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# **An Index for Climate-Induced Migration Uncertainty**

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8 December 2023

Online at <https://mpra.ub.uni-muenchen.de/119524/>  
MPRA Paper No. 119524, posted 30 Dec 2023 08:39 UTC

# **An Index for Climate-Induced Migration Uncertainty**

**Sulaiman Salisu<sup>1</sup>, and Afees Salisu<sup>2,3</sup>**

## **Abstract**

Climate change has had a significant impact on the world, and many efforts have been made to mitigate its risks. This study aims to create a new index that measures the uncertainty surrounding migration due to climate change. To do this, the study uses a variety of international newspapers with a global readership. Although climate change has increasingly spurred migration decisions in vulnerable areas, there is still a lack of quantitative research that explores this link. This is the contribution of our study. The evidence from the index shows an upward trend in climate-induced migration decisions, especially in the last two decades, which supports the motivation behind the study. Our index has several practical applications that can be useful for future research agendas.

**Keywords:** News, Climate change, International migration, Uncertainty

**JEL Codes:** D8, D81, F22,

## **Acknowledgements and Disclaimer:**

The authors would like to acknowledge the research assistance from Abee Olaniran, Yinka S. Hammed and Lukman Lasisi. Needless to say, the authors are responsible for any remaining errors in this version of the paper.

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## **An Index for Climate-Induced Migration Uncertainty**

### **1. Introduction**

Climate change is being manifested at an alarming rate globally, and it has constituted a source of concern to world leaders and policymakers – the most recent of which is the 2023 UN Climate Change Conference<sup>4</sup> hosted by the United Arab Emirates (UAE) in Dubai. Meanwhile, climate threats often accompany a growing number of global population changes and temporary displacements. The foregoing is exemplified by a significant number of Somalis who emigrated to Kenya's Dadaab refugee camp between 2011 and 2012 owing to drought and famine in the Horn of Africa. Similarly, statistics have shown that between 2008 and 2016, abrupt weather-related disasters forced an average of 21.5 million people to flee their countries annually, while dangers associated with the effects of climate change displaced thousands more people (UNHCR, 2017). The most common hazards that UNHCR responds to are related to climate change, including floods – 38% earthquakes – 26%, and their engagement has been global covering Asia, Europe, Latin America and Africa. According to the World Bank, by 2050, some regions, including Asia, Latin America and Africa, may jointly generate 143 million internal migrants due to climate change. Consequently, migration has been considered and employed as a useful strategy for mitigating the risks associated with climate change, as it entails the movement of people and households, either temporarily (e.g., seasonal or circular migration) or long-term, as well as involuntary and often temporary displacement as a result of unforeseen circumstances including extreme weather events (see McLeman et al., 2021).

Quite a handful of attempts have been made to quantitatively conceptualize distinctly migration uncertainty (see Fraser and Ungor, 2019; International Organisation for Migration (IOM), 2023) and climate uncertainty (see Faccini, Matin, & Skiadopoulos, 2021; Gavriilidis, 2021)<sup>5</sup>, however, there is no study to the best of our knowledge that measures climate-induced migration uncertainty. Thus, we bridge this gap by constructing a new index establishing the link between climate change and migration. While Fraser and Ungor (2019) construct an index on migration-induced fear (due to security) and its associated socio-economic consequences, the IOM only relates the exposure of the human population to various climate risks<sup>6</sup>. Migration

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<sup>4</sup> This conference comprises the 28th meeting of the Conference of the Parties (COP 28), which seeks to put nature, people, and livelihoods at the heart of climate action, fast-track the energy transition and slashing emissions before 2030, and transforming climate finance by delivering on old promises and setting the framework for a new deal on finance, among others.

<sup>5</sup> See a review of climate risk measures in Salisu and Oloko (2023).

