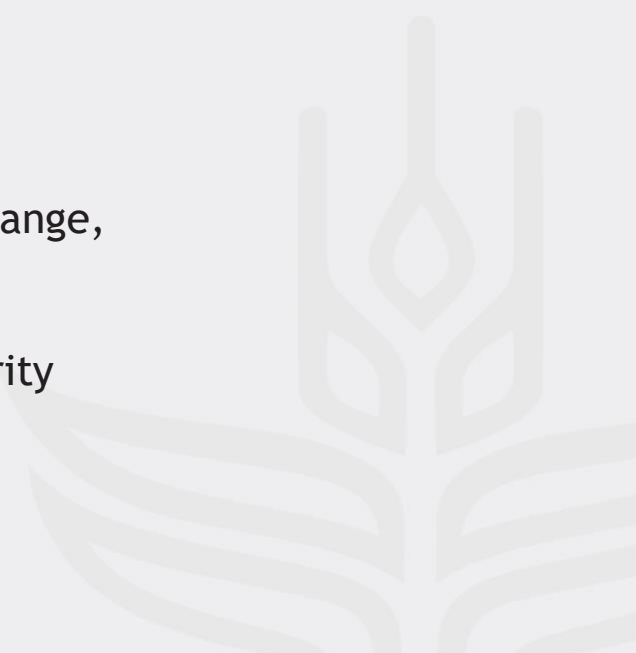Working Paper

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# Development and Impact Monitoring of a Communication Strategy for the CGIAR Climate Security Program

Working Paper No. 320

CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)

CGIAR Focus Initiative on Climate Security

Isabel McLaughlin
Peter McKeown
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* Author for correspondence

## Correct citation:

Titles in this Working Paper series aim to disseminate interim climate change, agriculture and food security research and practices and stimulate feedback from the scientific community.

## Abstract

In this study we investigate the different aspects of a communications strategy to determine factors critical to success and to identify any adaptations and adjustments necessary for improvement. It is vital that research endeavours have the appropriate tools to convey messages of scientific significance to both policy makers, research implementers and the public for the findings to be of value. This paper analyses the data from a communication strategy formulated for CGIAR Climate Security, a new initiative by CGIAR to highlight the extensive pathways by which outcomes of climate change can exacerbate conflict in vulnerable regions. The communications strategy focuses on four main aspects – a Climate Security website, Climate Security webinars streamed from Whova, YouTube and through the UN Global Dispatch Podcast, blog posts and a social media campaign spread across three platforms, Twitter, Facebook and LinkedIn. The strategy was developed and executed over a two month period, where results from Twitter Analytics and Google Analytics were analysed along with the engagement generated from all other platforms. Analysis of Twitter Analytics was focused on aspects of tweets which drove URL clicks and visitors to the Climate Security website. The most effective tweets for generating URL clicks were most commonly accompanied by a video, posted later in the day (afternoon and evening) and later in the week (Thursday to Sunday). The data from Google Analytics suggest that high levels of activity on the Climate Security website produced levels of high engagement. When events such as the Climate Security webinars were scheduled and promoted through social media a pattern of high engagement was observed, compared to times of low activity and promotion. It can be argued that the communications strategy was a success with the Climate Security website generating 62,894 visits from 2,294 different users over the two-month period. Twitter posts generated a total of 152,796 impressions on users. The Climate Security webinars had a combined audience of 16,496 views across all streaming platforms. For sustainable communications impact monitoring it would be necessary to conduct  similar follow-on studies in the future to analyse the impact of changes made to the communication strategy developed for the CGIAR Climate Security initiative.

**Keywords**

Climate Security; communications strategy; engagement; URL clicks; webinars; Twitter; Google Analytics.

## About the Authors

Isabel McLaughlin
MScCCAFS Program Student
Ryan Institute
National University of Ireland Galway
University Rd
H91 TK33
IRELAND
Email: isabelgmclaughlin@gmail.com

Dr. Peter Mc Keown
MScCCAFS Program Coordinator.
Ryan Institute
National University of Ireland Galway,
University Rd
H91 TK33
IRELAND
Email: peter.mckeown@nuigalway.ie

Prof. Charles Spillane
Director of Ryan Institute & Director of MScCCAFS Program,
Ryan Institute
National University of Ireland Galway,
University Rd
H91 TK33
IRELAND
Email: charles.spillane@nuigalway.ie

Dr. Peter Läderach
Lead CGIAR Climate Security
Flagship Leader Climate Smart Practices and Technologies
Rome
ITALY
Email: p.laderach@cgiar.org

## Acknowledgements

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## Introduction

The goal of this study is to investigate the success or lack thereof, of the communications strategy established for CGIAR Climate Security. The overall goal of the communication strategy was to generate an audience and to inform this audience of the necessity of Climate Security to be included in the broader discussion around climate and security. We hoped to achieve this by driving traffic to the Climate Security website.

This study is of significance to the scientific community, as now more than ever, it is vital that scientists have the tools to communicate matters of importance to the general public. This study aims to acknowledge the successes and shortfalls of a communications strategy in order to determine if said strategy is effective. Researchers need to understand how to address the oversights and flaws of communications in order to make improvements and ensure their work can be appreciated by the desired audience.

The purpose of this research is to allow new programs such as the Climate Security initiative, the opportunity to grow their influence and to reach the largest possible audience. To present a guide of the information gap between our research and current communication methods. We hope to present our findings in a concise way to highlight what underpins a successful communications strategy and what should be avoided, providing an opportunity for successful communications of similar scientific endeavours.

We hope to achieve the above by testing the success of the communications strategy for Climate Security based on the analysis of the overall reach of the Climate Security initiative. The main goal of our communication strategy was to drive users to the Climate Security website through two main channels. The first was the production of three Climate Security Webinars which would be hosted on the site. The second was the promotion of the site though social media channels Twitter, LinkedIn and Facebook. To test the effectiveness of the communications strategy we implemented it over a two month period and gathered statistical data throughout. To decipher if the strategy was successful in terms of driving traffic to the Climate Security website we analysed data gathered from Google Analytics, Twitter Analytics and the overall reach of the Webinars.

### Background on Climate Security

It is well documented that climate change will accentuate stresses in many of the world's vulnerable systems such as agriculture, energy systems, water resources, human health, the economy and undermine the general living conditions in which we currently exist (Scheffran and Battaglini, 2010). It is thought that security risks and violent conflict may well be a stress factor arising due to the overbearing pressure on the systems we currently depend on to sustain human life (IPCC, 2007). According to a study conducted by the CNA Corporation, climate change has the ability to lead to increased border tensions around the world, influence large-scale migrations, induce conflict over water and food shortages and the

acceleration and mass spread of disease, all of which have the capability to catalyse instability and conflict in even the most stable regions of the world (CNA Corporation 2007).

The links between climate change and security have found their way into international contemporary politics, with climate change being defined as an impending security threat (McDonald, 2013). The security threats posed by climate change have been identified and explored by many of the world's leading organizations such as the United Nations Security Council (UNSC), the UN General Assembly (UNGA, 2009), the UN Environment Programme (UNEP, 2007) the UN Development Program (UNDP, 2007) and the UN Secretary General (Moon, 2007). Along with these extensive reports, there has been a substantial increase of peer-reviewed literature on the complications climate changes poses to global security.

