

Mapping the Evolution of Community Resilience Research: A Scopus-Based Bibliometric Analysis

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ABSTRAK

Ketahanan komunitas (*community resilience*) telah menjadi bidang penelitian yang semakin penting seiring meningkatnya tantangan global yang berkaitan dengan perubahan iklim, ketidakpastian lingkungan, dan gangguan sosial-ekologis. Penelitian ini bertujuan untuk memetakan dan menganalisis perkembangan global, struktur intelektual, serta tren penelitian yang berkembang dalam kajian ketahanan komunitas melalui pendekatan bibliometrik. Data penelitian diperoleh dari basis data Scopus dan dianalisis menggunakan perangkat lunak VOSviewer untuk mengidentifikasi tren publikasi, jaringan kolaborasi penulis, kolaborasi institusi dan negara, pola keterkaitan kata kunci, serta struktur sitasi. Hasil penelitian menunjukkan bahwa kajian ketahanan komunitas berkembang melalui beberapa kelompok kolaborasi yang saling terhubung, meskipun kerja sama internasional dan antar institusi masih relatif terfragmentasi. Amerika Serikat, Prancis, dan Spanyol menjadi negara kontributor utama dengan jaringan kolaborasi internasional yang kuat. Analisis ko-okurensi kata kunci menunjukkan empat klaster tematik utama yang mencakup ketahanan sosial-ekologis dan tata kelola, perspektif biologis dan evolusioner, dimensi kesehatan manusia dan masyarakat, serta dinamika komunitas mikroba, dengan perubahan iklim dan ketahanan (*resilience*) sebagai tema konseptual utama. Analisis sitasi menunjukkan bahwa bidang ini dipengaruhi oleh berbagai karya fundamental lintas disiplin dalam teori ketahanan ekologi, kesehatan planet (*planetary health*), dan ekologi evolusioner. Penelitian ini memberikan kontribusi berupa pemetaan komprehensif perkembangan riset ketahanan komunitas secara global dengan mengidentifikasi fondasi intelektual, pola kolaborasi, dan arah penelitian masa depan, serta menunjukkan semakin kuatnya integrasi perspektif terkait perubahan iklim dan pendekatan interdisipliner dalam studi ketahanan.

ABSTRACT

Community resilience has become an increasingly important research area due to growing global challenges related to climate change, environmental uncertainty, and socio-ecological disruptions. This study aims to map and analyze the global development, intellectual structure, and emerging research trends in community resilience through a bibliometric approach. Data were collected from the Scopus database and analyzed using VOSviewer to examine publication trends, co-authorship networks, institutional and country collaborations, keyword co-occurrence patterns, and citation structures. The findings indicate that community resilience research has developed through several interconnected collaborative groups, although international and institutional cooperation remains relatively fragmented. The United States, France, and Spain represent major contributors with

strong international research connections. Keyword analysis reveals four dominant thematic clusters encompassing socio-ecological and governance resilience, biological and evolutionary perspectives, human and public health dimensions, and microbial community dynamics, with climate change and resilience emerging as central research themes. Citation analysis demonstrates that the field is strongly influenced by interdisciplinary foundations in ecological resilience theory, planetary health, and evolutionary ecology. This study contributes a comprehensive global research mapping of community resilience by identifying intellectual foundations, collaboration patterns, and future research directions, highlighting the increasing integration of climate-related and interdisciplinary perspectives in resilience studies.

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1. INTRODUCTION

Investigations into how social groups, settlements, and social-ecological systems withstand, adapt to, and recover from disturbance have long converged on the construct of community resilience, which has since emerged as a central theme in contemporary research on natural hazards, climate stress, disease outbreaks, and socio-economic shocks. At its core, resilience denotes the capacity of a system to absorb disturbance, reorganize, and retain essentially the same function, structure, and identity while undergoing change (Folke, 2016). Building on this ecological origin, subsequent scholarship has reframed resilience as a socially and politically contested concept, arguing that who benefits from resilience-building interventions, and whose vulnerabilities are addressed, is inherently shaped by governance structures and power relations (Cretney, 2014).

It is evident that the conceptual trajectory of community resilience owes much to earlier ecological theorizing on adaptive capacity, which established that novelty and reorganization following disturbance are as important to system persistence as stability itself (Allen & Holling, 2010). As climate change, biodiversity loss, and public-health emergencies have intensified over the past two decades, resilience thinking has extended well beyond ecology into human health and planetary well-being, with cross-disciplinary commissions explicitly linking environmental change to human health outcomes and calling for resilient governance systems capable of safeguarding both (Whitmee et al., 2015). This broadening of scope has gradually positioned community resilience as a bridging concept connecting environmental science, public health, disaster studies, and social policy.

The growing global interest in community resilience has, in turn, produced a rich and heterogeneous body of scholarly literature spanning ecology, rural sociology, disaster risk management, urban studies, and microbiology. Empirical work has shown, for instance, that the resilience of rural communities depends on complex interactions between demographic decline, economic restructuring, and local governance capacity (Li et al., 2019), while historical analyses of community responses to hazards emphasize the enduring role of social capital and mutual aid networks in sustaining resilience over generations (Bankoff, 2007). As this literature continues to expand across disciplines, it becomes increasingly difficult for researchers and practitioners to

maintain a comprehensive and structured understanding of the field's leading contributors, institutional actors, and intellectual trajectory.