<sup>6</sup> <https://www.migrationdataportal.org/climate-mobility-impacts>

(domestic and international) in reaction to the effects of climate change can take several forms, from forced relocation in the event of imminent danger to mobility as a proactive adaptation strategy. Essentially, forced and abrupt migrations caused by climate change necessitate our construction of a global index to connect climate-related migration studies to more general economic fundamentals in order to promote synergy between academic research and migration-related policymaking.

Thus, we develop a news-based global quantitative indicator showing the intensity of climate-induced migration uncertainty from 1984Q1 to 2023Q3. Taking the lead from Narayan et al. (2021), multiple international newspapers with a global presence and readership are employed, and queries relating to climate, migration and uncertainty are subsequently utilised (see Table 1) to construct our index. This index would come in handy for policy-makers involved in housing and regional planning, as well as fiscal and monetary authorities, among others, in their quest to formulate integration policies necessary to mitigate climate-related migration risks. For example, in the course of the relocation, the housing needs of migrants evolve from needing emergency shelter to eventually relocating permanently to the receiving country and the ensuing integration that follows. Thus, housing and regional planners need to be fully ready to cushion the post-migration trauma orchestrated by climate change, and our index could be a pointer to this preparedness.

In Figure 1, we show the plot from our index. The plot depicts an upward trend in climate-induced migration uncertainty, and the spikes show various climate events associated with the rising forced migration. The highest spike was recorded around 2021, following the wildfires recorded in Greece and Turkey. Similarly, a renewed effort to mitigate climate change has resulted in a slight reduction in uncertainty. Given this introduction, the rest of this paper is structured as follows. While Section 2 revolves around the data collection method, which includes keyword identification and selection of relevant newspapers as well as news text, we present an overview of the index in Section 3. Section 4 offers the likely future research agenda and concludes the paper.

## **2. Data Collection Methodology**

The data collection process for this study comprises three integral steps: keyword identification, the meticulous selection of relevant newspapers, and the systematic download

of news texts. Each step is meticulously designed to ensure the acquisition of pertinent data for a comprehensive analysis.

## 2.1 Keyword Identification

In this initial phase, we identify key terms vital to our research, resulting in three distinct term sets: Climate, Migration, and Uncertainty. These term sets are derived from previous works by Fraser and Ungor (2019) and Gavriilidis (2021), with subsequent modifications and additions to enhance relevance. The chosen keywords encompass a broad spectrum of factors related to climate change, migration, and uncertainty. The resulting comprehensive sets form the basis for an in-depth exploration of the interplay between climate, migration, and uncertainty. Note that the search process ensures that only articles that jointly report at least one keyword from each of the term sets (Climate, Migration, and Uncertainty) are considered. This process enables the connection of the three distinct terms that culminate into the intended index described as the climate-induced migration uncertainty index.

**Table 1: Selected keywords for each of the components of the index**

<b>Climate</b>	<b>Migration</b>	<b>Uncertainty</b>
carbon dioxide	border control	uncertainty
climate	Schengen	uncertain
climate risk	open borders	unstable
greenhouse gas emissions	migrant	fluctuation
greenhouse	migration	speculation
co2	asylum	complexity
emission	refugee	inconsistency
global warming	immigrant	unpredictability
climate change	immigration	volatility
green energy	immigration	
renewable energy	human trafficking	
environmental	emigration	
carbon footprint	displacement	
climate adaptation	resettlement	
climate mitigation.	integration	
extreme weather events	migrant workers	
adaptation strategies	border crossing	
mitigation efforts	displaced persons	
drought	deportation	
desertification	visa	
flood		
sea level rise		
environment		

## 2.2 Selection of Relevant Newspapers and News Text Downloads

There are myriads of international newspapers; however, our focus is to choose those that can truly represent global news readership. Thus, we adopt the list of 45 major international newspapers by Narayan et. al. (2021). This ensures that the data collected reflects global representation drawn from reputable and authoritative sources, adding an essential layer of validity and trustworthiness to the ensuing analysis (see Appendix 1 for the list of selected newspapers). This strategic selection enhances the credibility and trustworthiness of our data, derived from esteemed and authoritative sources.

