12 statements in AR5 vs 148 in AR6) and the confidence levels have noticeably increased (see Image 3.b). Finally, it is worth noting that while AR5 has no findings labeled as very high and only four labeled as high, the AR6 has respectively five and 64.

Image 2. Confidence of findings related to 2.a) climate security and 2.b) conflict, violence and peace.⁴



⁴ Image 2 plots on the x-axis the confidence levels of AR5 and AR6 and on the y-axis the total number of statements related to climate security (image 2.a) and conflict, violence and peace (image 2.b).

Image 3. Density of confidence levels of findings related to 3.a) climate security and 3.b) conflict, violence and peace.⁵



From the analysis of confidence levels, there are a few key observations that can be made.

First, as shown by Image 2, the WGII has increased its reporting on climate security in absolute numbers but, in relative numbers, the reporting has not increased significantly. While climate security accounted for 5.23 percent of all the findings in AR5, it accounted for 5.88 percent in AR6. Hence, while on appearance it might seem that the IPCC is giving more space to climate security literature, data show otherwise.

Second, confidence levels for the climate security literature have slightly decreased, while confidence in the literature on peace and conflict has slightly increased. The first observation is difficult to interpret but can be partially attributed to the broadening of the climate security scholarship, which has increasingly expanded into new research areas. The lower aggregate confidence level is likely reflective of the novelty of some of the branches in the scholarship. Regarding the conflict and peace literature, the slight increase in confidence levels can be partially attributed, as argued by Ide,^{xiii} to an overall increase in the maturity of the scholarship as well as to better use of sources by the IPCC.

Third, both AR5 and AR6 appear to have a bias toward reporting findings with medium to high confidence levels. As previously mentioned, IPCC authors' guidelines warrant caution in the reporting of findings with *very low* confidence levels. This is understandable as low evidence and low agreement statements are hardly of interest to the general public. Giving these findings space would only provide a platform for potentially immature or flawed research. However, the under-representation of *low confidence* findings is somewhat

⁵ The density plot allows to observe the distribution of confidence levels in the IPCC reports. The peaks in the plot show where values are concentrated in AR5 and AR6. Image 3.a plots confidence assigned by the IPCC to statements on climate security, while image 3.b shows confidence levels of statements related to conflict, violence and peace.

lamentable as its ends up discounting low agreement and medium evidence findings. Just as the presence of a finding in the IPCC shapes the realm of political possibility,^{xiv} so does its absence.

Confidence Levels Across Topics

This section focuses on the distribution of confidence levels across topics in AR6, briefly discussing AR5 to provide better context. Previous reports are not taken into account as they did not engage in a meaningful way with climate security. Images 4.a and 4.b show the evolution over time of selected keywords across reports. What can be seen in the figure is a generally positive trend in the use of climate security wording, which corroborates the observations made in the previous section. The only unexpected finding is the overall decrease in the use of the term 'human security' between AR5 and AR6. Looking at the two reports in detail, it appears that the overall broad and open-ended construct of human security has been addressed more precisely in AR6 via its sub-categories. So, whereas AR5 was using the umbrella term of human security, AR6 references 'health', 'food security', and 'livelihoods'. This difference in the use of language can also be observed in Image 5, which tabulates the most frequent words across statements on climate security in AR5 and AR6.

Image 4. Word Frequencies across AR4, AR5 and AR6.