Disaster risk scholars have further argued that resilience and vulnerability are complementary rather than opposing lenses for understanding how communities anticipate, absorb, and recover from hazard exposure, and that integrating the two concepts is essential for effective disaster risk management (Fekete et al., 2014), (Lei et al., 2014). More recent reviews have traced the conceptual evolution of disaster risk resilience itself, noting a shift from static, capacity-based definitions toward dynamic, process-oriented framings that account for learning and transformation over time (Graveline & Germain, 2022). Without a systematic overview of this expanding knowledge base, including who produces the knowledge and where, scholars run the risk of overlooking important collaborative structures, duplicating prior efforts, or failing to identify significant thematic gaps.

Bibliometric analysis offers a robust quantitative framework for examining not only the thematic evolution of a research field but also its social and institutional architecture, including co-authorship patterns, institutional collaboration, and international participation. Prior bibliometric investigations of community resilience have provided useful but time-bound snapshots of the field's keyword structure (Yang et al., 2021), while parallel bibliometric work on the COVID-19 literature has demonstrated how topic mapping can reveal the way research themes evolve and reorganize during periods of acute global stress (Zhang et al., 2021). Nonetheless, comprehensive bibliometric investigations that jointly map the collaborative networks and the intellectual structure of global community resilience research remain relatively limited.

The present study addresses this gap by conducting a comprehensive bibliometric analysis of global research on community resilience, drawing on publication data extracted from the Scopus database. VOSviewer is employed to construct co-authorship, institutional, and country collaboration networks, alongside keyword co-occurrence, overlay, and density visualizations, together providing a multi-dimensional view of the field's social and intellectual structure. In doing so, the study aims to identify leading collaborative clusters, examine the geographic distribution of research contributions, trace the temporal evolution of key research themes, and highlight the most influential publications. By systematically mapping the global research landscape, this study seeks to provide scholars and practitioners with actionable insights into the current state and future trajectories of community resilience research.

2. METHOD

This study adopts a bibliometric methodology to systematically examine the global research landscape of community resilience. Bibliometric analysis is a well-established quantitative approach that enables researchers to evaluate the scientific output and intellectual structure of a research field by analyzing patterns in publication volumes, citation relationships, collaboration networks, and keyword co-occurrence. Such a methodological framework is particularly well suited to the objectives of the present study, as it allows for the systematic mapping of a large and disciplinarily diverse body of literature in an objective and reproducible manner, without the subjectivity inherent in traditional narrative reviews. Accordingly, the methodological design of this study encompasses three primary stages: data collection, data preparation, and bibliometric visualization and analysis

Data for this study were sourced from the Scopus database, chosen for its broad and comprehensive coverage of peer-reviewed academic literature across disciplines including environmental science, public health, disaster and risk studies, social science, and microbiology. The search was structured using keyword queries centered on the construct of community resilience and its key conceptual derivatives, including socio-ecological resilience, disaster resilience, adaptive capacity, and ecosystem resilience. In order to ensure analytical consistency and comparability across records, the search was limited to journal articles, conference papers, and

review articles written in English, while documents lacking sufficient bibliographic information for network construction were excluded during data preparation.

The analysis itself was carried out using VOSviewer, a software application developed specifically for constructing and visualizing bibliometric networks. VOSviewer was applied to construct co-authorship networks at the author, institutional, and country levels in order to reveal the collaborative structure underlying community resilience research, using fractional counting and association-strength normalization to ensure an accurate representation of relational strength among bibliographic items. In parallel, keyword co-occurrence analysis was performed with a minimum occurrence threshold applied to retain only statistically meaningful associations, and the resulting network was examined across three complementary visualization modes: the network map, illustrating thematic clustering; the overlay map, depicting the temporal evolution of themes based on average publication year; and the density map, representing the relative concentration of research intensity around each keyword node (Yang et al., 2021), (Zhang et al., 2021).

In addition, citation analysis was conducted to identify the most influential publications, ranked by total citation count as reported in Scopus, so as to complement the network-based findings with an assessment of the field's most consequential intellectual contributions.

3. RESULT AND DISCUSSION

3.1 Result

a. Co-Authorship Analysis

The following figure presents a VOSviewer co-authorship network visualization illustrating the collaborative structure among leading authors in the global research field of community resilience.