CGIAR Climate Security aims to address the impending security threats of climate change by showcasing the intricate feedback loops across political and socio-economic systems and the ways in which conflict dynamics can be influenced by climate-related factors in multiple ways. CGIAR Climate Security aims to highlight the interconnected drivers and pathways between climate and security by combining research on natural resource management, agricultural productivity, livelihoods and food security, climate science, youth and gender, value chains and markets to underpin the complex nexus of climate and security. CGIAR's work aims to integrate discourse of security into climate science through research, the development of open source data platforms, the elevation of partnerships to stimulate the exchange of vital resources and information, and the design of programs and interventions for peace building (Climate Security, 2020).

**The importance of research communications**

The ability to translate science and research into effective and actionable policy making, is paramount if we are to face future challenges posed by a changing climate. The struggle between researchers and scientists to communicate findings in ways that resonate with decision makers and the public has been well documented (Cvitanovic and Hobday, 2018). To make progress, both scientists and policy makers must pool their efforts and allow for ever evolving scientific knowledge to transpire into palpable constructive outcomes. For this to be possible, scientists must possess the ability to project tangible possible impacts that may arise from their research. Despite efforts from both parties thus far, there is still a disparity between scientific endeavours and policy making (Cvitanovic and Hobday, 2018).

Aside from communicating with policymakers it is essential that scientists and researchers alike learn to effectively communicate with the media. In a democracy public support is crucial for the success and implementation of sufficient and effective policies (Stoknes, 2014). To secure this support, the public must have access to coherent and convenient information (Junsheng et al., 2019). As the media is the most powerful communications tool at our disposal it is reasonable to state that mass media has the ability to shape understanding and drive awareness of issues surrounding climate change (Neelima and Reddy, 2014).

# Methodology

## Communications Strategy

### Mission Statement

*"The CGIAR Climate Security Research Area aims to conduct research on natural resource management, agriculture and food systems to build resilience in climate-sensitive regions that are prone to or emerging out of conflict. We aim to provide actionable scientific recommendations to organizations in order to design more holistic peacebuilding operations."*

### Background and Rationale

CGIAR is a global agricultural innovation network which includes 15 research centres, eight programs on agri-food systems and four cross-cutting integrating programs across the globe. CGIAR centres and programs contribute to global challenges around food systems and focuses on climate change, natural resources and rural-urban linkages, directly addressing climate change and conflict in the context of the humanitarian, development and peace nexus. CGIAR brings together agricultural, climate, environmental and social sciences to identify and address the most important interactions, synergies and trade-offs between climate change and agriculture. The work of CGIAR makes agri-food systems environmentally and socially sustainable by addressing the regeneration of degraded landscapes, land and water solutions, migration, rural-urban linkages and gender, youth and inclusivity.

Conflicts are often driven by multidimensional interactions between environmental, economic, social and institutional factors. Climate change is increasingly recognised to exacerbate the risk of conflict development, via cascading and interacting effects across socioeconomic and political systems. Climate-related factors impact conflict dynamics in multiple ways, hence the concept of climate security i.e. climate change-induced security risks for human and natural systems, needs to be considered in conflict management and strategic policymaking processes. Until recently, issues around conflict and fragility have been addressed from a symptomatic rather than holistic perspective. The need to integrate climate change and food systems thinking into conflict management is only now being acknowledged by academia, development and governmental agencies. Understanding and systematically analysing the root causes and the role climate security plays for conflict and peace is key to plan and implement interventions addressing and preventing conflict.

### Research Agenda

The long-term goals of CGIAR Climate Security are:

1. To understand the contribution of CGIAR to the prospects to peace.
2. To develop a database and tools for information sharing between researchers and partners alike, while aligning incentives for a common goal.
3. To highlight the impact pathways between climate change and conflict through scientific research and data analysis.

4. To showcase the impact and contribution of CGIAR to the mitigation of these impact pathways.
5. To understand and communicate the intricacies of natural resource management, agriculture and food systems in relation to climate and conflict.
6. Use scientific understandings and relationships with organizations to help build resilience in areas vulnerable to climate induced conflict.

*Each material of communication should be consistent with our mission, goals and message.*

Our communications should encompass the values of CGIAR while promoting information sharing around Climate Security for the common good. Our communications will focus on four main aspects: A Climate Security website, a series of Climate Security webinars, blogs posts and social media.

**Objectives for website:**                                                         **Launch Date: 30/04/2020**

The CGIAR Climate Security website will operate as the epicentre of the Climate Security research area and serve as the face of our brand. The website is critical to the communications and branding of Climate security and will act as a springboard to share knowledge, generate support and raise awareness of our cause. The site should welcome visitors with clear and concise usability while presenting vital information and data for scholars and researchers alike. It will present and aim to educate our audience on our mission statement, provide a space for knowledge sharing and host events and blogs orchestrated by Climate Security and its partners. The website will be designed with the following guidelines in mind:

**Landing Page –** The home page of the CGIAR Climate Security website will give users a background on the objectives and goals of CGIAR Climate Security. It should educate users of the need for intellectual discourse concerning climate, security and the intense and complex pathways which connect them. The page should showcase issues which CGIAR hopes to address and how we plan to address them – through research and education, knowledge sharing, the development of information databases, strengthening of partnerships and institutional reform towards processes for peace by aligning common objectives and incentives.

**Contributions to Peace –** Here users will encounter the extensive portfolio analysis of research papers which identify drivers of conflict both directly and indirectly through a searchable database on CGIAR's contribution to peace. An interactive visualization of driver interactions will be showcased to give users an opportunity to explore the complex interactions and feedback loops which drive climate induced conflict. Users will have the freedom to search different drivers of conflict with results showing visitors the consequences of said driver in regions of the world. The page will also serve as a platform to an extensive information database of all reviewed literature which contributed to the findings and implementation of the interactive Climate Security explorer.

**News and Events –** The news and events section of the website should be used to update users on the progress and initiatives being undertaken by CGIAR and partners in the process for peace. News will be published intermittently in the form of blogs which are discussed

below in more detail. All events orchestrated by CGIAR Climate Security will be announced via this page. Initially, users will find details of the six webinars from the Climate Security Webinar Series.

**Objectives for webinars:**                                        **Launch Date: 04/06/2020**

The Climate Security Webinar series will aim to provide an immersive knowledge sharing experience for guests. We hope to broadcast the webinars to an expansive audience while conveying the key messages of Climate Security though hosted panel discussions between subject experts. They will incorporate topics which focus on issues related to and affected by climate security with an emphasis on the impact pathways between climate change and conflict. The webinars will help to solidify the importance of climate security and the role of CGIAR within it, through the reinforcement of knowledge and data sharing through expert discussions.

*Webinar 1:* The role of climate and food systems science in conflict prevention and peacebuilding.
*Webinar 2:* The importance of data and disruptive technologies for climate security.
*Webinar 3:* Sustainable finance for peace.
Webinar 4: Climate security in the Sahel.
Webinar 5: Climate security in post-conflict Colombia.
*Webinar 6:* A partnership agenda for Climate Security.

All webinars will be hosted on Whova and streamed live on YouTube. Whova is an event management application used to organize events with a modern interface. Whova can be used to market the event while managing logistics for the event organizer. It specializes in user engagement and attendee networking by encouraging users to interact via polls, questionnaires and chat rooms (What Is Whova? | Whova FAQ, 2020).

The webinars will be hosted by Mark Goldberg. Mark is the creator and broadcaster of the UN Global Dispatch podcast which has approximately 5,000 active weekly listeners. The webinar will be produced and distributed as podcasts by Mark and the UN Global Dispatch.

**Objectives for blogs:**                                           **Launch Date: 15/08/2020**

Individual blogs will focus on specific case studies which are relevant to the field of Climate Security. Focused on regions and situations that may benefit from climate security initiatives and projects established by CGIAR and partner organisations to reduce conflict vulnerability. Although each blog post will focus on its own topic, the core message should be consistent and focus on highlighting the impact pathways between climate and conflict while underlining the impact and contribution of CGIAR and its partners to the mitigation of said pathways.