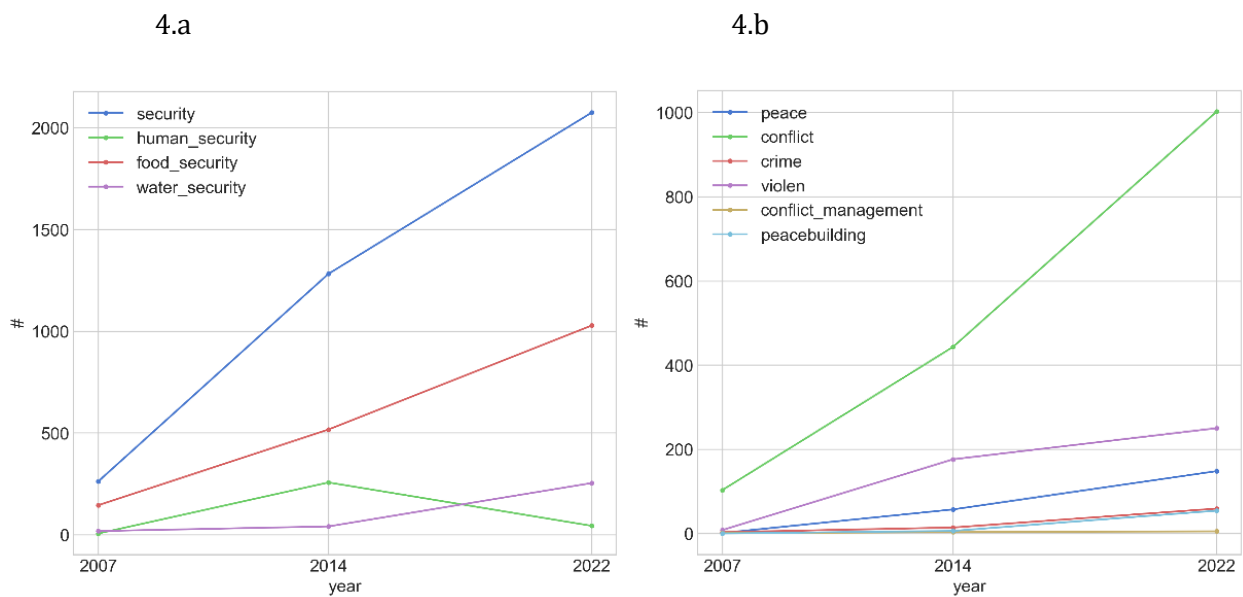
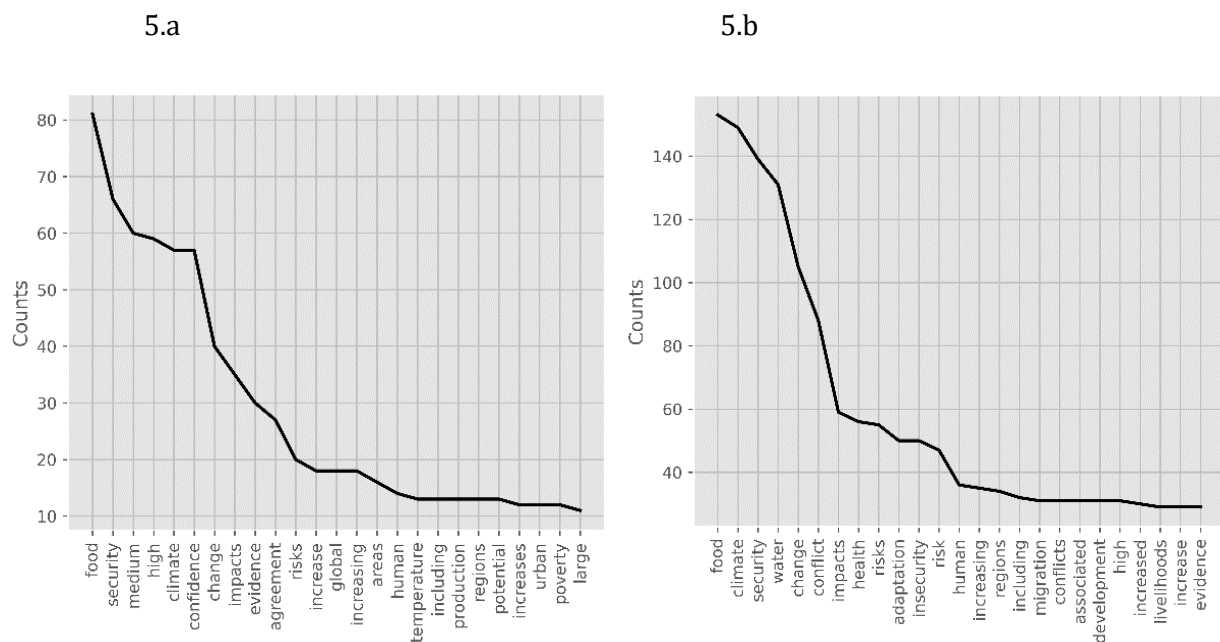