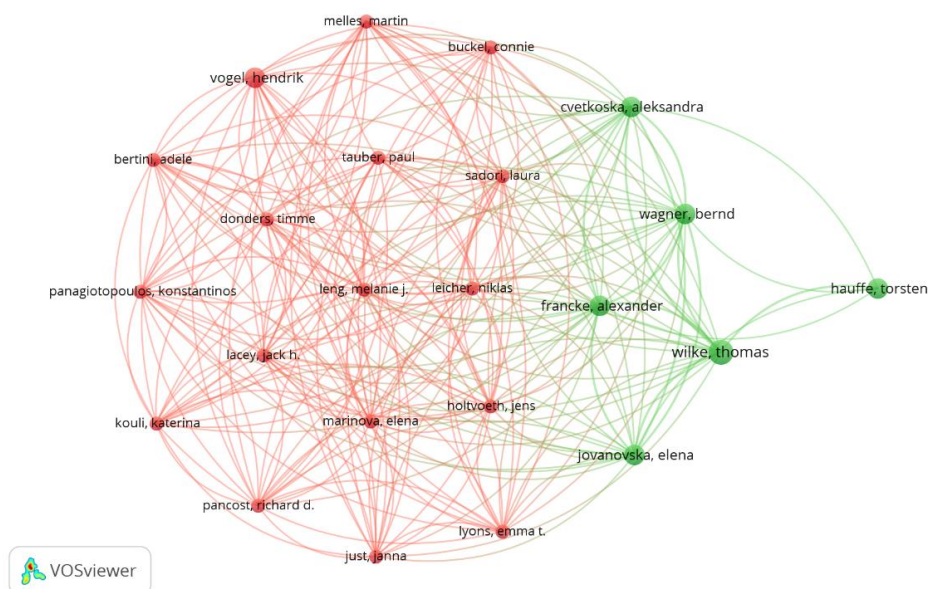


Figure 1. Author Visualization

Source: Data Analysis, 2026

As shown in the network map, author-level collaboration in this segment of the community resilience literature is organized into two tightly interconnected clusters rather than a single unified community, which suggests that this body of scholarship is largely produced by a small number of dedicated research teams. The red cluster, anchored by Panagiotopoulos, Holtvoeth, Kouli, Marinova, Lacey, Lyons, Buckel, Bertini, Donders, Just, Leicher, Leng, Melles, Pancost, Sadori, Tauber, and Vogel, corresponds to a large collaborative team investigating the long-term ecological resilience and vegetation succession of an ancient lake ecosystem through sediment-

based reconstruction (Jovanovska et al., 2016), (Panagiotopoulos et al., 2020). The green cluster, comprising Cvetkoska, Wagner, Francke, Wilke, Jovanovska, and Hauffe, represents a closely related but analytically distinct team examining the differential resilience of ancient sister lake ecosystems to environmental disturbance (Jovanovska et al., 2016).

Notably, several authors including Cvetkoska, Francke, Jovanovska, Wagner, and Wilke appear in both clusters, acting as bridging nodes that connect the two research teams into what is, in effect, a single cohesive intellectual lineage centered on the long-term, paleoecological dimension of ecosystem resilience. Hauffe, by contrast, occupies a comparatively peripheral position, linked to the network mainly through Wilke, which points to a more selective pattern of engagement rather than full integration into the core collaborative team. Taken together, the structure of this network implies that, at least within this segment of the field, knowledge production on ecosystem resilience is concentrated among a closely knit circle of specialists rather than distributed across a broad, loosely connected community of authors.

The following figure illustrates a VOSviewer network of institutional co-authorship relations in the field of community resilience, highlighting collaboration patterns among research institutions.

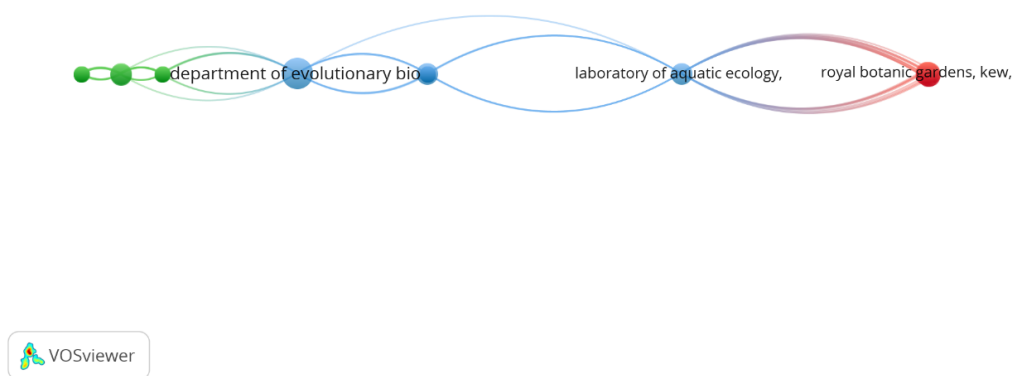


Figure 2. Institution Visualization

Source: Data Analysis, 2026

In contrast to the tightly bound author-level clusters, the institutional collaboration network is notably sparse, with only a small number of institutions surpassing the minimum threshold for visualization. Rather than forming a dense, interconnected hub, the network is composed of a handful of small, largely disconnected components, including a short chain linking a department of evolutionary biology, a laboratory of aquatic ecology, and the Royal Botanic Gardens, Kew.

This chain-like configuration, in which each institution connects to at most one or two neighbors rather than to the network as a whole, suggests that institutional partnerships in this field tend to be built around specific joint projects rather than sustained, multi-project alliances. Such a pattern indicates that formal institutional collaboration in community resilience research remains limited relative to author-level collaboration, implying that much of the field's collaborative activity occurs through individual research partnerships that have not yet translated into stable, cross-institutional structures capable of anchoring long-term research programs.

The following figure presents a VOSviewer country co-authorship network illustrating international collaboration patterns in research on community resilience.