Conforming to Proquest TDM studio search guidelines (2022), we end up with the following search terms:

*FULLTEXT( ("carbon dioxide" OR climate OR "climate risk" OR "greenhouse gas emissions" OR greenhouse OR co2 OR emission OR "global warming" OR "climate change" OR "green energy" OR "renewable energy" OR environment OR environmental OR "carbon footprint" OR "climate adaptation" OR "climate mitigation" OR "extreme weather event" OR "adaptation strategies" OR "mitigation effort" OR drought OR desertification OR flood OR "sea level rise") AND ("border control" OR Schengen OR "open borders" OR migrant OR migration OR asylum OR refugee OR immigrant OR immigration OR "human trafficking" OR emigration OR displacement OR resettlement OR integration OR "migrant workers" OR "border crossing" OR "displaced persons" OR deportation OR visa) AND (uncertainty OR uncertainty OR uncertain OR unstable OR fluctuation OR speculation OR complexity OR inconsistency OR unpredictability OR volatility))*

The search term is meticulously crafted to encompass the identified keywords. The resulting search query is executed across the chosen set of 45 international newspapers, and the ensuing dataset is systematically downloaded. Subsequently, employing the Proquest TDM platform's Jupyter notebook, text preprocessing techniques and preliminary analyses are executed on the acquired news.

## 3. An Overview of the Index

We construct our index by counting the number of articles with at least one term from each of the Climate, Migration, and Uncertainty term sets (see Appendix 2 for details on the total articles and those specific to the index) and normalizing the data with the formula [xnormalized

=100\* (x - xminimum) / range of x] such that the values range between 0 and 100 with greater values implying rising uncertainty and the converse for lower values.<sup>7</sup>

Our index shows that climate-induced migration uncertainty has surged in recent years, with the most prominent spikes beginning only decades ago. The index reflects some of the most devastating climate disasters that have resulted not only in loss of lives and property but also in mass migration of people. For example, the prolonged drought experienced in the Horn of Africa between 2010 and 2011, which resulted in extreme food insecurity and mass displacement of people in Kenya, Ethiopia and Somalia, was appropriately captured in the index. Other serious natural disasters like hurricanes, tornados and wildfires, which generated serious concerns, especially in international media, were reflected in the index. The 2021 intense wildfires in Greece and some parts of Turkey, which led to forced evacuation, and cyclone Fani, which displaced millions of people in India and Bangladesh in 2019 after being rendered homeless, are other examples of climate-induced migration events illustrated on the graph. It is worth mentioning that events taking place in countries with very strong media are likely to have more prominent representation in our index than those in countries with less media presence, given the nature of our methodology, which is text mining. We attribute the marked differences observed in spikes in climate change now and in the past to two factors. One is the level of awareness of climate change issues, which has seen significant improvement in recent years, and two is the advancement in technology, which has seen the rapid development and adoption of social media through which the world has become more globalized.

We find our index to be validated by earlier studies like Simon Kuznets' Environmental Kuznet Curve (EKC). The EKC stipulates that in the early stages of economic growth, pollution emissions increase and environmental quality declines (Stern, 2018). Since the last three decades, there have been more newly industrializing countries whose activities have generally increased global warming and accelerated the rate of climate change, a phenomenon that explains the upward trending nature of our graph. According to Kuznets, the world is likely to witness an increase in climate-induced migration uncertainty as more countries industrialize, although this will eventually fall as industrialized countries become more environmentally responsible. Consequently, it is consistent to say that developed countries contribute or have contributed more to climate-induced migration uncertainty than others.

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<sup>7</sup> Note that range of x = xmaximum – xminimum.