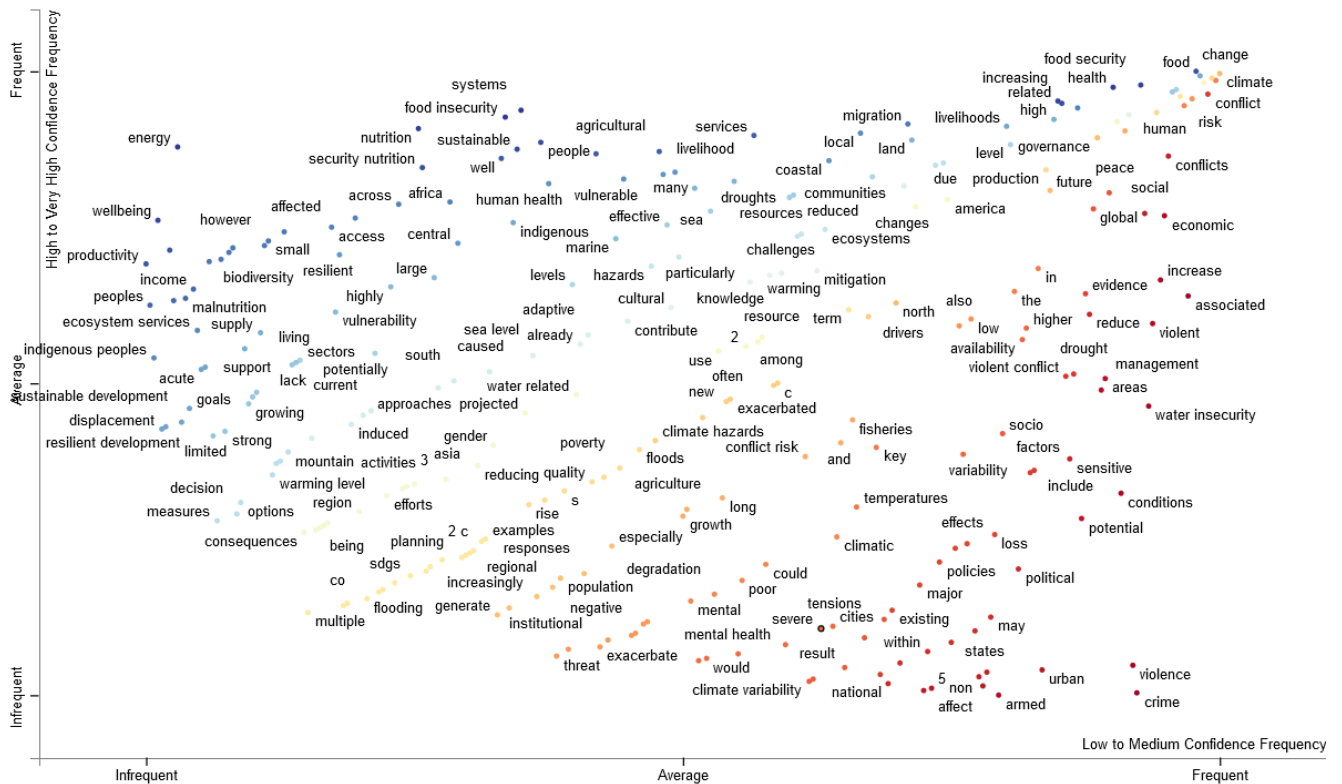
Image 5. Word Frequency in a) AR5 and b) AR6