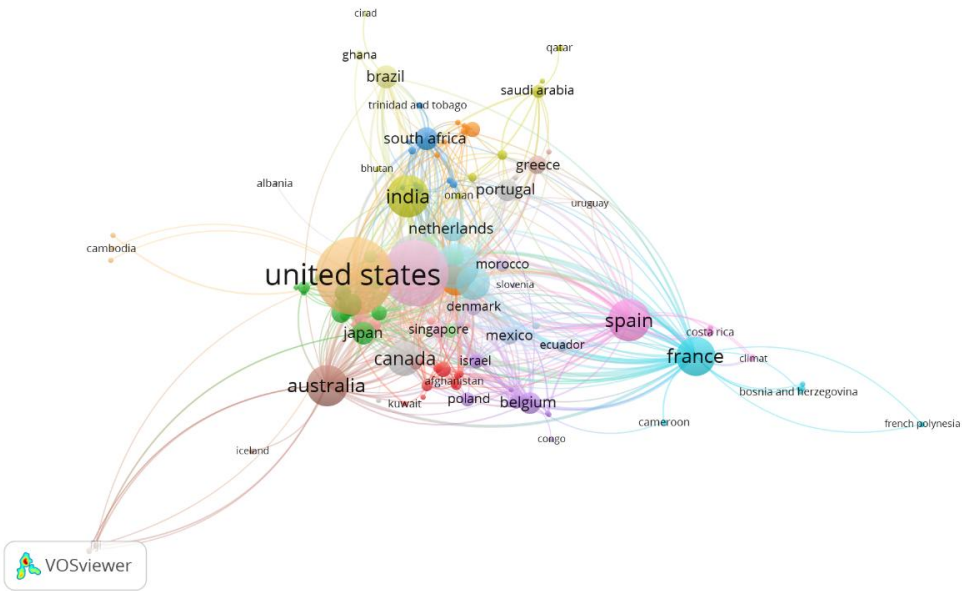


Figure 3. Country Visualization
Source: Data Analysis, 2026

The country-level network shows that the United States occupies the most central position in the global collaboration structure, as evidenced by the largest node size and the greatest number of strong connections to other countries. Such centrality reflects the leading role of U.S.-based institutions in producing and disseminating community resilience knowledge, while France and Spain emerge as secondary but substantial hubs, each maintaining extensive collaborative ties across multiple regions.

A distinct yellow-green cluster anchored by India, Brazil, South Africa, and Saudi Arabia, together with smaller nodes such as Ghana, Portugal, the Netherlands, and Bhutan, points to a robust collaboration structure connecting the United States with countries across the Global South, reflecting the strong relevance of community resilience research to climate and disaster vulnerable regions. Additional clusters, including Canada, Israel, Poland, Belgium, and Japan, together with a Southern Hemisphere grouping of Australia and Iceland, further demonstrate that community resilience research is a genuinely international undertaking spanning both developed and developing economies. It is also worth noting the presence of a wide periphery of smaller, yet still-connected, countries among them Denmark, Mexico, Singapore, Morocco, Greece, Slovenia, Oman, Uruguay, Qatar, Ecuador, Costa Rica, Bosnia and Herzegovina, French Polynesia, Cameroon, Congo, Kuwait, Afghanistan, Trinidad and Tobago, Albania, and Cambodia which, although individually small in publication volume, collectively broaden the geographic footprint of the field and confirm that community resilience research resonates well beyond its principal hubs.

b. Citation Analysis

The following table presents the most cited publications in the broader literature connected to community resilience res.

Table 1. Most Cited Article

Citations	Author and Year	Title	Publication
2359	(Whitmee et al., 2015)	Safeguarding human health in the Anthropocene epoch: Report of the Rockefeller Foundation-Lancet Commission on planetary health	The Lancet

Citations	Author and Year	Title	Publication
797	(Li et al., 2019)	Why some rural areas decline while some others not: An overview of rural evolution in the world	Journal of Rural Studies
781	(Folke, 2016)	Resilience (Republished)	Ecology and Society
718	(Oro et al., 2013)	Ecological and evolutionary implications of food subsidies from humans	Ecology Letters
691	(Fisher-Owens et al., 2007)	Influences on children's oral health: A conceptual model	Pediatrics
568	(Schell et al., 2020)	The ecological and evolutionary consequences of systemic racism in urban environments	Science
524	(Mosca et al., 2016)	Gut microbiota diversity and human diseases: Should we reintroduce key predators in our ecosystem?	Frontiers in Microbiology
507	(Kiers et al., 2010)	Mutualisms in a changing world: An evolutionary perspective	Ecology Letters
406	(Cretney, 2014)	Resilience for whom? Emerging critical geographies of socio-ecological resilience	Geography Compass
403	(Vacher et al., 2016)	The Phyllosphere: Microbial Jungle at the Plant-Climate Interface	Annual Review of Ecology, Evolution, and Systematics

Source: Scopus, 2026

The citation landscape is highly concentrated around a small number of foundational works. The most cited contribution, "Safeguarding human health in the Anthropocene epoch" (Whitmee et al., 2015), reflects its central role in linking environmental change directly to human health and community well-being, providing the cross-disciplinary conceptual vocabulary on which much of the subsequent resilience literature builds. The second most cited work extends this conceptual foundation into rural sociology by examining the demographic and economic drivers of rural area decline (Li et al., 2019), reinforcing resilience as a mechanism of socio-economic adaptation rather than a purely ecological category. Several highly cited studies demonstrate the breadth of the field beyond its conceptual core, including foundational ecological-resilience theorizing on adaptive capacity and novelty (Folke, 2016), evolutionary-ecological research on food subsidies and human-wildlife interactions (Oro et al., 2013), public-health-oriented work on children's oral health (Fisher-Owens et al., 2007), and urban-environmental-justice scholarship situating ecological and evolutionary processes within systemic racism (Schell et al., 2020). The presence of microbiome-oriented (Mosca et al., 2016) and mutualism-oriented (Kiers et al., 2010) perspectives among the most cited works further confirms that community resilience functions as an integrative concept linking ecology, public health, and social science, while critical-geography-oriented (Cretney, 2014) and plant-microbial-ecology-oriented (Vacher et al., 2016) contributions illustrate the concept's diffusion into adjacent biological and critical-theoretical domains.

c. Keyword Co-Occurrence Analysis

The following figure presents a VOSviewer keyword co-occurrence network illustrating the thematic structure and intellectual relationships in the global literature on community resilience.