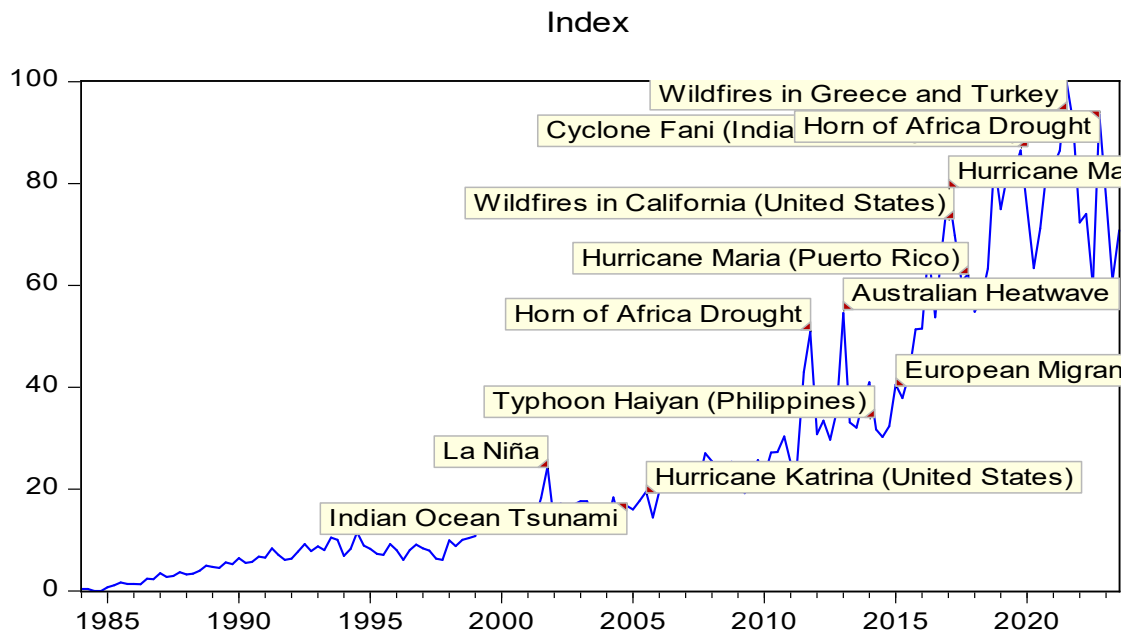


Figure 1: Trends in global climate-induced migration uncertainty

#### 4. Conclusion and Future Research Agenda

The increasing frequency of climate-related disasters, which often pose life-threatening risks, has led to a rise in permanent migration for survivors. Hence, it is crucial to have an index that measures the uncertainty associated with climate-related migration. While there exist indices for climate and migration, we propose an index that links migration to climate-related events. This index can have several applications in research. Firstly, it can aid in the analysis and policy formation of housing markets since climate change can serve as a significant factor affecting housing supply. The index can help understand how climate-induced migration uncertainty impacts the supply of housing units and subsequently affects their prices. Secondly, the index can be useful when valuing domestic and international stocks, as it can be a risk factor influencing stock prices, returns and volatility. Climate change affects the proper functioning of the financial system, which can lead to spillover effects on other sectors of the economy. Lastly, the index can initiate discussions on the need to address the adverse ecological effects of climate change, particularly as it relates to migration on a global scale.



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## Appendix 1

BBC  
Manila Bulletin  
The Australian  
The Guardian  
The Scotsman  
The Irish Examiner  
Australian Broadcasting Corporation  
The Canadian Press  
The Herald (Glasgow, Scotland)  
Calgary Herald  
ArabianBusiness.com  
China Daily  
The Independent  
Times of India  
Pakistan Press International Information Services  
All Africa  
Toronto Star  
Kuwait News Agency (Kuna)  
The Australian Financial Review  
Business World (Philippines)  
The Advertiser (Adelaide)  
The Globe and Mail  
The New York Times  
Press Trust of India  
Xinhua News Agency  
Kyodo News The Hindu (India)  
The Wall Street Journal T  
The Times (U.K.)  
Jiji Press  
The Telegraph (U.K.)  
The Daily Express (U.K.)  
National Post  
EFE News Service  
Daily Mail (U.K.)  
Los Angeles Times  
Ottawa Citizen  
The Irish Times  
USA Today  
South China Morning Post  
The New Zealand Herald  
The Washington Post  
Irish Independent  
Chicago Tribune

