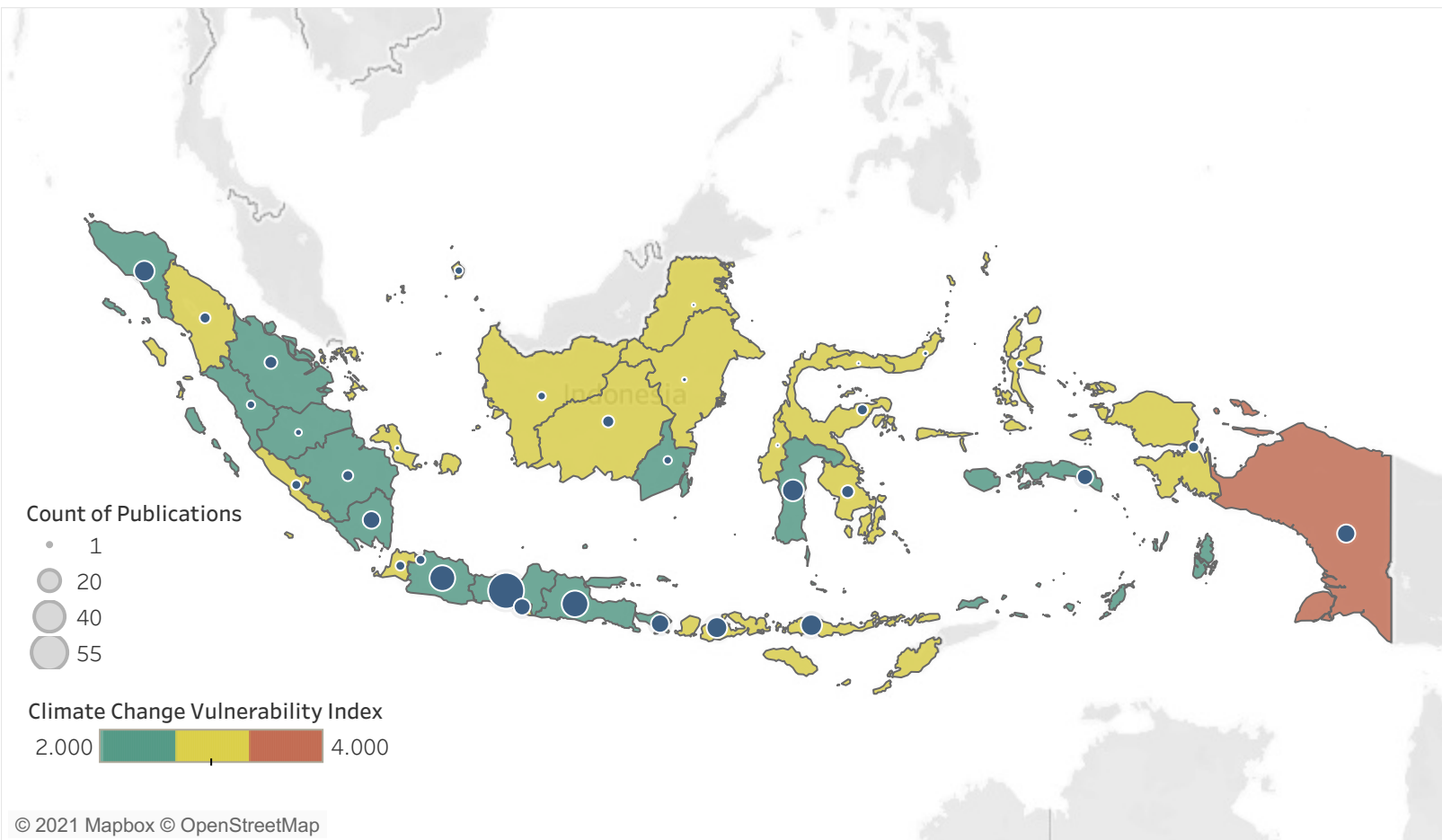


Indonesia Disaster Knowledge Update - September 2021



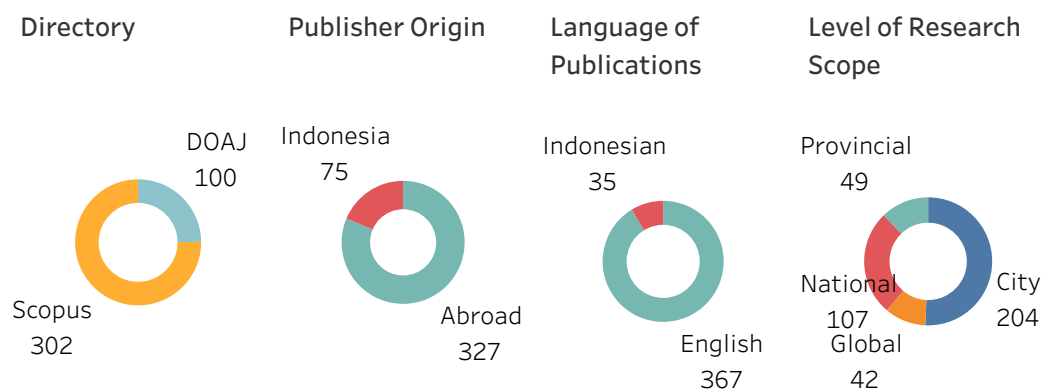
Research publications about Climate Change and Related Hazards



The map shows the distribution of research publications on climate change and its related hazards in every province of Indonesia (source: CARI! repository-of-repositories, 2021). The blue dots and their diameter size represent the count of publications in each province. The map color shade is the climate change vulnerability index (CCVI), with a higher value meaning a higher degree of vulnerability (source: SIDIK-KLHK, 2018). From a total of 402 articles in Indonesia, a portion of 42 articles were analyzed at the global level with implications to Indonesia, 107 at the national level, 49 at the provincial level, and 204 at the city level. The Java, Bali & Nusa Tenggara, and Sumatera Island have relatively high counts of publications. The distribution of research locations does not have any correlation with CCVI values. Some provinces that are more vulnerable have fewer publications, like provinces in the northern part of Sulawesi and Kalimantan islands. The most vulnerable province is Papua, which has only 14 publications.