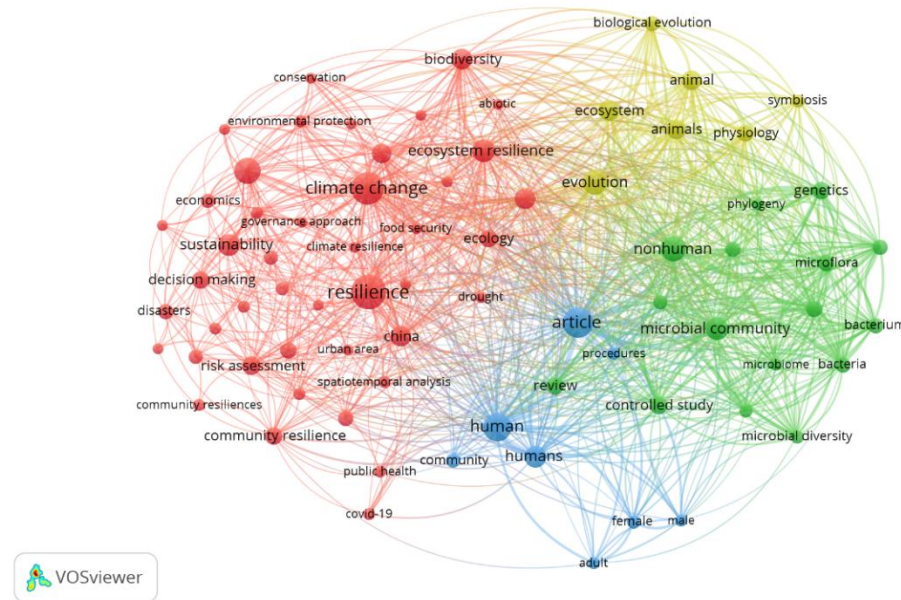


Figure 4. Network Visualization

Source: Data Analysis, 2026

As shown in the network, the visualization displays a densely interconnected knowledge structure organized into four distinct thematic clusters, with resilience and climate change occupying the most prominent positions as the field's primary conceptual anchors. The red cluster, the largest and most densely connected component of the network, encompasses climate change, resilience, ecosystem resilience, sustainability, decision making, disasters, risk assessment, community resilience, community resiliences, climate resilience, biodiversity, conservation, environmental protection, governance approach, food security, ecology, drought, china, urban area, spatiotemporal analysis, public health, and covid-19. This cluster represents the socio-ecological and policy-oriented dimension of the field, capturing research on how communities and institutions assess climate-related risk and pursue sustainable development pathways under environmental and public-health stress.

The yellow cluster, positioned toward the upper-right of the network, groups together biological evolution, animal, ecosystem, animals, abiotic, physiology, symbiosis, and evolution, reflecting the enduring influence of ecological theorizing on how organisms and ecosystems adapt to environmental change, a dimension consistent with the paleoecological resilience research identified in the co-authorship network. The blue cluster, positioned at the bottom-center of the network, encompasses article, human, humans, review, procedures, community, female, male, and adult, reflecting the substantial body of human-subject and public-health-oriented resilience research.

The green cluster, positioned on the right side of the network, encompasses nonhuman, microbial community, genetics, phylogeny, microflora, bacterium, bacteria, microbiome, microbial diversity, and controlled study, reflecting a distinct and rapidly growing research stream applying the resilience concept to microbial ecosystems.

The following figure shows an overlay of keywords used in studying community resilience using VOSviewer, wherein the nodes are colored according to the temporal evolution of themes from earlier years (purple-blue, around 2020) to more recent years (yellow, around 2024).