*Partner Organizations:* These blog posts should incorporate updates on specific initiatives which focus on our work with partnering organizations and the parallel between our missions. Highlighting projects which aspire to achieve security in vulnerable areas through the adaptation of systems and processes. Projects and organizations with common end goals to

the Climate Security research area are suitable here. This will help to strengthen partner relations and build relationships.

*Country Profiles* – The second subset of blog posts will focus on independent country profiles. Each country should be given background information focusing on specific vulnerabilities relating to climate and conflict in that region. An in-depth investigation of the different impact pathways specific to that country, and finally, the ways in which the work of CGIAR and partners is addressing these impact pathways, including the benefits, programs and projects in the area.

**Social media channels:**

As a new facet of CGIAR, Climate Security will not create its own social media channels. It will instead make use of the social media channels already in operation by CGIAR and its research programs. We have been granted access to the accounts of CGIAR, CCAFS and CIAT for Twitter, LinkedIn and Facebook. These accounts have a combined total following of 413,300. The decision not to create our own social media channels stems from research that shows social media accounts take an extensive amount of time and resources to establish and build a loyal following. It is paramount to avoid creating a social media 'ghost town' which can actually have a negative impact on your brand or organization (Sweeney and Craig, 2011).

We will develop a series of social media toolkits for Twitter, LinkedIn and Facebook. These toolkits will comprise a series of posts for each social media site, accompanying media (video/image) for each post and a suggested date of posting. These will be sent to our partners at CGIAR, CCAFS and CIAT for redistribution through their highly established social media channels.

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**Twitter Communications**

Twitter, a microblogging social media site, launched in 2006, has 330 million active monthly users as of July 2020. Designed to allow users to follow one another and post short status updates of a maximum of 220 characters. Twitter has an ever updating timeline with content ranging from politics, breaking news, science, technology, business and more (Marwick and Boyd, 2010). Twitter is increasingly being used within the scientific community to share scientific journals, increase readership, knowledge and to "create a platform for dynamic scientific discussion" (Wadhwa et al., 2017).

The success of a Tweet can be measured by the amount of impressions and engagements it gets. Impressions refer to how many times the Tweet has been seen. This includes not only the times it appears on a followers timeline but also as a result of a retweet, like or is shown through the search function. Engagements are the total number of interactions a tweet accumulates. This accounts for clicks anywhere on the tweet including retweets (a re-share from a third party account), likes, replies, follows, link clicks, hashtag clicks, media interaction or detail expansion (Wadhwa et al., 2017).

The analysis for this study is based on three datasets. Each dataset is a subset of tweets posted by a Twitter account belonging to CGIAR, CCAFS and CIAT. The CGIAR Twitter account has

110.6 thousand followers - 28 tweets were posted from this account. The CCAFS Twitter account has 64.5 thousand followers, 21 tweets were posted by this account. Finally, the CIAT Twitter account has 45.5 thousand followers with 15 tweets being published from this account during the course of this study. As the ultimate aim of the campaign was to drive users to the Climate Security Website, the analysis in this paper is focused on what drives URL clicks.

Each tweet is made up of different characteristics such as the text of the tweet, hashtags, accompanying media and user profile tags. These along with the time of day and day of the week the tweet was posted can be analysed to determine what makes up a successful tweet. The objective of the Climate Security Twitter campaign was to ultimately drive users to the Climate Security website. For this study we analysed the type of media used, time of posting and day of the week. Using these variables we determined which characteristics of a tweet were likely to drive impressions, engagements and URL clicks.

To understand which type of media is the most effective at generating engagements and URL clicks for the three twitter accounts we calculated the average number of engagements and the average number of URL clicks per tweet for each media type across the three Twitter accounts. There were two types of media used in the twitter campaign: images and videos. We can compare the effectiveness of each media type by comparing average engagements and average URL clicks for the set of tweets which were accompanied by video media and those accompanied by an image.

In this study tweets were posted on every day of the week, with slightly more tweets being posted at the beginning of the week than the end. To calculate which day of the week is the most effective for posting tweets that garner engagement and URL clicks, we first found the average of both variables for each day of the week across the three twitter accounts. Once we had the average engagement and URL clicks for each day of the week for the separate Twitter accounts we combined these averages to determine the best average day/days of the week for posting in general for the three accounts.

For the purpose of this study, the time of day was broken down into Morning, Lunch, Afternoon, Evening and Night. Tweets were posted throughout the day at different times across all twitter accounts. The CGIAR, CCAFS and CIAT Twitter accounts are based out of Europe, so the Central European Standard time zone was used to sort the tweets into the five categories mentioned above. To calculate the most effective time of day to post tweets in terms of engagement and URL clicks we grouped the tweets into clusters. Morning tweets were tweets posted between 06:00am & 11:59am. Lunch time tweets were sent out at 12.00pm through 12:59pm. Afternoon tweets accounted for all tweets posted from 13:00pm until 17:59pm. Tweets in the evening category were posted from 18:00pm to 21:59pm and finally tweets in the night category were posted between 22:00pm and 05:59am. We then calculated the average engagement and URL clicks for the tweets according to the time of day. We did this across the three Twitter accounts independently followed by an overall average across the three twitter accounts.

**Google Analytics**

The second section of our data analysis was sourced from Google Analytics. Google Analytics is a tracking application which can be used in conjunction with a website by inserting a piece of HTML coding into each page of a website. This code records data which can provide invaluable insight into how users are interacting with a website. The detailed statistics generated by Google Analytics can compare how users transact with different aspects of the site such as, page visits, interactions and clicks, thus giving invaluable understanding into aspects of the site that are popular among users and aspects that may need to be improved (Plaza, 2011).

The results below aim to show actions which may have a positive impact on acceleration in traffic to the Climate Security webpage. Further than this we can investigate how deep users navigate into the site, if their traffic source has an impact on their interaction with the site, and if so, which traffic source is the most effective? We also get a glimpse of the geographical data of users. This data can provide awareness about the possible need for modifications to the site depending on popular user countries and language barriers. Comparing the behaviour of users on different features of the site can provide enlightenment on how to improve the design and content of the site in line with user's needs (Plaza, 2011).

The Climate Security Webpage was launched on 29/04/2020, using the data from Google Analytics we were first able to visualize the daily active users of the website from its launch date until 24/06/2020. This gave us an opportunity to compare times the site was busy with the timings of social media campaigns and events to understand how promotion, or lack thereof effected daily users of the website.

The data gathered from Google Analytics can also give an insight into the effectiveness of third party referral sites that are generating traffic to your website. In the case of this study a referral site makes reference to any page visit which is not an organic search for the website through a search engine. In other words if a user lands on the Climate Security website through following a link from a third party site, this site is classified as a referral site. This information is useful for understanding the means in which users are navigating to the site and which types of promotion are most effective. In this instance the website was navigated to though Twitter, Facebook, LinkedIn, search engine, email and a small percentage of various sites which are classed as 'other'.

It is also possible to analyse the 'bounce rate' of each visit. The bounce rate of a website refers to the total number of single page sessions divided by the total number of page visits whereby the user views only a single page on the website and does not explore further (Bounce rate - Analytics Help, 2020). A high bounce rate can indicate low engagement with the site and a 'poor experience following the click' (Sculley, et al. 2009). Google Analytics gives us the opportunity to see the bounce rate of users in relation to the means in which they navigated to the site. This can indicate which navigation route is most likely to traffic users who are engaged with the content of the site.