## Appendix 2

### 1. Chicago Tribune

1. News articles with at least one of the keywords from all the categories - 228,382 (Jan 01, 1985 to Aug 29, 2023)
2. News articles with at least one keyword from each of the category - 171 (Mar 10, 1985 to Aug 03, 2023)
3. Total news articles - 4,223,789 (Jan 01, 1985 to Aug 29, 2023)

### 2. BBC

1. News articles with at least one of the keywords from all the categories - 363,142 (JUL 20, 1998 - AUG 28, 2023)
2. News articles with at least one keyword from each of the category - 489 (OCT 06, 1999 - AUG 28, 2023)
3. Total BBC news articles - 4,397,727 (JUL 20, 1998 - AUG 28, 2023)

### 3. Irish Independent

1. News articles with at least one of the keywords from all the categories - 49,557 (Jun 22, 2006 to Sep 05, 2023)
2. News articles with at least one keyword from each of the category - 61 (Jan 19, 2008 to Jul 24, 2023)
3. Total news articles - 700,209 (Jun 16, 2006 to Sep 05, 2023)

### 4. Sputnik News Service

1. News articles with at least one of the keywords from all the categories - 27,581 (Mar 27, 2017 to Dec 01, 2021)
2. News articles with at least one keyword from each of the category - 25 (Sep 19, 2017 to Jan 11, 2021)
3. Total news articles - 314,330 (Mar 27, 2017 to Dec 01, 2021)

### 5. The Washington Post

1. News articles with at least one of the keywords from all the categories 250,175 (Jan 01, 1987 to Sep 05, 2023)
2. News articles with at least one keyword from each of the category - 970 (Jan 20, 1987 to Aug 24, 2023)
3. Total news articles - 1,751,887 (Jan 01, 1987 to Sep 05, 2023)

### 6. The New Zealand Herald

1. News articles with at least one of the keywords from all the categories 50,799 (Dec 13, 2004 to Sep 06, 2023)
2. News articles with at least one keyword from each of the category - 115 (Sep 09, 2005 to May 06, 2023)
3. Total news articles - 462,887 (Nov 09, 2004 to Sep 06, 2023)

### 7. South China Morning Post

1. News articles with at least one of the keywords from all the categories 117,216 (Jan 01, 1993 to Sep 06, 2023)
2. News articles with at least one keyword from each of the category - 169 (May 16, 1994 to Sep 03, 2023)
3. Total news articles - 926,571 (Jan 01, 1993 to Sep 06, 2023)

8. USA Today
  1. News articles with at least one of the keywords from all the categories 100,052 (Apr 01, 1987 to Sep 05, 2023)
  2. News articles with at least one keyword from each of the category - 247 (Apr 10, 1989 to Aug 19, 2023)
  3. Total news articles 1,538,172 (Jan 01, 1915 to Sep 05, 2023)
9. The Irish Times
  1. News articles with at least one of the keywords from all the categories 137,100 (Jan 02, 1995 to Sep 07, 2023)
  2. News articles with at least one keyword from each of the category - 204 (Feb 03, 1995 to Sep 02, 2023)
  3. Total news articles 1,453,770 (Jan 02, 1995 to Sep 07, 2023)
10. Ottawa Citizen
  1. News articles with at least one of the keywords from all the categories 145,730 (Sep 03, 1985 to Sep 06, 2023)
  2. News articles with at least one keyword from each of the category - 178 (Nov 09, 1985 to Aug 29, 2023)
  3. Total news articles 1,638,276 (Sep 03, 1985 to Sep 06, 2023)
11. Los Angeles Times
  1. News articles with at least one of the keywords from all the categories 328,233 (Jan 01, 1985 to Sep 07, 2023)
  2. News articles with at least one keyword from each of the category - 731 (Jan 01, 1985 to Sep 06, 2023)
  3. Total news articles 3,678,523 (Sep 03, 1985 to Sep 06, 2023)
12. Daily Mail (UK)
  1. News articles with at least one of the keywords from all the categories 295,555 (Dec 31, 1991 to Sep 07, 2023)
  2. News articles with at least one keyword from each of the category - 200 (May 13, 1998 to Sep 06, 2023)
  3. Total news articles 5,179,324 (Dec 31, 1991 to Sep 07, 2023)
13. EFE News Service
  1. News articles with at least one of the keywords from all the categories 39,649 (Apr 28, 2008 to Sep 09, 2023)
  2. News articles with at least one keyword from each of the category - 30 (May 07, 2008 to Apr 19, 2022)
  3. Total news articles 3,146,995 (Apr 28, 2008 to Sep 09, 2023)
14. National Post
  1. News articles with at least one of the keywords from all the categories 234,614 (Oct 27, 1998 to Sep 08, 2023)
  2. News articles with at least one keyword from each of the category - 438 (Jan 09, 1999 to Jul 26, 2023)
  3. Total news articles 2,099,149 (Jan 01, 1992 to Sep 08, 2023)