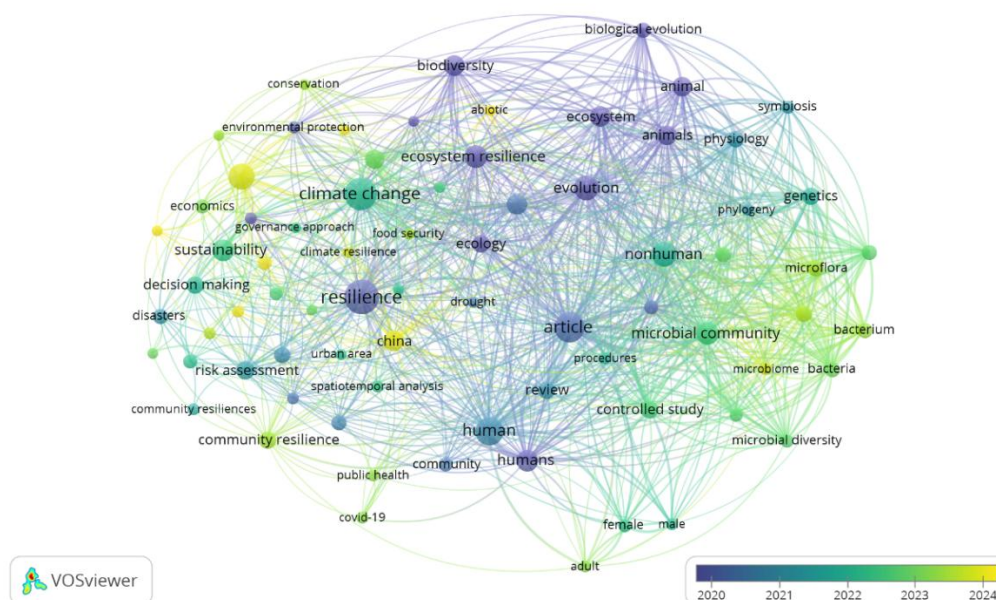


Figure 5. Overlay Visualization

Source: Data Analysis, 2026

The temporal distribution of the keyword network indicates that the earliest phase of research, represented by nodes in dark purple and blue, is concentrated around a set of foundational ecological and biological themes, including biological evolution, biodiversity, animal, animals, ecosystem, symbiosis, physiology, abiotic, evolution, and ecology, together with the human-subject terms human, humans, community, review, and procedures. This pattern suggests that scholarship from this period conceptualized resilience primarily through established biological and human-subject frameworks, situated within the field's original ecological and evolutionary foundations rather than within explicitly climate- or governance-oriented framings.

A subsequent phase, denoted by teal and blue-green nodes, encompasses resilience, ecosystem resilience, climate resilience, food security, drought, urban area, spatiotemporal analysis, risk assessment, disasters, nonhuman, genetics, phylogeny, and the demographic terms female, male, and adult. This shift reflects a growing thematic maturity in the field, in which resilience comes to be understood not merely as an ecological property but as a construct actively examined through spatial analysis, risk assessment, and demographic characterization, alongside an early extension of the concept into microbial and genetic domains. The presence of genetics and phylogeny within this intermediate cluster further suggests a methodological broadening, marking the initial incorporation of molecular and taxonomic approaches into a field that had previously relied predominantly on ecological and social-scientific methods.

The most recent phase, indicated by green-to-yellow nodes, is characterized by a pronounced concentration around climate change, sustainability, economics, governance approach, China, and environmental protection, alongside a cluster of microbial-ecosystem terms comprising microflora, bacterium, bacteria, and microbiome. Covid-19 and public health likewise fall within this most recent temporal band. This development indicates that contemporary research increasingly situates community resilience within climate governance and policy-oriented framings, while simultaneously extending the concept into microbial ecosystem dynamics and pandemic-related public-health disruption. Notably, resilience and climate change remain the dominant nodes throughout all temporal stages of the network, confirming their continued function as the field's central organizing constructs even as the

surrounding thematic structure expands toward increasingly climate-linked, microbial, and policy-oriented domains.

The following figure presents a VOSviewer density visualization (heatmap) of keyword co-occurrence in the global research landscape of community resilience, where brighter regions indicate higher term density and stronger conceptual concentration.

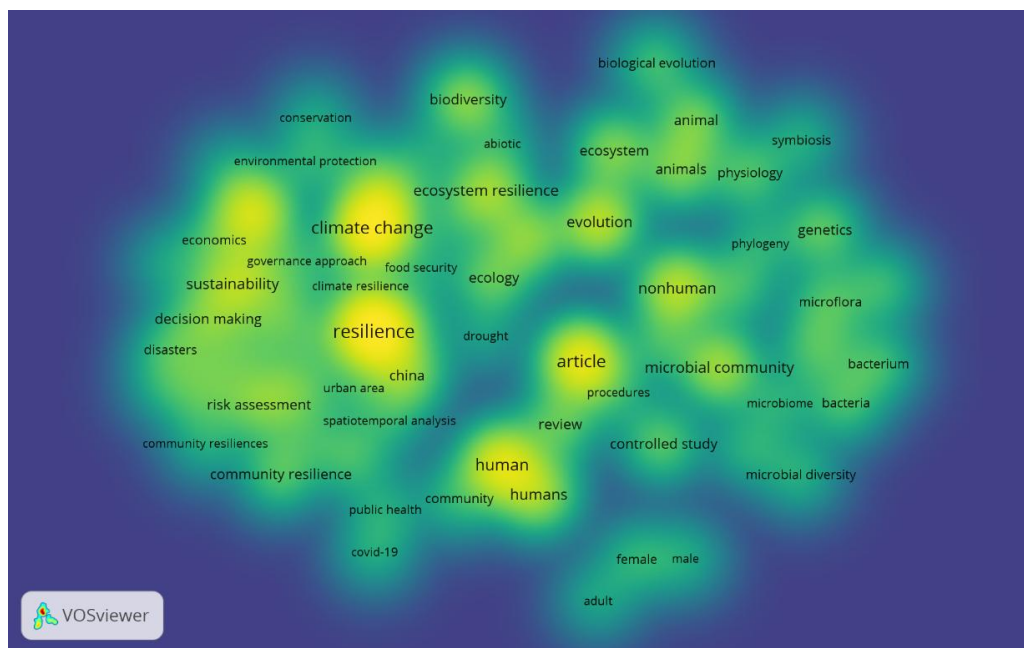


Figure 6. Network Visualization
Source: Data Analysis, 2026

The density visualization reveals a clearly defined intellectual core surrounded by a comparatively diffuse periphery. Climate change and resilience emerge as the brightest and most centrally positioned hotspots in the map, indicating that these two constructs function as the primary point of conceptual integration across the various strands of community resilience research. Surrounding this core, terms such as ecosystem resilience, biodiversity, article, and human likewise display high density, suggesting that these concepts constitute the theoretical and empirical backbone of the field.