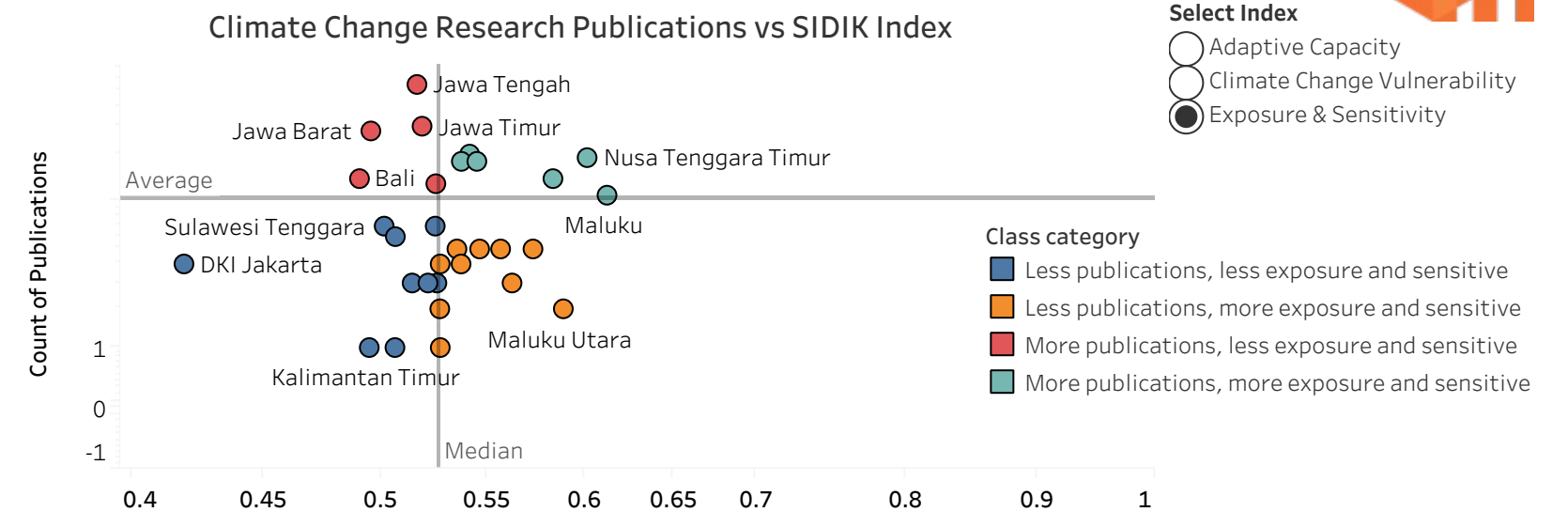
Publication Statistics

402 Publications 214 Publishers 371 Authors



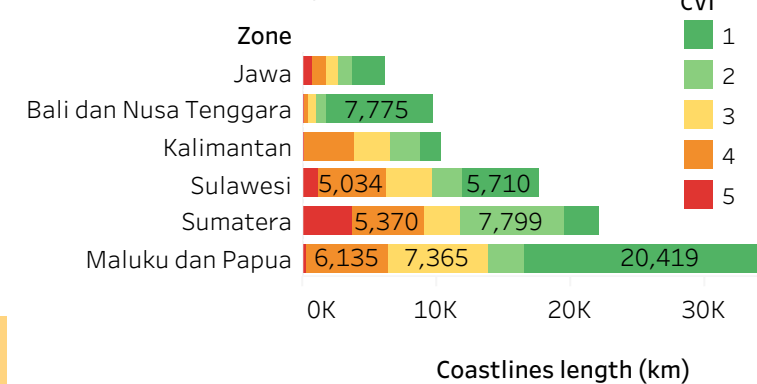
Statistics show research publications about Climate Change and its related hazards in Indonesia published between 1993 and August 2021. These publications are compiled in CARI! repository-of-repositories data, curated from Scopus and Directory of Open Access. 302 publications are sourced from Scopus only, and 100 publications from DOAJ directory. A total of 75 publication titles are from Indonesia and 327 from abroad. These charts include publications written in Bahasa Indonesia and English.

Climate Change Vulnerability in Indonesia

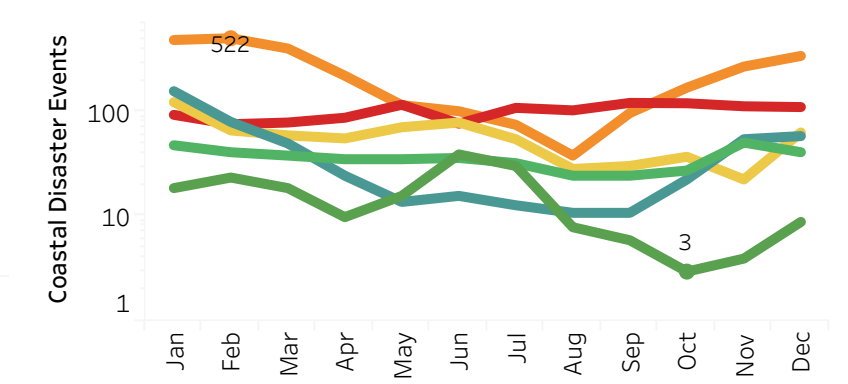


Quadrant plot shows the provinces class category based on Count of Research Publications (CRI) and selected indices of Exposure & Sensitivity Index (ESI), Adaptive Capacity Index (ACI), or Climate Change Vulnerability Index (CCVI) based on KLHK's vulnerability index (the SIDIK), which includes the physical and social factors on their assessment (Source: KLHK, 2018). Eleven provinces have a high count of publications, where 6 of them have high ESI and low ACI. Papua, Nusa Tenggara Barat and Nusa Tenggara Timur are the provinces that have high CRI and high CCVI. Despite have a higher value of ESI, the Aceh and Sulawesi Selatan provinces have a lower CCVI because of the higher ACI. The provinces of Maluku Utara and Papua Barat have higher ESI, but low CRI, therefore this area needs more climate change research in the future. In general, the chart shows that the provinces that have higher CRI, also have higher ACI.