Using the data gathered by Google Analytics we can see the language that a user's computer is searching in. This gives us an insight into popular first languages among our users. In conjunction with the data on language, the geographical data from Google Analytics can be used to determine where users are coming from around the world. By analysing the search language data against the geographical data of users we can determine if the site would benefit from high quality translation to improve the usability for users whose native tongue is not English.

## Results

**The impact of impressions and engagement on URL clicks.**

*Fig.1*, shows that there is a positive correlation between high tweet impressions and engagement across the three Twitter accounts. Retweets and likes are two other factors which positively drive URL clicks. The higher the number of retweets and likes, the higher the average number of URL clicks per tweet. More precisely: (1) High impressions are positively correlated with high engagement, and (2) High impressions are slightly correlated with likes and URL clicks.
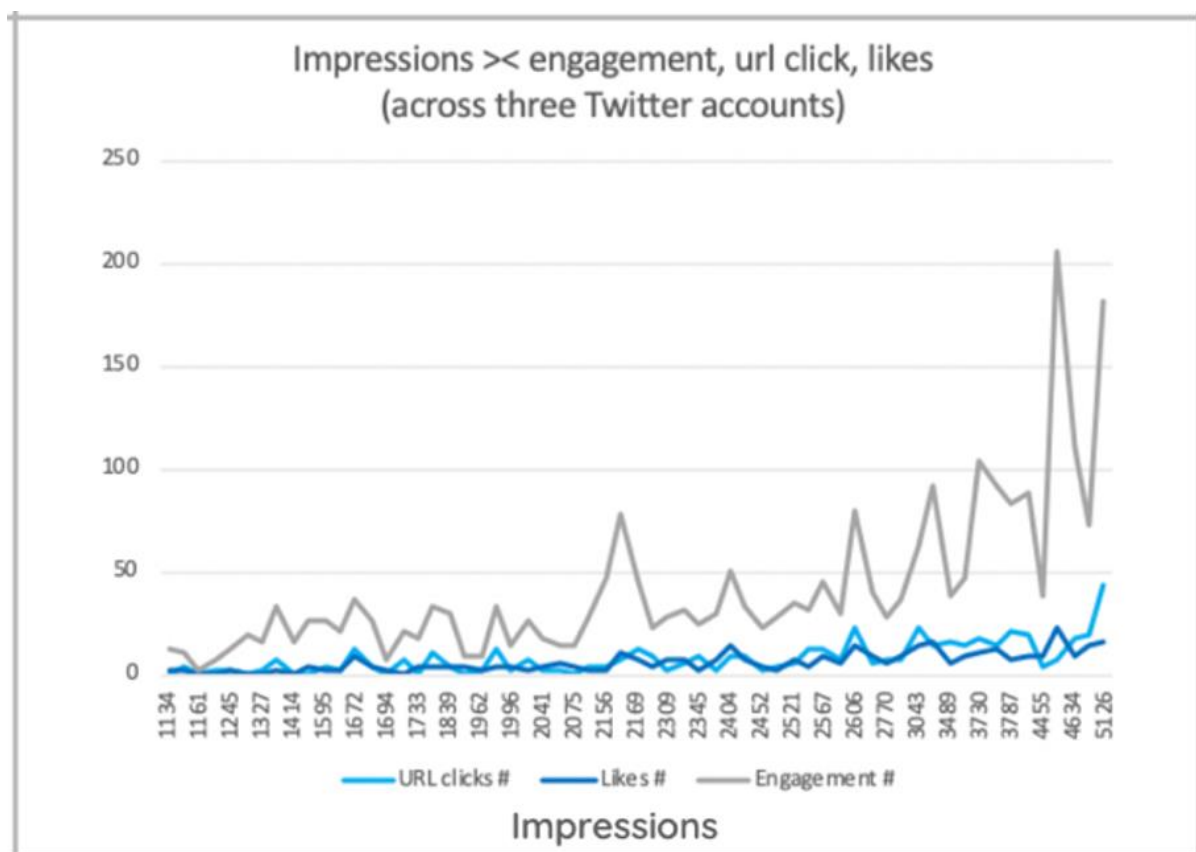


Fig 1. Impact of impressions on URL clicks, likes and replies.

High engagement is also associated with a higher number of URL clicks per tweet. As can be seen on the graph *Fig 2*, there is a positive correlation between high engagement and high URL clicks per tweet across the three Twitter accounts.
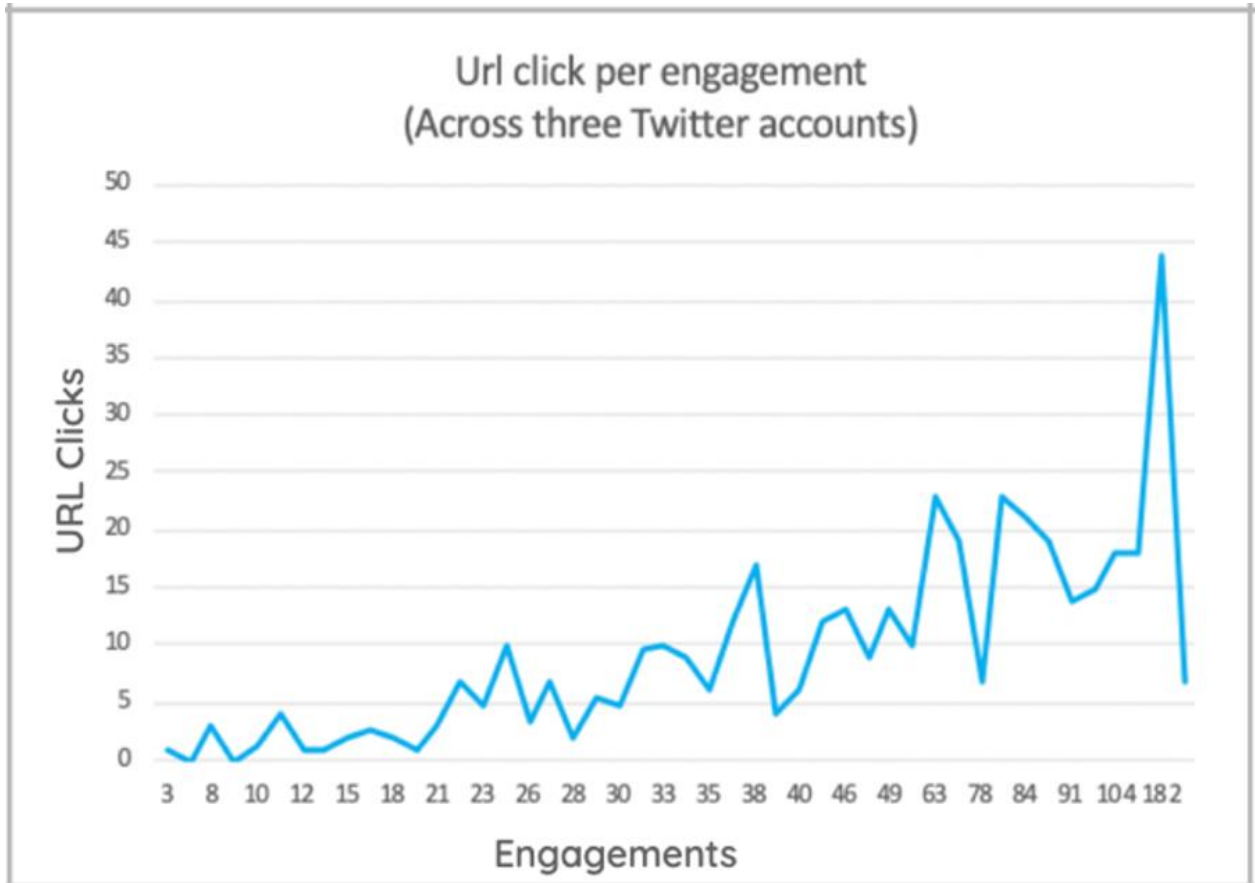
Fig 2. No. of engagements to URL clicks.