A secondary band of moderately dense terms including sustainability, decision making, risk assessment, community resilience, governance approach, china, urban area, spatiotemporal analysis, evolution, nonhuman, and microbial community surrounds this core, indicating that these themes represent well-developed but comparatively secondary lines of inquiry within the broader research landscape.

By contrast, terms located toward the periphery of the map, including genetics, phylogeny, microflora, bacterium, bacteria, microbiome, microbial diversity, symbiosis, physiology, biological evolution, covid-19, public health, and the demographic terms female, male, and adult, exhibit noticeably lower density. This pattern indicates that such themes represent emerging or more specialized directions of inquiry rather than well-established components of the field's core structure. The relative distance of these peripheral terms from the central hotspot reflects a degree of thematic specialization, through which community resilience research extends into more focused domains such as microbial ecology, genetics, and demographic-oriented public health, while its conceptual foundation remains firmly anchored in the central cluster formed by climate change, resilience, and ecosystem resilience.

3.2 Discussion

This bibliometric analysis offers a systematic account of the collaborative structure, intellectual development, and thematic composition of community resilience research within contemporary science. Overall, the results indicate that knowledge production in this field is organized around small, tightly bound research teams rather than a single, broadly integrated global community, with the United States, France, and Spain functioning as the principal nodes of international collaboration. This pattern is broadly consistent with bibliometric studies of other rapidly growing scientific fields, where a handful of central actors and institutions disproportionately shape the research agenda while broader international participation continues to expand.

In terms of conceptual content, the keyword co-occurrence analysis shows that community resilience remains firmly embedded within socio-ecological and governance-oriented theoretical structures, particularly through its close association with climate change, ecosystem resilience, sustainability, and disaster risk assessment. These themes form the conceptual backbone of the field, tracing back to foundational treatments of resilience as an ecological and evolutionary construct. At the same time, the presence of strong linkages to governance, public-health, and microbial dimensions indicates an emerging paradigm shift, in which community resilience is increasingly understood not solely as a static ecological property, but also as something actively shaped by governance mechanisms and biological processes.

The overlay and density maps jointly establish a discernible temporal trajectory in the field's intellectual development. Early and well-established scholarship concentrated on foundational, ecological- and evolution-centered dimensions of resilience, particularly in relation to ecosystem stability and biological adaptation. Research at an intermediate stage increasingly incorporated resilience into broader discussions of sustainability and disaster risk, reflecting a shift toward understanding resilience as a governed and systemically managed phenomenon. More recent scholarship has diversified further into climate and public-health territory, encompassing climate change, disaster governance, and microbial ecosystem resilience, indicating that the field is progressively engaging with the governance mechanisms and biological processes through which communities anticipate, absorb, and recover from compounding environmental and public-health disturbances.

The citation analysis adds a further dimension by identifying the specific contributions that have most significantly shaped the intellectual trajectory of community resilience research. The dominance of a small set of foundational works reflects the field's continued reliance on cross-disciplinary and critical theoretical foundations, while the strong presence of evolutionary-ecology and microbiome-related studies among the top-cited works confirms that the field's biological roots remain highly influential. This pattern suggests that theoretical authority in the field remains concentrated around a small set of cross-disciplinary and biologically grounded contributions rather than being broadly distributed. This points toward future research that more deliberately strengthens cross-institutional and cross-country collaboration, particularly by connecting the paleoecological and microbial resilience research communities with the rapidly growing climate governance and disaster risk literature.

4. CONCLUSION

This study offers a comprehensive bibliometric mapping of the global research network on community resilience by employing the Scopus database and VOSviewer techniques. As shown by the co-authorship, institutional, and country analyses, the field is driven by a small number of tightly bound research teams and a globally distributed but United States-, France-, and Spain-centered collaboration network, with growing participation from countries such as India, Brazil,

and South Africa. The keyword co-occurrence, overlay, and density analyses confirm that climate change, resilience, ecosystem resilience, sustainability, and disaster risk assessment form the intellectual core of the field, while microbial community resilience and public-health-oriented resilience research constitute significant and expanding secondary pillars. The citation analysis further demonstrates that the field's theoretical foundations remain firmly cross-disciplinary, spanning planetary health, ecological resilience theory, and evolutionary ecology. Taken together, these findings indicate that community resilience research has developed into a mature, globally engaged, and increasingly interdisciplinary field, with clear potential for future growth at the intersection of climate governance, biological resilience mechanisms, and international scientific collaboration.