15. The Daily Express (U.K.)
  1. News articles with at least one of the keywords from all the categories 33,939 (Sep 05, 2015 to Sep 09, 2023)
  2. News articles with at least one keyword from each of the category - 25 (Jun 23, 2016 to Dec 03, 2022)
  3. Total news articles 632,342 (Dec 30, 1992 to Sep 09, 2023)
  
16. The Telegraph (U.K.)
  1. News articles with at least one of the keywords from all the categories 345,139 (Nov 05, 1831 to Sep 09, 2023)
  2. News articles with at least one keyword from each of the category - 349 (May 14, 1991 to Aug 22, 2023)
  3. Total news articles 5,466,277 (Oct 22, 1831 to Sep 09, 2023)
  
17. Jiji Press
  1. News articles with at least one of the keywords from all the categories 19,505 (Feb 12, 1998 to Sep 08, 2023)
  2. News articles with at least one keyword from each of the category - 1 (Nov 13, 2018 to Nov 13, 2018)
  3. Total news articles 363,894 (Feb 12, 1998 to Sep 08, 2023)
  
18. The Times (U.K.)
  1. News articles with at least one of the keywords from all the categories 426,682 (an 01, 1887 to Sep 08, 2023)
  2. News articles with at least one keyword from each of the category - 549 (Sep 22, 1923 to Jul 07, 2023)
  3. Total news articles 6,323,096 (Jan 01, 1887 to Sep 09, 2023)
  
19. The Wall Street Journal
  1. News articles with at least one of the keywords from all the categories 216,587 (Jan 02, 1984 to Sep 09, 2023)
  2. News articles with at least one keyword from each of the category - 376 (Feb 17, 1984 to Jun 16, 2023)
  3. Total news articles 2,280,469 (Jan 05, 1982 to Sep 09, 2023)
  
20. Kyodo News The Hindu
  1. News articles with at least one of the keywords from all the categories 5,902 (Dec 13, 2013 to Apr 01, 2021)
  2. News articles with at least one keyword from each of the category - 10 (Oct 15, 2015 to Jul 08, 2020)
  3. Total news articles 59,391 (Dec 13, 2013 to Apr 01, 2021)
  
21. Xinhua News Agency
  1. News articles with at least one of the keywords from all the categories 198,631 (Jan 27, 1998 to Mar 02, 2022)
  2. News articles with at least one keyword from each of the category - 141 (Sep 10, 2002 to Feb 18, 2022)
  3. Total news articles 2,613,614 (Jan 03, 1998 to Mar 02, 2022)

22. Press Trust of India
  1. News articles with at least one of the keywords from all the categories 5,450 (Sep 01, 2010 to Mar 30, 2012)
  2. News articles with at least one keyword from each of the category - 1 Feb 02, 2012 to Feb 02, 2012)
  3. Total news articles 183,374 (Sep 01, 2010 to Mar 30, 2012)
  