**The influence of media type on engagement and URL clicks.**

The relationship between the type of media and the engagement/URL clicks was different across the three Twitter accounts. More precisely as we see in *fig 3.* for both CCAFS and CIAT, tweets with videos had a slightly higher average number of URL clicks and engagement. For CGIAR tweets with images drove average engagement per tweet, but did not have a significant impact on the average URL clicks.

*Fig 3.* Comparison of media type on engagements and URL clicks.

**How the day of the week affects URL clicks**

For CGIAR the tweets that were posted at the end of the week had higher average URL clicks. Tweets posted on Thursdays had on average 7 URL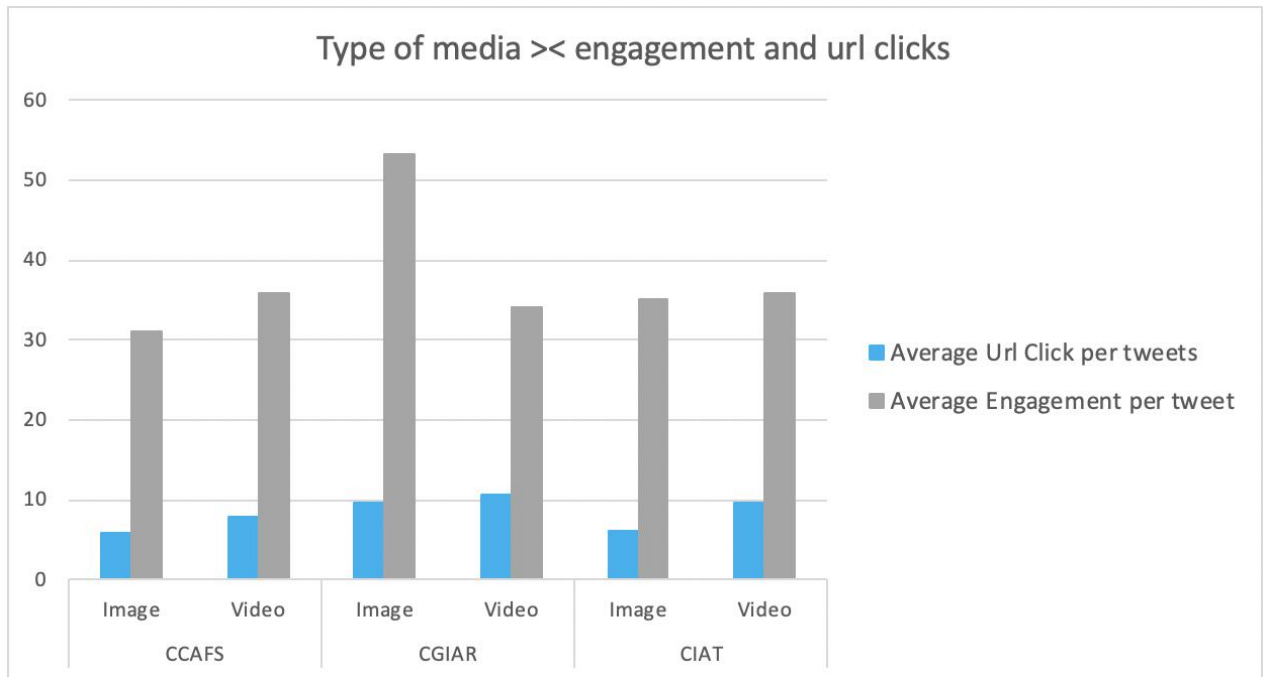 clicks, while tweets posted on Fridays, Saturdays, and Sundays had on average 12, 19, and 44 URL clicks respectively. For CCAFS tweets posted at the end of the week had on average more URL clicks (except for Tuesdays, which may be linked to one specific tweet driving average URL clicks). Tweets posted on Mondays had on average 2 URL clicks per tweet, while tweets posted on Fridays had on average 9.5 URL clicks per tweet. Tweets posted by CIAT on Fridays had significantly higher average URL clicks. Tweets posted on Mondays had an average of 0.5 URL clicks, while tweets posted on Fridays had on average 17.5 URL clicks.
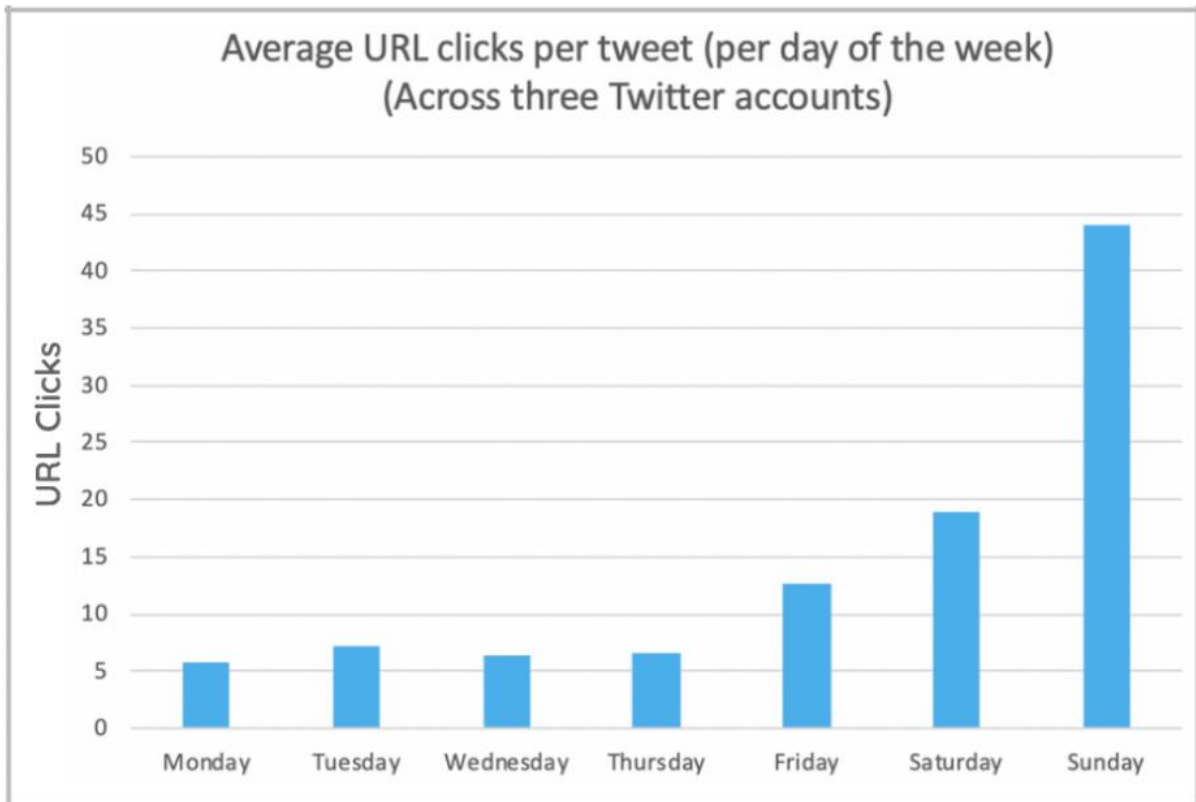
*Fig 4.* URL clicks by day of the week.