An in-depth discussion of the findings of AR5 is beyond the scope of this Policy Brief and can be found in Gleditsch and Nordås.^{xv} Here it is worth remarking that high confidence findings in AR5 were mostly related to human security while findings about conflict were instead assigned medium confidence levels. These findings included various statements on climate change as a risk multiplier as well as statements on the conflict potential of climate policies and on the impact of conflict on climate vulnerability. For example, AR5 reported with medium confidence levels that:

climate change can indirectly increase risks of violent conflicts in the form of civil war and inter-group violence by amplifying well-documented drivers of these conflicts such as poverty and economic shocks" and that "in numerous statistical studies the influence of climate variability on human conflict is large in magnitude." Interestingly, it also noted with medium confidence that climate policies, such as incentives to move to biofuels and afforestation projects have significant secondary impacts, such as "increasing conflicts for scarce resources."^{xvi}

Image 6. Word Frequencies Plotted by Confidence Levels.⁶

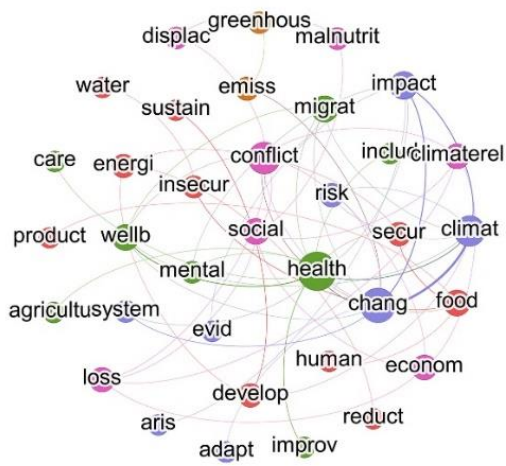


Moving to AR6, it can be helpful to look at Images 6 and 7, which respectively show the frequency of words distributed across confidence levels, and the co-occurrence networks for the climate security statements. Image 6 is particularly effective in visualising the quality of the evidence on climate security. In the image, WGII statements are divided into two sub-corpora: high and very high confidence levels, and low and medium levels. The y-axis plots the frequency of words contained in the former, the x-axis plots the frequency of the latter. Words near the y-axis are from statements that are backed by only strong evidence while words near the x-axis are from statements with incomplete evidence or no consensus. Words in the middle are from statements that have mixed evidence (e.g., some high and some low confidence statements). Also, the further the words are to the origin point, the higher is their frequency in the climate security corpus.

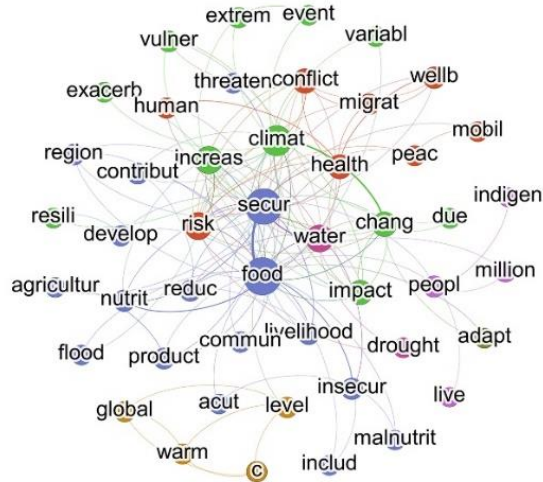
⁶ The y-axis plots the frequency of words from statements with high and very high confidence levels, the x-axis plots the frequency words. The further the words are to the origin point, the higher is their frequency in the climate security corpus.

Image 7. Word co-occurrences among statements with different confidence levels.