23. The New York Times
  1. News articles with at least one of the keywords from all the categories 77,186 (Aug 01, 1992 to Sep 10, 2023)
  2. News articles with at least one keyword from each of the category - 257 (Dec 11, 1992 to Aug 24, 2023)
  3. Total news articles 475,015 (Aug 01, 1992 to Sep 10, 2023)
  
24. The Globe and Mail
  1. News articles with at least one of the keywords from all the categories 371,565 (Nov 14, 1977 to Sep 12, 2023)
  2. News articles with at least one keyword from each of the category - 883 (Nov 18, 1977 to Sep 01, 2023)
  3. Total news articles 4,713,430 (Nov 14, 1977 to Sep 12, 2023)
  
25. The Advertiser (Adelaide)
  1. News articles with at least one of the keywords from all the categories 88,924 (Jan 01, 2001 to Sep 12, 2023)
  2. News articles with at least one keyword from each of the category - 65 (Mar 10, 2001 to Aug 12, 2023)
  3. Total news articles 1,563,853 (Jan 01, 2001 to Sep 12, 2023)
  
26. Vermont Business Magazine
  1. News articles with at least one of the keywords from all the categories 12,723 (Jan 28, 2010 to Sep 12, 2023)
  2. News articles with at least one keyword from each of the category - 19 (Feb 24, 2018 to Oct 06, 2022)
  3. Total news articles 105,903 (Jan 18, 2010 to Sep 12, 2023)
  
27. The Australian Financial Review
  1. News articles with at least one of the keywords from all the categories 46,265 (Sep 02, 2013 to Sep 12, 2023)
  2. News articles with at least one keyword from each of the category - 160 (Sep 06, 2013 to Sep 12, 2023)
  3. Total news articles 243,721 (Sep 02, 2013 to Sep 12, 2023)
  
28. Kuwait News Agency
  1. News articles with at least one of the keywords from all the categories 19,375 (Sep 27, 2009 to Sep 11, 2023)
  2. News articles with at least one keyword from each of the category - 15 (Apr 27, 2010 to Jun 30, 2023)
  3. Total news articles 233,362 (Sep 27, 2009 to Sep 12, 2023)

29. Toronto Star
  1. News articles with at least one of the keywords from all the categories 213,692 (May 11, 1973 to Sep 11, 2023)
  2. News articles with at least one keyword from each of the category - 358 (Jul 20, 1986 to Sep 03, 2023)
  3. Total news articles 2,124,444 (May 11, 1973 to Sep 11, 2023)
30. All Africa
  1. News articles with at least one of the keywords from all the categories 286,569 (Feb 06, 2009 to Sep 12, 2023)
  2. News articles with at least one keyword from each of the category - 548 (Mar 21, 2011 to Aug 14, 2023)
  3. Total news articles 4,239,914 (May 11, 1973 to Sep 11, 2023)
31. Pakistan Press International Information Services
  1. News articles with at least one of the keywords from all the categories 27,894 (Mar 05, 2010 to Sep 11, 2023)
  2. News articles with at least one keyword from each of the category - 37 (Mar 23, 2010 to Aug 09, 2023)
  3. Total news articles 708,760 (Mar 05, 2010 to Sep 11, 2023)
32. Times of India
  1. News articles with at least one of the keywords from all the categories 214,112 (Jan 06, 2006 to Sep 12, 2023)
  2. News articles with at least one keyword from each of the category - 76 (Mar 06, 2009 to Jun 23, 2023)
  3. Total news articles 5,128,637 (Jan 06, 2006 to Sep 12, 2023)
33. The Independent
  1. News articles with at least one of the keywords from all the categories 162,257 (Sep 30, 1993 to Sep 14, 2023)
  2. News articles with at least one keyword from each of the category - 243 (Aug 20, 1994 to Jul 12, 2023)
  3. Total news articles 1,755,870 (Sep 30, 1993 to Sep 14, 2023)
34. China Daily
  1. News articles with at least one of the keywords from all the categories 89,021 (Jan 02, 1995 to Oct 06, 2023)
  2. News articles with at least one keyword from each of the category - 192 (Apr 22, 1999 to Sep 14, 2023)
  3. Total news articles 535,560 (Jan 02, 1995 to Oct 06, 2023)
35. ArabianBusiness.com
  1. News articles with at least one of the keywords from all the categories 11,274 (Sep 11, 2008 to Sep 14, 2023)
  2. News articles with at least one keyword from each of the category - 17 (Jul 21, 2009 to Sep 14, 2023)
  3. Total news articles 117,411 (Sep 10, 2008 to Sep 14, 2023)

