



Research article

Mapping the animal welfare research in Southeast Asia: A bibliometric analysis (1987–2025)

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Abstract

Animal welfare has emerged as a significant scientific and ethical concern in Southeast Asia, where biodiversity, culture and agricultural systems create unique challenges and opportunities. This study presents a bibliometric analysis of SCOPUS-indexed publications (1987–2025) to map research trends, productive contributors, leading institutions and countries, and thematic priorities in the region. A systematic search identified 298 relevant documents, analyzed using the Bibliometrix package (R, Bibioshiny) and VOSviewer for network visualization. Results show an annual growth rate of 8.60%, with most outputs being journal articles, prominently published in *Animals*. Thailand is the leading hub, driven by Chiang Mai University and extensive collaborations with the United Kingdom, the United States, and Australia. Authorship patterns follow Lotka's law, with a small cohort of prolific researchers and a broad base of occasional contributors. Thematic mapping reveals two dominant areas: region-specific concerns on Asian elephant and livestock welfare, and wider issues on wildlife trade, tourism impacts, and welfare assessment. Species analysis identifies two major research clusters: livestock/elephants and primates/insects, reflecting both agricultural and wildlife-related priorities. Overall, animal welfare research in Southeast Asia is expanding in number, thematic diversity, and global integration. Strengthening regional capacity, fostering interdisciplinary collaboration, and embedding local context into global welfare frameworks will be critical for sustaining growth and addressing both foundational and emerging challenges in animal welfare.

Keywords: Animal welfare, Asian elephant, Bibliometric analysis, Collaboration networks, Livestock welfare, Thematic mapping, Southeast Asia.

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INTRODUCTION

Animal welfare has become a prominent subject of scientific inquiry and public concern worldwide, reflecting the increased recognition of the ethical, environmental and economic implications of how animals are treated across various sectors (Fraser, 2008). The Southeast Asian region is rich in biodiversity, characterized by diverse cultural, economic, and agricultural practices, and presents unique challenges and opportunities in advancing animal welfare standards, requiring a region-specific approach with local context consideration (Garcia and McGlone, 2022). The relationship between traditional animal use, wildlife conservation, agricultural intensification and emerging tourism activities requires a comprehensive understanding of regional research trends and priorities.

The Southeast Asian region has a number of reported animal welfare issues which involve livestock, wildlife, companion animals, laboratory animals and zoo animals. Sinclair and Phillips (2019) reported that in Vietnam, Malaysia and Thailand, farming and slaughtering of livestock face a number of welfare issues. These include the lack of provision of good quality food, water, and shelter for livestock, as well as poor handling, disease and injury management. There is also an issue with not allowing livestock to exhibit their natural behaviors. The inclusion of livestock in national disaster plans and during relief operations is also lacking (Gongal and Ofrin, 2020). In general, there are welfare issues on malnutrition, overstocking, poor disease management, incorrect slaughter procedures, poor handling and transport (Rahman et al., 2005; Nizamuddin and Rahman, 2019). Stray animal welfare is another welfare issue that needs to be addressed in the region. Stray animals can transmit zoonotic diseases (Garde et al., 2013; Gompper, 2013), and cause road accidents and injuries (Jackman and Rowan, 2007). Another concern relating to dogs and cats in Asia is their use in the meat trade as this practice is related to the spread of rabies (Four Paws, 2020). In the case of zoo animals, Agoramoorthy (2004) explored the welfare concerns surrounding nonhuman primates employed in entertainment across various countries in Southeast Asia. Activities ranged from engaging nonhuman primates in entertaining tourists to being used in movies. Warwick et al. (2023) revealed that elephant tourism was associated with zoonotic diseases and several areas of animal welfare concern. Compared to Western countries, in Southeast Asia there are common and distinct welfare issues. In both regions, several animal species are raised for specific purposes, including entertainment. However, higher-income countries have well-implemented animal welfare policies, practices, and strategies that are communicated effectively to consumers, who are well-informed about animal welfare and have purchasing options that reflect their values. (Rahman et al., 2005; Parlasca et al., 2023). The involvement of a broad range of stakeholders in policy-making and implementation needs to be improved across Southeast Asia.

Animal welfare research in Southeast Asia has only recently gained significant traction, propelled by the increasing involvement of over 30 non-governmental organizations (NGOs) and more than 15 national and international funding agencies. These organizations play essential roles in promoting and protecting animal welfare in the region (World Organisation for Animal Health, 2025; World Animal Net, 2025). These collaborations have supported studies on livestock welfare, wildlife conservation, companion animals, and the socio-economic factors influencing animal care.

While tradition has coexisted with modern, intensive farming for decades, a growing awareness of animal suffering and sentience has driven new research and policy initiatives across the region. One main focus is on farm animal welfare, which is essential considering the increased livestock production in many Southeast Asian countries (Sinclair and Phillips, 2019). Studies in this area often explore the attitudes of farmers and industry supervisors, which is essential for developing effective strategies to improve production systems. The second important aspect that is taken into consideration is the welfare of animals used in scientific research,

resulting in the adoption of guidelines based on the 3Rs (replacement, reduction and refinement) to ensure the implementation of ethical procedures (Retnam et al., 2016).