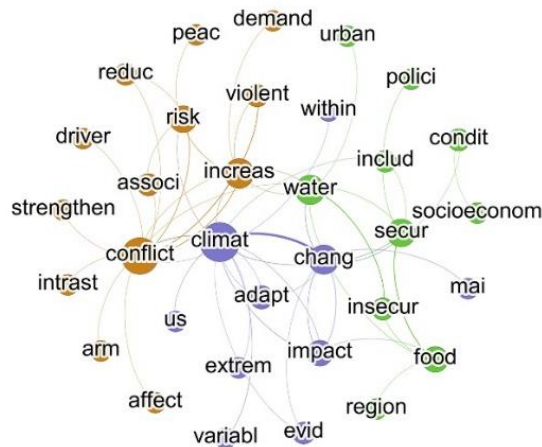
Very High Confidence



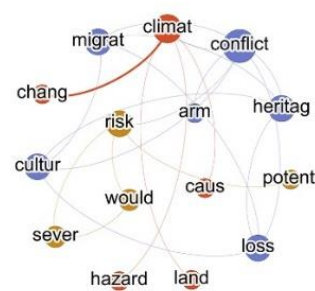
High Confidence



Medium Confidence



Low Confidence



Looking at the high to very high statements in Images 6 and 7, we see various thematic groups of words: one related to human security (wellbeing, livelihoods, income, food insecurity, nutrition, displacement, etc), one to vulnerable people (indigenous people), and another to locations (Africa, Arctic). What this means is that there is strong evidence of a link between climate change and human security, in particular in relation to specific vulnerable populations and geographies. For instance, the report states with high confidence that "climate change increases the threat of chronic and sudden onset development challenges, such as poverty traps and food insecurity" and that "extreme climate events have been key drivers in rising acute food insecurity and malnutrition of millions of people requiring humanitarian assistance in Africa." Other high confidence statements argue that "climate hazards are a growing driver of involuntary migration and displacement" and that "even with moderate climate change people in vulnerable regions will experience a further erosion of livelihood security that can interact with humanitarian crises, such as displacement and forced migration." ^{xvii}

Moving right into Image 6, we start to see words that are featured in both corpora (high to very high, and low to medium confidence statements). For instance, "gender-based approaches" are said to provide "novel underutilized pathways to achieving sustainable peace" (high confidence) and "reduce the risk of intergroup conflict in climate-disrupted areas" (medium confidence). Conflict, which can be seen in the top right corner of the scatterplot, is equally balanced between corpora. Climate hazards are said to be "a contributing factor to violent conflict" (high confidence), yet the report also points out that "future violent conflict risk is highly mediated by socio-economic development trajectories" and non-climatic "drivers of conflict, including lack of natural resource use regulations, societal exclusion, poor infrastructures and a history of violent conflict (high confidence). Altogether, the WGII argues with medium confidence that "future increases in conflict-related deaths with climate change have been estimated, but results are inconclusive," which helps to explain the position of the word 'conflict' in the scatterplot.

Finally, moving near the x-axis, we find words from statements that only have medium to low confidence levels. High-frequency words in this area of the graph include 'crime', 'violence', and 'armed'. Statements on crime argue, with low confidence, that "studies of crime statistics in the US have revealed a relationship between temperature and a range of violent crimes including aggravated assaults, rapes, and homicides" but at the same time "the overall effects of climate change on crime and violence in North America are not well understood" (medium confidence). Interpersonal violence is discussed predominantly in relation to domestic and gender violence. For instance, it is stated with medium confidence that water insecurity is linked to domestic violence and that "climate hazards are associated with increased violence against women, girls and vulnerable groups."

A comprehensive summary of all the climate security findings listed by the IPCC is beyond the scope of this Policy Brief. However, interested readers are invited to check the scatterplot and the underlying dataset, which were made available online in the SCIPCC dashboard.⁷ Users visiting the online dataset can search for words or select them on the plot and see all the WGII statements, divided by confidence levels, in which the word is featured. The plot aims to provide a quick and effective way for identifying relevant findings, assessing their confidence levels, and comparing them.