36. Calgary Herald
  1. News articles with at least one of the keywords from all the categories 133,892 (Dec 07, 1988 to Sep 13, 2023)
  2. News articles with at least one keyword from each of the category - 188 (Mar 12, 1989 to Feb 15, 2023)
  3. Total news articles 1,499,916 (Dec 07, 1988 to Sep 13, 2023)
  
37. The Herald
  1. News articles with at least one of the keywords from all the categories 115,629 (Jan 01, 1998 to Sep 14, 2023)
  2. News articles with at least one keyword from each of the category - 108 (Aug 01, 1998 to Jul 12, 2023)
  3. Total news articles 1,438,382 (Jan 01, 1998 to Sep 14, 2023)
  
38. The Canadian Press
  1. News articles with at least one of the keywords from all the categories 2,821 (Apr 30, 2010 to Oct 06, 2010)
  2. News articles with at least one keyword from each of the category – 0 ( )
  3. Total news articles 47,474 (Apr 30, 2010 to Oct 06, 2010)
  
39. Australian Broadcasting Corporation
  1. News articles with at least one of the keywords from all the categories 21,160 (May 06, 2003 to Sep 12, 2023)
  2. News articles with at least one keyword from each of the category – 51 (Sep 03, 2004 to May 16, 2022)
  3. Total news articles 113,188 (Apr 30, 2003 to Sep 13, 2023)
  
40. The Irish Examiner
  1. News articles with at least one of the keywords from all the categories 46,360 (Apr 25, 2001 to Sep 14, 2023)
  2. News articles with at least one keyword from each of the category – 55 (Jan 06, 2003 to Jul 23, 2023)
  3. Total news articles 589,035 (Apr 24, 2001 to Sep 14, 2023)
  
41. The Scotsman
  1. News articles with at least one of the keywords from all the categories 67,609 (Feb 19, 1998 to Sep 14, 2023)
  2. News articles with at least one keyword from each of the category 83 (Jul 11, 1998 to Jul 24, 2023)
  3. Total news articles 690,524 (Feb 19, 1998 to Sep 14, 2023)
  
42. The Guardian
  1. News articles with at least one of the keywords from all the categories 312,170 (Nov 28, 1807 to Sep 14, 2023)
  2. News articles with at least one keyword from each of the category 970 (Mar 05, 1997 to Sep 14, 2023)
  3. Total news articles 2,717,400 (Nov 28, 1807 to Sep 14, 2023)



43. The Australian

1. News articles with at least one of the keywords from all the categories 174,751 (Jan 01, 2001 to Sep 15, 2023)
2. News articles with at least one keyword from each of the category 545 (Feb 02, 2001 to Aug 25, 2023)
3. Total news articles 1,144,871 (Jan 01, 2001 to Sep 15, 2023)

44. Manila

1. News articles with at least one of the keywords from all the categories 19,718 (Sep 15, 2005 to Sep 15, 2023)
2. News articles with at least one keyword from each of the category 9 (Dec 16, 2018 to Jul 25, 2023)
3. Total news articles 234,221 (Sep 15, 2005 to Sep 15, 2023)