**How the time of posting impacts URL Clicks and engagement**

The impact of the time of the day is less clear and is different for the three Twitter accounts. The tweets sent from CGIAR posted in the morning and in the evening have higher URL clicks per tweet on average. Tweets posted during lunch time were not efficient in terms of engagement or URL clicks. Here, morning and evening tweets did the best in terms of URL clicks. However, it is important to note that afternoon and night tweets were also efficient.

For CCAFS lunch, evening and night tweets were very efficient in terms of URL clicks and engagement. On average afternoon and morning tweets did not perform well in terms of overall engagement. Here again, it seems that the later the tweet was posted, the better it did. Tweets posted in the morning have the lowest average URL clicks per post (only 4 URL clicks per tweet). Lunchtime and evening are the two best times to post tweets that will drive URL clicks.

Posts from the CIAT account performed better in the afternoon than morning tweets with an average of 9 URL clicks and 5 URL clicks per post respectively. There was only one tweet sent out in the evening which performed very well suggesting that tweets should be posted later in the day (mid-afternoon - evening). The data for time from the CIAT account is a bit disaggregated as there was not enough variation in the available data to display accurate results.
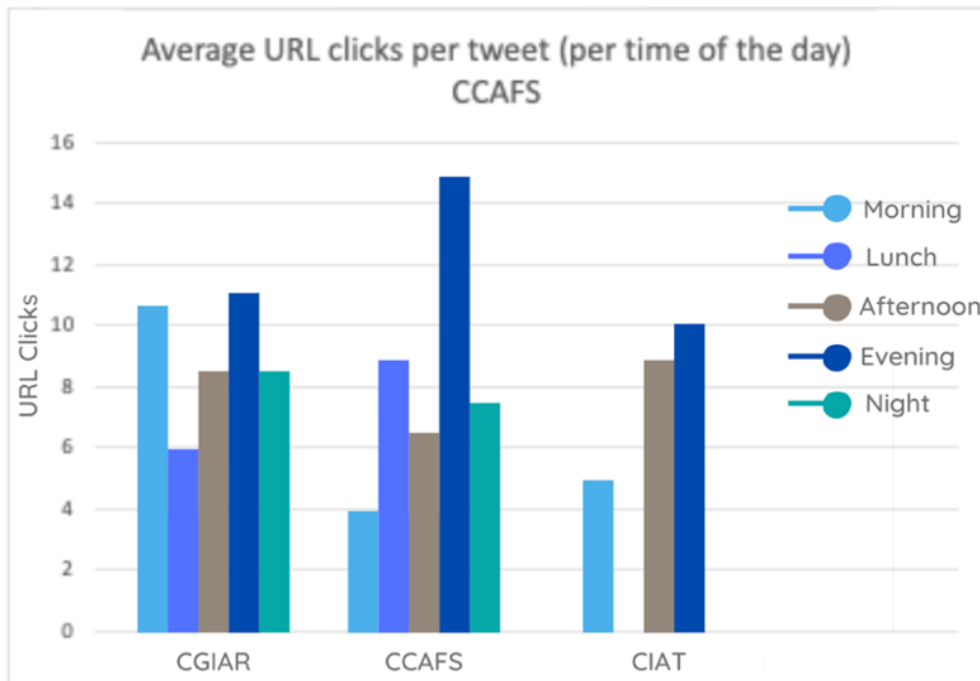
Fig. 5 Av. URL clicks per time of day across three twitter accounts.


**Daily active users of the Climate Security website**

Using the data from Google Analytics *fig 6.* shows us that the Climate Security Webpage had a slow start due to limited promotion which began to pick up May 22 – the day the promotion for Webinar 1 'The role of Climate and Food Systems Science in Conflict Prevention and Peace Building' was launched. This climb continues until 04/06/2020 where it reaches a peak of 1064 active daily users. This is the day Webinar 1 was launched on the website. From 05/05/2020 the site experiences a slight lull before promotion for webinar 2 'The importance of data and disruptive technologies for climate security' began.

We again see a steady rise up to 18/06/2020 where daily active users reach its peak at 1,551. Following the same pattern on 19/06/2020 post webinar the active daily users begins to fall – right up until 02/07/2020, the day of webinar 3 'Sustainable Finance for Peace' where it experiences a slight daily increase to 1,156. Post Webinar 3 we see a steady decline in daily active users where at the time of writing was 597.
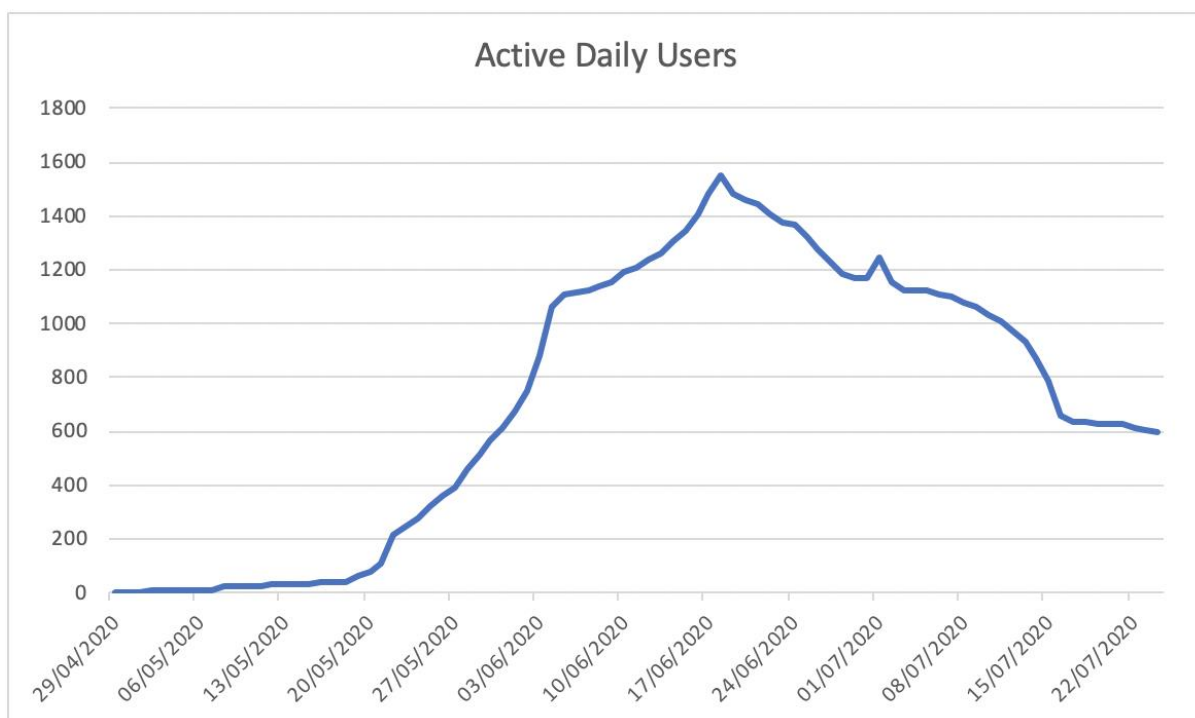
Fig 6. Active daily users over a three month period.

**Bounce rate of Climate Security website users**

The site was visited by a total of 2,294 users between 29/04/2020 and 24/07/2020. Of those visits 1,350 users navigated to the site through a bookmark or direct URL search. There were 944 remaining visits from various sources (email promotion, independent sites etc.). Bookmarked URLs or a direct search through a search engine showed a lower bounce rate than other sources.