Coastal Vulnerability Index



Coastal Disaster Trend



Zone / Island ■ Maluku & Papua ■ Kalimantan ■ Bali & Nusa Ten.. ■ Sulawesi ■ Sumatera ■ Jawa

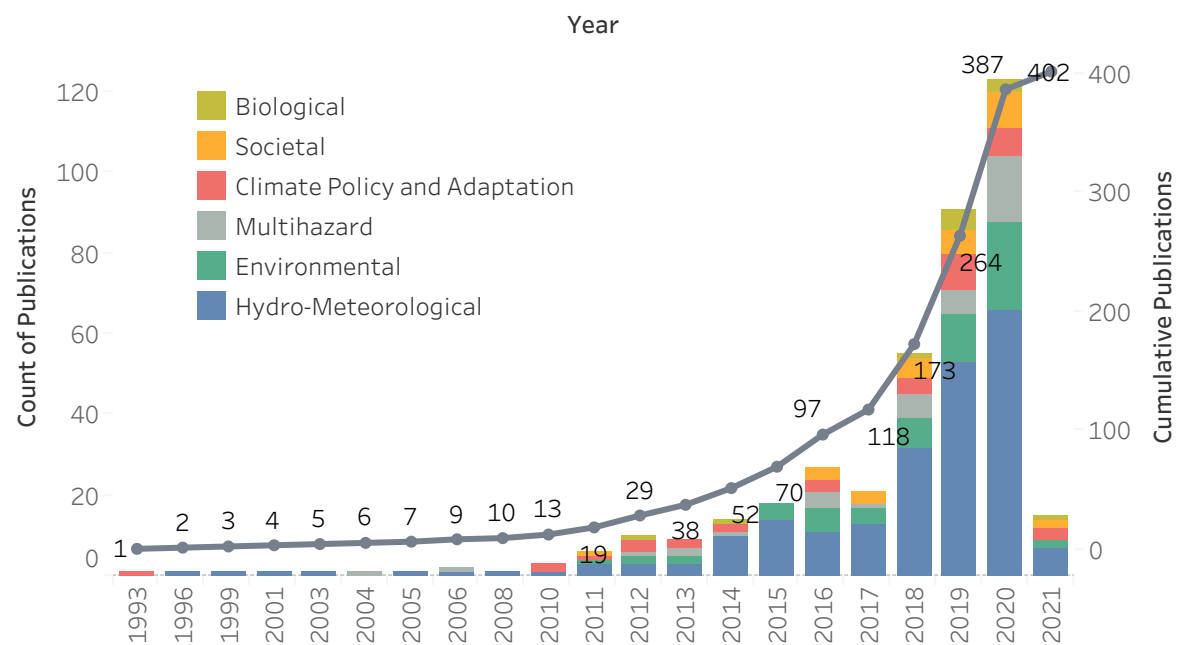
The Coastal Vulnerability Index (CVI) is a measure of coastal vulnerability along the Indonesia coastline, computed mainly due to exposure to physical parameters i.e. significant wave height and tidal height, sea-level rise, coastal slope, coastal geomorphology, and beach erosion data (source: Bappenas, 2018). The coastal hazard trend shows the count of coastal hazard events from 2016-2021 on a monthly basis (source: BNPB, 2021). Sumatera Island has the longest coastlines in CVI of 5 and has a relatively constant of coastal disaster events throughout the year. Locations in Sumatera Island have the most vulnerable coastline relative to other locations. Its western coast lies directly adjacent to the Indian Ocean, which could be struck by a tsunami and other wave incidents, while on the east coast, erosion and human development have threatened the coast. Java Island has the highest population count and its development activities increase the risk in the northern part of coastal areas. The risk is often transformed into coastal disaster events that occur following the monsoon season and is directly linked with the hydrological cycle. Even though Maluku and Papua islands have the longest coastline, provinces in both islands have fewer coastal disaster events due to their coastal morphology, which is composed of cliffs and rocks, and their relatively healthy coastal ecosystems such as mangroves and coral reefs.