Final Remarks

This study set out to investigate the temporal and thematic evolution of confidence levels in WGII's climate security reporting. The investigation has shown that from the AR5 to the AR6 cycle, confidence levels in climate security scholarship have slightly decreased while confidence levels in climate conflict scholarship have slightly increased. At the same time, statements containing evidence on climate security and conflict in AR6 have increased since AR5 by, respectively, 4.5 times and twelvefold. In relative terms, however, the coverage of climate security has not grown much, as in AR5 it accounted for 5.23 percent of all the findings while in AR6 it accounted for 5.88 percent.

⁷ Scartozzi, Scientific Uncertainty in IPCC dashboard (SCIPCC), https://scartozzi.eu/ipcc_ar6_climate_security_dashboard/

Looking at the topics, the study has found that statements pertaining to human security (e.g., wellbeing, livelihoods, income, food insecurity, nutrition, and displacement) tend to have high to very high confidence levels, whereas statements on interpersonal violence and crime tend to be assessed with low to medium confidence levels. The study has also found many topics which have mixed and, at times, contradictory confidence assessments. These topics include conflict, conflict drivers, conflict risks, conflict resolution mechanisms, and peace.

Altogether this study has presented a few interesting and novel results. First, looking at the evolution of the last two assessment report cycles, it seems that more scholarship does not automatically lead to more robust evidence. Following a strictly positivist view of science, we would expect an increase in scientific output to lead to a decrease in scientific uncertainty. Nonetheless, in some topic areas, IPCC confidence levels have remained stationary or even decreased over time. A second finding is that the IPCC is talking more about climate change and security, but not in relative terms (i.e., vis-à-vis other topics).

A third finding is that the IPCC has a strong bias toward reporting findings with medium to high confidence levels. As discussed, the under-representation of low confidence findings is somewhat problematic since it ends up discounting low agreement and medium evidence findings. Even though the IPCC strives to be neutral, its reports are highly influential on policymaking. Just as the presence of a finding in the IPCC shapes the realm of political possibility,^{xviii} so does its absence.

Recommendations for Researchers and Practitioners

First, in addition to the discussions outlined in this Policy Brief, researchers can navigate the SCIPCC dashboard to identify what research areas require more robust evidence or more agreement. For example, the dashboard shows that research on climate and mental health, interpersonal violence, and conflict-sensitive adaptation requires more robust evidence (i.e., more thorough studies). Research on conflict (which is already abundant) requires more agreement among scholars. To this end, literature on conflict and peace would greatly benefit from collaborative approaches aimed at creating a broader consensus.

Policymakers should also take stock of IPCC confidence levels to inform climate and security policies. For example, there is strong evidence to warrant actions aimed at preserving and protecting human security. As shown by the SCIPCC dashboard, the evidence of the negative impact of climate on public health and livelihoods is well documented. Likewise, there is strong evidence that vulnerable populations (i.e., women and indigenous people) and geographies (i.e., Africa and the Arctic) will be disproportionately affected by the climate security nexus. Policymakers should interpret the high confidence levels of the IPCC on human security as a call for action. The science is clear. Ignoring it, will only exacerbate insecurities and harm the most vulnerable.

Practitioners should also note that findings from some research areas in the field of climate security are still unexplored, inconclusive, or not generalisable. For example, policymakers should be cautious about operationalising evidence on inter-personal violence, mental health, and crime. As the SCIPCC dashboard shows, there are insufficient studies or robust

evidence in these areas to inform policy. This does not mean that no action should be taken. Precautionary policies could be adopted if practitioners have access to local and contextual evidence that can complement scientific research. Moreover, practitioners should look at areas of limited evidence and medium agreement as potentially relevant, and further invest in research and resource gathering.