REFERENCES

- Allen, C. R., & Holling, C. S. (2010). Novelty, adaptive capacity, and resilience. *Ecology and Society*, 15(3), Article 24. <https://doi.org/10.5751/ES-03720-150324>
- Bankoff, G. (2007). Dangers to going it alone: Social capital and the origins of community resilience in the Philippines. *Continuity and Change*, 22(2), 327–355. <https://doi.org/10.1017/S0268416007006315>
- Cretney, R. (2014). Resilience for whom? Emerging critical geographies of socio-ecological resilience. *Geography Compass*, 8(9), 627–640. <https://doi.org/10.1111/gec3.12154>
- Fekete, A., Hufschmidt, G., & Kruse, S. (2014). Benefits and challenges of resilience and vulnerability for disaster risk management. *International Journal of Disaster Risk Science*, 5(1), 3–20. <https://doi.org/10.1007/s13753-014-0008-3>
- Fisher-Owens, S. A., Gansky, S. A., Platt, L. J., Weintraub, J. A., Soobader, M.-J., Bramlett, M. D., & Newacheck, P. W. (2007). Influences on children's oral health: A conceptual model. *Pediatrics*, 120(3), e510–e520. <https://doi.org/10.1542/peds.2006-3084>
- Folke, C. (2016). Resilience. *Ecology and Society*, 21(4), 44. <https://doi.org/10.5751/ES-09088-210444>
- Graveline, M.-H., & Germain, D. (2022). Disaster risk resilience: Conceptual evolution, key issues, and opportunities. *International Journal of Disaster Risk Science*, 13(3), 330–341. <https://doi.org/10.1007/s13753-022-00419-0>
- Jovanovska, E., Cvetkoska, A., Hauffe, T., Levkov, Z., Wagner, B., Sulpizio, R., Francke, A., Albrecht, C., & Wilke, T. (2016). Differential resilience of ancient sister lakes Ohrid and Prespa to environmental disturbances during the Late Pleistocene. *Biogeosciences*, 13(4), 1149–1161. <https://doi.org/10.5194/bg-13-1149-2016>
- Kiers, E. T., Palmer, T. M., Ives, A. R., Bruno, J. F., & Bronstein, J. L. (2010). Mutualisms in a changing world: An evolutionary perspective. *Ecology Letters*, 13(12), 1459–1474. <https://doi.org/10.1111/j.1461-0248.2010.01538.x>
- Lei, Y., Wang, J., Yue, Y., Zhou, H., & Yin, W. (2014). Rethinking the relationships of vulnerability, resilience, and adaptation from a disaster risk perspective. *Natural Hazards*, 70(1), 609–627. <https://doi.org/10.1007/s11069-013-0831-7>
- Li, Y., Westlund, H., & Liu, Y. (2019). Why some rural areas decline while some others not: An overview of rural evolution in the world. *Journal of Rural Studies*, 68, 135–143. <https://doi.org/10.1016/j.jrurstud.2019.03.003>
- Mosca, A., Leclerc, M., & Hugot, J. P. (2016). Gut microbiota diversity and human diseases: Should we reintroduce key predators in our ecosystem? *Frontiers in Microbiology*, 7, Article 455. <https://doi.org/10.3389/fmicb.2016.00455>
- Oro, D., Genovart, M., Tavecchia, G., Fowler, M. S., & Martínez-Abraín, A. (2013). Ecological and evolutionary implications of food subsidies from humans. *Ecology Letters*, 16(12), 1501–1514. <https://doi.org/10.1111/ele.12187>
- Panagiotopoulos, K., Holtvoeth, J., Kouli, K., Marinova, E., Francke, A., Cvetkoska, A., Jovanovska, E., Lacey, J. H., Lyons, E. T., Buckel, C., Bertini, A., Donders, T., Just, J., Leicher, N., Leng, M. J., Melles, M., Pancost, R. D., Sadori, L., Tauber, P., ... Wilke, T. (2020). Insights into the

- evolution of the young Lake Ohrid ecosystem and vegetation succession from a southern European refugium during the Early Pleistocene. *Quaternary Science Reviews*, 227, Article 106044. <https://doi.org/10.1016/j.quascirev.2019.106044>
- Schell, C. J., Dyson, K., Fuentes, T. L., Roches, S. D., Harris, N. C., Miller, D. S., Woelfle-Erskine, C. A., & Lambert, M. R. (2020). The ecological and evolutionary consequences of systemic racism in urban environments. *Science*, 369(6509), eaay4497. <https://doi.org/10.1126/science.aay4497>
- Vacher, C., Hampe, A., Porté, A. J., Sauer, U., Compant, S., & Morris, C. E. (2016). The phyllosphere: Microbial jungle at the plant-climate interface. *Annual Review of Ecology, Evolution, and Systematics*, 47, 1–24. <https://doi.org/10.1146/annurev-ecolsys-121415-032238>
- Whitmee, S., Haines, A., Beyrer, C., Boltz, F., Capon, A. G., De Souza Dias, B. F., Ezeh, A., Frumkin, H., Gong, P., Head, P., Horton, R., Mace, G. M., Marten, R., Myers, S. S., Nishtar, S., Osofsky, S. A., Pattanayak, S. K., Pongsiri, M. J., Romanelli, C., ... Yach, D. (2015). Safeguarding human health in the Anthropocene epoch: Report of the Rockefeller Foundation-Lancet Commission on planetary health. *The Lancet*, 386(10007), 1973–2028. [https://doi.org/10.1016/S0140-6736\(15\)60901-1](https://doi.org/10.1016/S0140-6736(15)60901-1)
- Yang, Q., Yang, D., Li, P., Liang, S., & Zhang, Z. (2021). A bibliometric and visual analysis of global community resilience research. *International Journal of Environmental Research and Public Health*, 18(20), Article 10857. <https://doi.org/10.3390/ijerph182010857>
- Zhang, Y., Cai, X., Fry, C. V, Wu, M., & Wagner, C. S. (2021). Topic evolution, disruption and resilience in early COVID-19 research. *Scientometrics*, 126(5), 4225–4253. <https://doi.org/10.1007/s11192-021-03946-7>