The remaining 944 visits can be analysed against the number of prompts generated from each communications channel used to promote the website to estimate the effectiveness of each channel against bounce rate. We can see from *fig 7.* users who navigated to the site through Twitter had the lowest bounce rate meaning traffic navigating from Twitter is less likely to leave the site after just one page. Users navigating from 'other' means such as independent sites had the highest bounce rate.

| Source/Medium | Users | Bounce Rate |
|---|---|---|
| Direct / Bookmark | 1350 | 40.70% |
| Total Other | 944 | 46.20% |
| Total Page Visits | 2294 | 43.45% |

Table 1. Total Page Visits by Total Bounce Rate. Source of site visits and respective bounce rate.
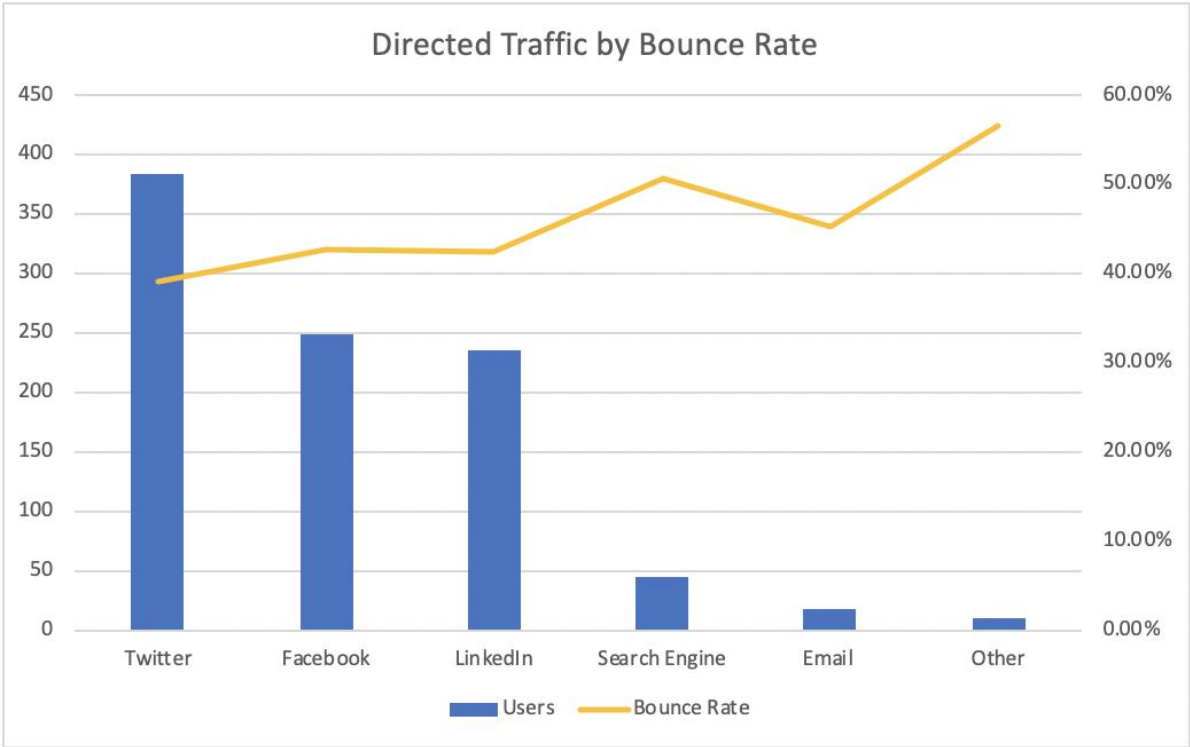
Fig 7. Directed traffic to site vs. bounce rate for each perspective site.

**Site visits generated per promotional social media post**

As seen in the table below (*table 2.)*, although Twitter generated the most overall site visits it only generated approximately 6 visits per post averaging out the same as visits from email promotion. We can see Facebook has the highest visits per post at 18. LinkedIn shows it is also an effective tool for producing website traffic averaging out at 14 site visits per post.

| Channel | Posts | No. Users | Av. Visits per Post |
|---|---|---|---|
| Twitter | 65 | 383 | 6 |
| Facebook | 14 | 250 | 18 |
| LinkedIn | 17 | 236 | 14 |
| Email | 3 | 18 | 6 |

Table 2. Average site visits per promotional posts for page visits with navigation data available
.

**Geo-data of website users**

Shown below in *fig 8.* we see that English, at 84%, was the primary language used to search the site followed by Spanish at 6% and French at 4%. Other search languages used were Italian, Dutch and Deutsch all at 2%.
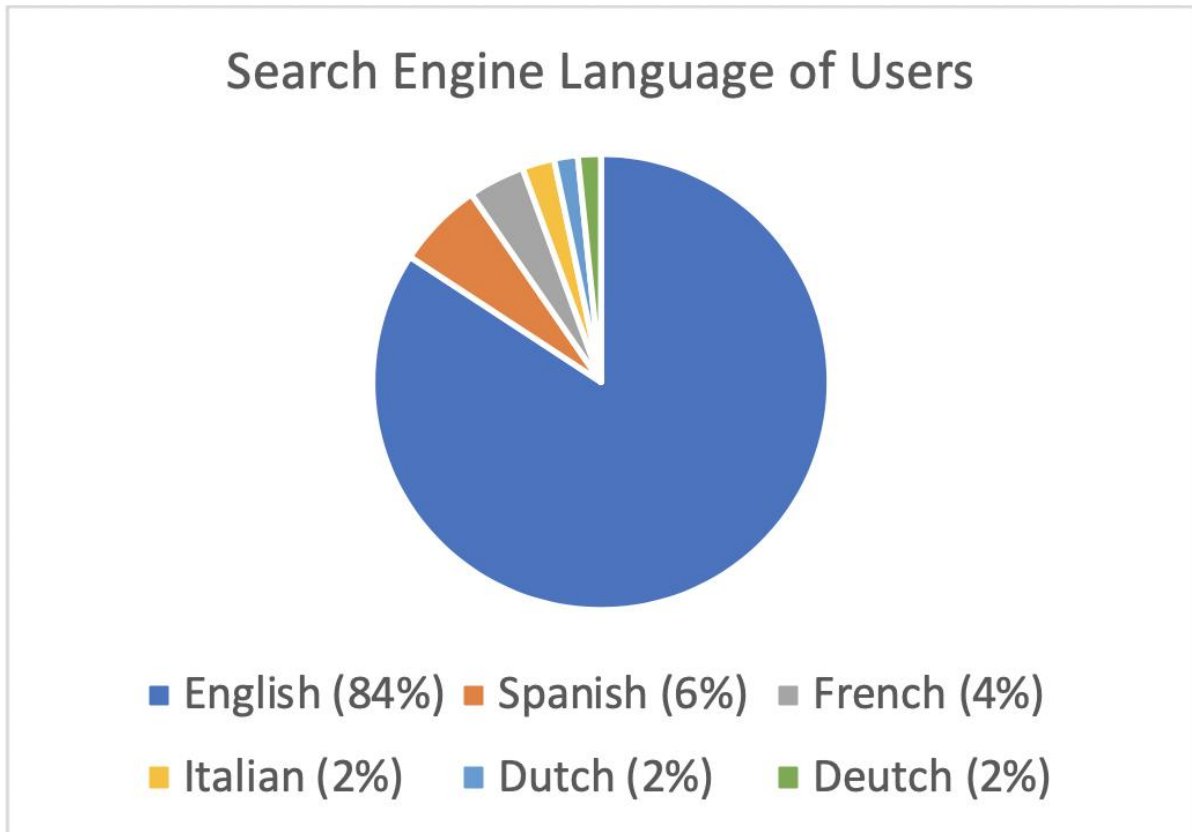


Fig 8. Search engine default language of website users.