Finally, as shown by the SCIPCC dashboard, we find areas where there are numerous studies, with an aggregate mixed robustness of evidence and mixed levels of agreement (i.e., high to low). One key area that has these characteristics is the one pertaining to climate change and conflict. Here, the mixed evidence warrants action under a precautionary principle but, at the same time, also demands extreme caution. Conflicting evidence and fluctuating confidence levels show that the link between climate change, conflict and peace is highly complex, contextual, and circumstantial. Practitioners operating in the field should therefore avoid making broad generalisations and relying on previously conceived assumptions. Instead, peace and conflict should be assessed on a case-by-case basis, integrating scientific evidence with locally produced knowledge.

In conclusion, the main takeaway from this study should be that scientific uncertainty greatly varies across findings in the field of climate security. For this reason, climate security should not be treated as a cohesive field of study, but rather as an ensemble of research agendas that are still very much a work in progress. The SCIPCC dashboard helps us make sense of these research agendas from the perspective of scientific uncertainty. In highlighting the robustness of evidence and the levels of agreement, the IPCC aimed to increase the transparency and quality of its reporting. This information, however, can also be used, as shown by this article, to help scholars and practitioners to focus efforts where needed.

The Author

Cesare Scartozzi is a researcher and consultant on climate change, public policy, and non-traditional security. He holds a PhD in Public Policy from the University of Tokyo. A list of his publications is available at www.scartozzi.eu.

Toda Peace Institute

The **Toda Peace Institute** is an independent, nonpartisan institute committed to advancing a more just and peaceful world through policy-oriented peace research and practice. The Institute commissions evidence-based research, convenes multi-track and multi-disciplinary problem-solving workshops and seminars, and promotes dialogue across ethnic, cultural, religious and political divides. It catalyses practical, policy-oriented conversations between theoretical experts, practitioners, policymakers and civil society leaders in order to discern innovative and creative solutions to the major problems confronting the world in the twenty-first century (see www.toda.org for more information).

Contact Us

Toda Peace Institute
Samon Eleven Bldg. 5th Floor
3-1 Samon-cho, Shinjuku-ku, Tokyo 160-0017, Japan
Email: contact@toda.org

Sign up for the Toda Peace Institute mailing list:

<https://toda.org/policy-briefs-and-resources/email-newsletter.html>

Connect with us on the following media.

YouTube: @todapeaceinstitute3917

Twitter: <https://twitter.com/TodaInstitute>

Facebook: <https://www.facebook.com/TodaInstitute/>

ⁱ Cesare M. Scartozzi, “Reframing Climate-Induced Socio-Environmental Conflicts: A Systematic Review,” *International Studies Review* 23, no. 3 (2021): 696–725.

ⁱⁱ Cesare M. Scartozzi, “The UN Security Council at a Turning Point: Securitisation or Climatization?,” Toda Peace Institute, March 13, 2021, <https://toda.org/global-outlook/the-un-security-council-at-a-turning-point-securitisation-or-climatization.html>; Cesare M. Scartozzi, “Climate Change in the UN Security Council: An Analysis of Discourses and Organizational Trends.,” *International Studies Perspectives*, 2022. <https://doi.org/10.1093/isp/ekac003>.

ⁱⁱⁱ Nils Petter Gleditsch and R Nordås, “IPCC and the Climate-Conflict Nexus,” *IOP Conference Series: Earth and Environmental Science* 6, no. 56 (February 1, 2009): 562007, <https://doi.org/10.1088/1755-1307/6/56/562007>; Nils Petter Gleditsch and Ragnhild Nordås, “Conflicting Messages? The IPCC on Conflict and Human Security,” *Political Geography* 43 (November 2014): 82–90.

^{iv} Volker Boege, “The Latest IPCC Report: No Good News for Pacific Islands Countries,” Toda Peace Institute, accessed April 7, 2022, <https://toda.org/global-outlook/the-latest-ipcc-report-no-good-news-for-pacific-islands-countries.html>; Tobias Ide, “What Do We Know About Climate Change, Peace and Conflict?,” Toda Peace Institute, accessed April 7, 2022, <https://toda.org/global-outlook/what-do-we-know-about-climate-change-peace-and-conflict.html>.