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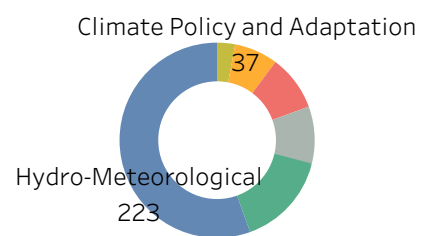


Publications Category
All

Trend of Climate Change and Its Related Hazards Research Publications



Category composition



Since 1993, the number of climate change research publications grows exponentially until 2020. The hydro-meteorological hazard category dominates the portion of publications in all years. It is followed by environmental category, multihazards, climate adaptation & policy, societal, and biological or health-related category. The publication category was adapted from climatic impact-driver terms introduced in Chapter 12 of IPCC AR6 Reports and integrated into the UNDRR (2020) hazards cluster list. The publications compiled do not include those about anthropogenic factors of climate change (i.e. about GHGs emissions).

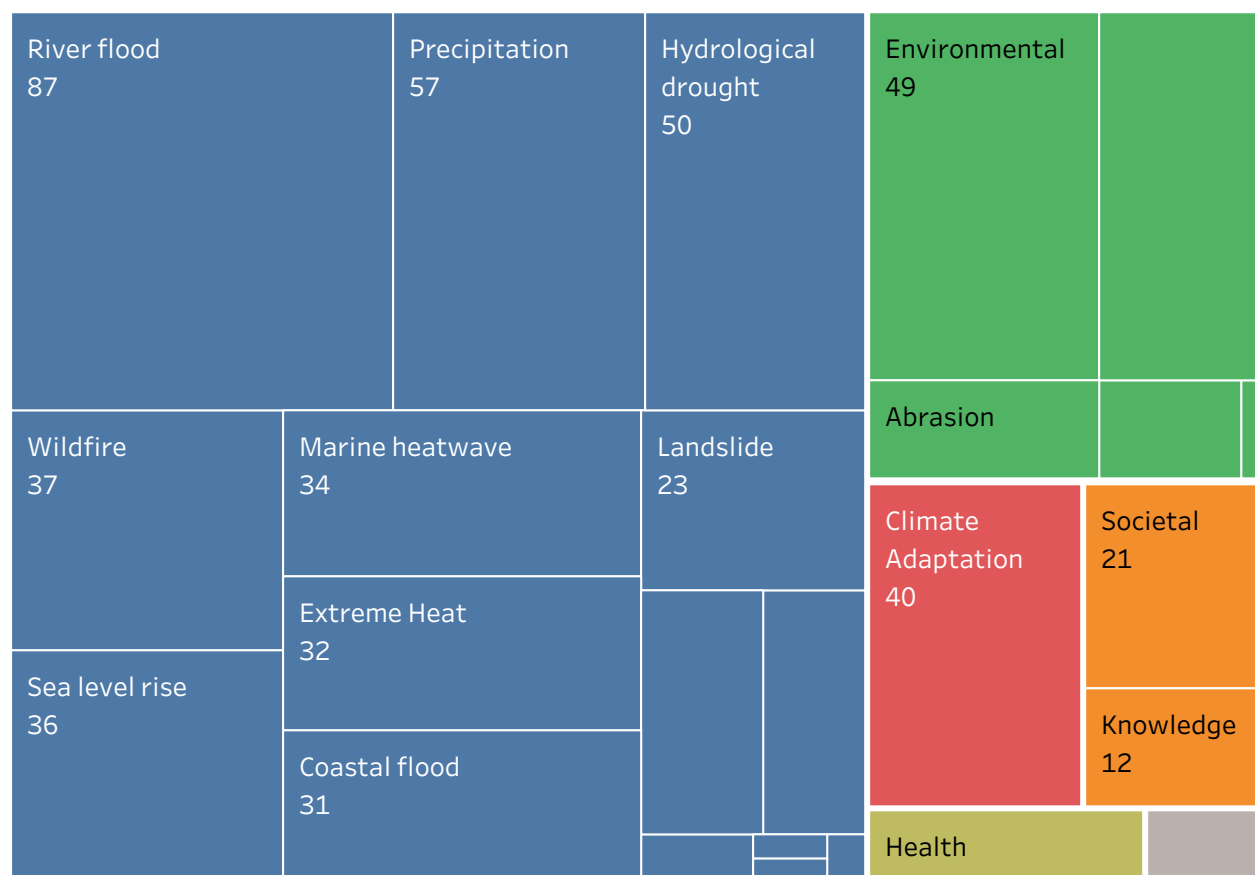
Top Articles

- Framing the application of adaptation pathways for rural livelihoods and global change in eastern Indonesian islands**
Butler J. | Global Environmental Change
Published on 2014-09-01 | cited by 71 articles
- Acclimation and adaptation of scleractinian coral communities along environmental gradients within an Indonesian reef system**
Hennige S.J. | Journal of Experimental Marine Biology and Ecology
Published on 2010-08-01 | cited by 62 articles
- Local perceptions of climate variability and change in tropical forests of Papua, Indonesia**
Boissière M. | Ecology and Society
Published on 2013-12-01 | cited by 50 articles
- Effects of interannual climate variability and climate change on rice yield in Java, Indonesia**
Amien I. | Water, Air, and Soil Pollution
Published on 1996-12-01 | cited by 41 articles
- Priming adaptation pathways through adaptive co-management: Design and evaluation for developing countries**
Butler J. | Climate Risk Management
Published on 2016-01-01 | cited by 36 articles

The top-five publications on climate change and its related hazards in Indonesia are shown. The selection criteria are based on the number of citations from 1993 to 2021 based on the Scopus repository. Topics related to climate change adaptation policy have a high interest despite the relatively low numbers of publications, in comparison to the hydro-meteorological and environmental category.