The website had quite a large reach with visitors from 127 different countries. India leads with 12.48% of total users, followed by the U.S with 9.82%. The third, fourth and fifth countries with highest visitor rates were The Netherlands (Deutsch), Italy (Italian) and Spain (Spanish) respectively. This correlates with the popular search engine languages except for in India where it may be assumed users searched primarily in English.

| Country | Users | Percent of Total Users |
|---|---|---|
| India | 258 | 12.48% |
| U.S | 203 | 9.82% |
| Netherlands | 120 | 5.81% |
| Italy | 109 | 5.27% |
| Colombia | 97 | 4.69% |
| U.K | 84 | 4.06% |
| Germany | 73 | 3.53% |
| Indonesia | 66 | 3.19% |
| Kenya | 66 | 3.19% |
| Canada | 61 | 2.95% |
| Nigeria | 53 | 2.56% |

*Table 3.* User count by country.

## Discussion

**Impressions, engagements and media type are important for driving URL clicks**

The analysis of the three Twitter data sets show that it is important to focus on tweet engagement and tweet impressions, as these two factors are positively correlated with URL clicks. High impressions are associated with higher engagement and URL clicks. The high correlation between engagement and URL clicks per tweet suggests that if a tweet has high engagement, it will also have a greater number of URL clicks. Replies and media views are not correlated with URL clicks. This means that a higher number of replies will not be associated with higher average URL clicks per tweet. In terms of accompanying media CGIAR performed better when accompanied with an image on engagement but not significantly on URL clicks, in contrast to this, both CCAFS and CIAT performed better with a video accompaniment on both counts. This suggests that videos are more effective at driving URL clicks but the difference is not overwhelmingly significant meaning a combination of both images and videos are suitable with a slight emphasis on video where possible.

**Influence of the day and time of posting on tweet engagement**

In this study the day of the week had a significant impact on how users reacted to the tweets. Tweets that were posted at the end of the week (Friday-Saturday-Sunday) had higher engagement/URL clicks and likes. A reason for this may be linked to the fact that people are less focused on their work at the end of the week and have more time to interact with tweets. Tuesday, Wednesday and Thursday being the most productive days of the work week in terms of work productivity (Bryson and Forth, 2007) leaving people more focused on work and less likely to interact with posts. Across the three twitter accounts, Monday is the day of the week

with the lowest level of engagement per tweet. However, it is important to note that only a small subset of tweets were posted at the end of the week. It would be necessary to test this hypothesis by posting more tweets at the end of the week and review findings a month later.

Once we began analysing the impact of the time of the day on tweets it became clear there was a significant limitation in the study. As CGIAR, CCAFS and CIAT are all international organizations the time of day for their followers vary significantly by time zone, meaning people may be viewing the tweets internationally at all times of the day. This may influence the data gathered from the variable of time. Overall the time of the day seems to be less important to determine whether a tweet will be efficient. For CCAFS and CIAT it seems beneficial to post in the afternoon/evening. For CGIAR it is better to avoid lunch time, but any other time of the day can be efficient. It would be interesting to test this hypothesis in future studies with an equal number of tweets posted throughout the day to gain further insight into how the time a tweet is posted can affect URL clicks and engagement.

From the above findings we can see that it is important to focus on high impressions and high engagement, as both are associated with higher levels of URL clicks per tweet, they have a correlation of 70% and 72% respectively. Retweets also have a high correlation with URL clicks at 71%, likes, media engagements and detail expands also all show moderate correlation to URL clicks while media views and replies show no positive correlation to URL clicks.

**How activity and promotion affect website traffic**

The data gathered from Google Analytics suggests a few practices that may help to increase the traffic and usability of the Climate Security website. We see a positive correlation between the amount of activity, interaction and active daily users to the site. This suggests that in order to generate more traffic, Climate Security should aim to increase content such as posting regular news updates and blogs along with hosting more events such as the Climate Security Webinars. These should all be promoted using social media and other methods with the overall goal of redirecting both interested parties and a new audience to the webpage.

We also see that Facebook and LinkedIn could be more useful in terms of generating website traffic as they had the highest visits per post at 18 and 14 respectively. This research project focused strongly on Twitter as a medium for promotion which may have posed a limitation to the study. One reason for the large differentiation in visits per post between platforms could be that Twitter posts were reaching the same users repeatedly, driving the click rate down per post. This is something to consider for future studies where it would be beneficial to focus on all three sites equally to see how the click rate alternates. Although the click rate is significantly higher for Facebook/LinkedIn we see that the bounce rate for users redirected through Twitter is slightly lower than the aforementioned, indicating that Twitter posts are more targeted toward invested parties.

**Geo-data of users indicates a need for high standard linguistic translations**

Finally the geographical data shows us there may be a need for high quality translations as the search engine language strongly correlates with the geographical location of users. Taking the Netherlands for example as the third highest country for visitors it may benefit Climate

Security to increase the usability for this demographic through linguistic convenience. Linguistic preferences should be considered for sites that address different populations as language can be an important factor for a webpage as it can become a barrier for many and provide an unfriendly user experience. Studies have shown that the original scripted language of a website can have an adverse effect on users with a different native tongue, making them less likely to be satisfied with the overall usability (Nantel and Glaser, 2008) which can lead to a high bounce rate and unreturning visitors both of which are undesirable when trying to grow the following of a website (Kralisch and Koeppen, 2005).

## Conclusions

The need for sound scientific communication methods is crucial for scientists and researchers to effectively communicate results and findings in a concise and relatable way to policy makes, decision makers and the public in order for their efforts to make an impact on progressive action. The research community must understand the importance of effective communications in order to translate findings into tangible, positive outcomes. The importance of media cannot be downplayed in its effectiveness to bridge the knowledge gap between the scientific world and public opinion.

This paper reviewed the capabilities of different social media channels and a website in their contribution toward a successful communications strategy. The research conducted in this paper set out to identify both the successes and failures of a scientific communications strategy. By developing and executing a communications strategy for CGIAR Climate Security we were able to analyse data from different sources such as Google Analytics, Twitter Analytics, Facebook and LinkedIn posts, YouTube and the Whova app where the Climate Security webinars were streamed. The CGIAR Climate Security initiative was also promoted through the UN Global Dispatch Podcast where the three webinars were broadcast.

It can be argued that the communications strategy in this instance was a success and effectively broadcast the CGIAR Climate Security initiative to an entirely new and expansive audience. Within a two month period the Climate Security Website had a grand total of 62,894 visits from 2,294 different users. These visits were largely directed through our social media campaigns across Twitter, Facebook and LinkedIn. The Climate Security webinars played an important role in communicating the message of climate and its links to security with a combined audience of 16,496 views across all streaming platforms for the webinars. The data gathered throughout this study provides an important insight for future scientific communications initiatives in terms of effective methods for the production and distribution of communication materials.

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CGIAR Climate Security aims to address the impending security threats of climate change by showcasing the intricate feedback loops across political and socio-economic systems and the ways in which conflict dynamics can be influenced by climate-related factors in multiple ways. CGIAR Climate Security aims to highlight the interconnected drivers and pathways between climate and security by combining research on natural resource management, agricultural productivity, livelihoods and food security, climate science, youth and gender, value chains and markets to underpin the complex nexus of climate and security.

CGIAR's Climate Security work aims to integrate discourse of security into climate science through research, the development of open source data platforms, the elevation of partnerships to stimulate the exchange of vital resources and information, and the design of programs and interventions for peace building. For more visit us at https://www.climatesecurity.cgiar.org/

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