^v Scartozzi, Cesare M. “Scientific Uncertainty in IPCC (SCIPCC) dashboard” https://scartozzi.eu/ipcc_ar6_climate_security_dashboard/

^{vi} Silke Beck, “Moving beyond the Linear Model of Expertise? IPCC and the Test of Adaptation,” *Regional Environmental Change* 11, no. 2 (June 2011): 297–306.

^{vii} IPCC, “Homepage— Intergovernmental Panel on Climate Change,” accessed May 1, 2022, <https://www.ipcc.ch/>.

^{viii} Silke Beck and Martin Mahony, “The IPCC and the Politics of Anticipation,” *Nature Climate Change* 7, no. 5 (May 2017): 311–13; Silke Beck and Martin Mahony, “The Politics of Anticipation: The IPCC and the Negative Emissions Technologies Experience,” *Global Sustainability* 1 (2018); Silke Beck and Martin Mahony, “The IPCC and the New Map of Science and Politics,” *WIREs Climate Change* 9, no. 6 (November 2018).

^{ix} James S. Risbey and Milind Kandlikar, “Expressions of Likelihood and Confidence in the IPCC Uncertainty Assessment Process,” *Climatic Change* 85, no. 1–2 (October 4, 2007): 19–31, <https://doi.org/10.1007/s10584-007-9315-7>.

^x IPCC, “Guidance Note for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties,” 2010, https://www.ipcc.ch/site/assets/uploads/2017/08/AR5_Uncertainty_Guidance_Note.pdf.

^{xi} This table is a re-elaboration of the table available in: IPCC. “Guidance Note for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties,” 2010. https://www.ipcc.ch/site/assets/uploads/2017/08/AR5_Uncertainty_Guidance_Note.pdf.

^{xii} Jason S. Kessler, “Scattertext: A Browser-Based Tool for Visualizing How Corpora Differ,”

ACL System Demonstrations, 2017, <https://doi.org/10.1101/1703.00565>; Gephi Consortium, *Gephi*, version 0.9.3 (Paris, 2017), <https://github.com/gephi/gephi>.

^{xiii} Volker Boege, “The Latest IPCC Report: No Good News for Pacific Islands Countries,” Toda Peace Institute, accessed April 7, 2022, <https://toda.org/global-outlook/the-latest-ipcc-report-no-good-news-for-pacific-islands-countries.html>; Tobias Ide, “What Do We Know About Climate Change, Peace and Conflict?,” Toda Peace Institute, accessed April 7, 2022, <https://toda.org/global-outlook/what-do-we-know-about-climate-change-peace-and-conflict.html>.

^{xiv} Beck and Mahony, “The IPCC and the Politics of Anticipation”; Beck and Mahony, “The Politics of Anticipation: The IPCC and the Negative Emissions Technologies Experience”; Beck and Mahony, “The IPCC and the New Map of Science and Politics.”

^{xv} Gleditsch and Nordås, “IPCC and the Climate-Conflict Nexus”; Gleditsch and Nordås, “Conflicting Messages? The IPCC on Conflict and Human Security.”

^{xvi} IPCC. *AR5 Climate Change 2014: Impacts, Adaptation, and Vulnerability*. New York: Cambridge University Press, 2014.

^{xvii} IPCC. *AR6 Climate Change 2022: Impacts, Adaptation, and Vulnerability*. New York: Cambridge University Press, 2022.

^{xviii} Beck and Mahony, “The IPCC and the Politics of Anticipation”; Beck and Mahony, “The Politics of Anticipation: The IPCC and the Negative Emissions Technologies Experience”; Beck and Mahony, “The IPCC and the New Map of Science and Politics.”