Top Sub-category or Hazards

Category All



Top Research Topics by Disaster Management Phase

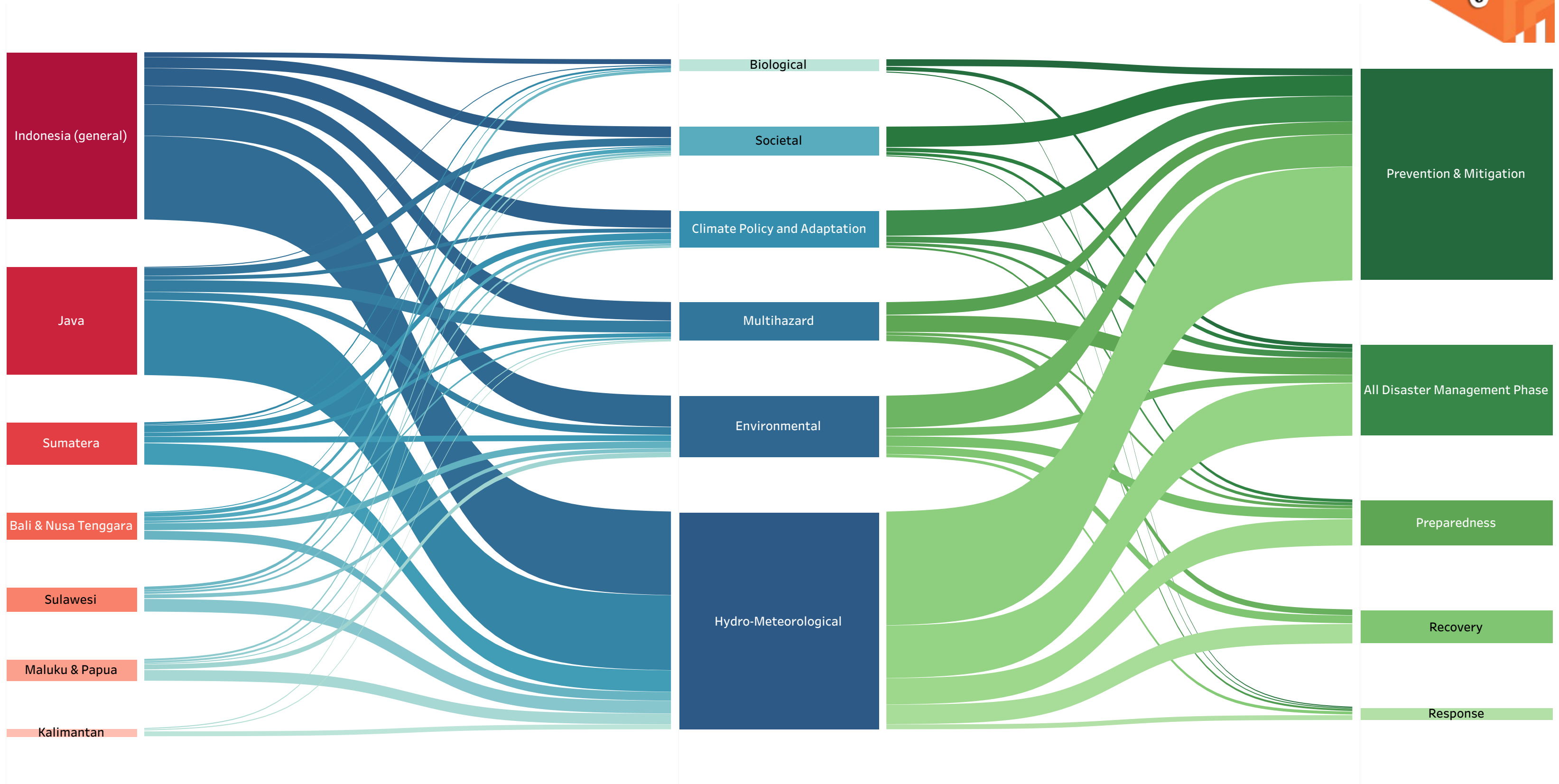


Top Investigated Provinces



River floods, changes in precipitation patterns, hydrological drought, and environmental degradation are the most studied hazards related to climate change. The combined hazards of a coastal flood, abrasion, extreme waves, and sea-level rise have also become among the most studied hazards in the coastal hazards category with a total of 81 publications. Within the disaster management phase, many researchers studied hazard & impact assessments and topics related to means and techniques in improving lives & infrastructure. Hazard and impact assessment are important to reduce the risk of potential disaster events in the future, and improving lives & infrastructure are needed to better adapt to changing climate and its risk.

This Month's Sankey Diagram of Climate Change and related hazards publications: Island to Hazards to DRM Phase



This Sankey diagram was calculated based on the number of articles. One article only represents one value of the Sankey flow. The climate change researcher has a relatively greater interest in a wider scope of analysis, i.e. at the national level or by analyzing multiple cities from all regions in Indonesia. A total of 110 articles published include analysis in locations within Java Island or by researchers based in an institution based in Java. Out of the Java Island region, the articles published here are fewer, even if it's all combined together. Hydro-meteorological hazards such as extreme weather, drought, and floods, are the most studied from all of the regions with 223 articles. Then followed by environmental hazards such as agricultural drought, forest degradation, and so on. The climate policy and adaptation have relatively big portions of articles coming from the national-level studies. Among the disaster risk management phase, prevention & mitigation have the largest portion with 217 articles, followed by a general analysis regardless of the disaster management phase, preparedness, recovery, and lastly on emergency response. This concludes that the research on climate change and its related hazards in Indonesia is still Java-centric. The Sankey Diagram also informs locations, type of hazards, and phase of disaster risk management that requires more research. Researchers are encouraged to cover this issue by investigating the more at-risk locations with a higher coastal vulnerability, e.g. locations in Sumatra and locations with high climate vulnerability in Papua.