Furthermore, research is also addressing the welfare of companion and working animals, as well as the management of wildlife. The studies include investigations on the incidence of rabies and the control of free-roaming dog populations, a major public health and welfare issue in countries such as Vietnam, Indonesia, and the Philippines (Lee et al., 2024). There is also a concern about the welfare of animals in captivity, such as zoos, and the ethical management of animals confiscated from the illegal wildlife trade (Melfi, 2009; Tallo-Parra et al., 2023; World Animal Protection, n.d.). The World Organisation for Animal Health (WOAH) provides the framework for these efforts through its Regional Animal Welfare Strategy, which guides countries in developing standards for issues such as humane slaughter and transport (WOAH, 2008). Research provides an essential foundation for creating evidence-based policies and practices that promote animal welfare while being sensitive to the region's distinct cultural and economic realities.

Bibliometric analysis serves as an essential tool to achieve a quantitative overview of the scientific output, identify productive contributors, and assess the evolving research themes within the field of interest (Donthu et al., 2021). Conducting a bibliometric analysis of publications related to animal welfare in Southeast Asia will facilitate the possibility of identifying species focus, productive authors and affiliations, and thematic interest. These essential pieces of information help identify research gaps, which can serve as a roadmap for future research endeavors.

This study aimed to complete an extensive bibliometric analysis of animal welfare research in Southeast Asia by examining publication trends, species-specific focuses, key thematic areas, and emerging research directions in the field.

MATERIALS AND METHODS

To thoroughly map the animal welfare research conducted in Southeast Asia, several crucial steps were taken. These included compiling relevant published original research articles through a database search based on established inclusion and exclusion criteria, and conducting systematic bibliometric analysis through data visualization and interpretation.

Compilation of relevant published articles

A systematic database search of Scopus-indexed research articles was employed to gather relevant published materials. The search attributes were defined as inclusion and exclusion criteria to identify and include only relevant documents on animal welfare for the bibliometric analysis (Table 1).

Table 1 Inclusion and exclusion criteria used in data mining.

Criteria	Description
Database	Scopus
Search query	("animal welfare" OR "animal protection" OR "animal ethics") AND ("Southeast Asia" OR "ASEAN" OR "Cambodia" OR "Indonesia" OR "Laos" OR "Malaysia" OR "Myanmar" OR "Philippines" OR "Singapore" OR "Thailand" OR "Timor Leste" OR "Vietnam" OR "Brunei")
Search category	Article title, abstract, keywords
Time frame	Since the first article published in Scopus to present
Document type	Original research articles, conference papers, notes, reviews
Language	English
Publication stage	Final

Bibliometric analysis

The data analysis was performed using the R software (RStudio Team), utilizing the Biblioshiny web-based graphical interface provided by the Bibliometrix package (Aria and Cuccurullo, 2017). Biblioshiny provides descriptive information on the bibliometric data, including the quantity of publications per year, leading authors and their production over time, leading affiliations and countries, preferred journals, most common keywords, word cloud, thematic map, networks on co-occurrence, collaborations and country, as well as three field plots which plot the relationship between keywords from article titles, contributing authors, and country of affiliation. The productivity of authors was evaluated according to Lotka's Law which describes the relationship between the number of authors and the number of papers produced. The law states that only a few authors contribute most publications while many authors produce only a few publications. On the one hand, evaluation on the preferred journal was assessed using Bradford's Law which states that scientific literature about a particular topic is distributed across journals in a predictable pattern. More articles are published in a few core journals, while a large group of journals have fewer articles published. This law serves as a guide to researchers to identify key journals for literature searches and resource allocation.

The data on the most relevant authors and authors' affiliations were limited to Southeast Asian countries. The most frequently used keywords were identified by analyzing all keywords present in the titles and abstracts of the published articles gathered. Bigram criteria were employed to identify the top ten most frequently occurring two-word phrases in the titles.

The thematic map provides a strategic overview of the structure and research focus of published articles in Southeast Asia. The map plots keywords based on their relevance degree (centrality), measuring how interconnected the theme is with others, and development degree (density), indicating how well-developed and focused a theme is. There are four quadrants which give information on the maturity, importance and niche areas of research.

The VOSviewer software version 1.16.20 (Van Eck and Waltman, 2010) was used to create maps based on network bibliometric data. The VOSviewer maps allow visualization of bibliometric trends in keywords, co-authorship, co-occurrence, animal species or groups that are of interest to animal welfare research, and the average publications per year.

RESULTS

The descriptive bibliometric information refers to the 298 documents (245 journal articles, 14 conference papers, 14 notes, and 25 review) gathered from SCOPUS about animal welfare research in Southeast Asia, which were published from 1987 to 2025 with an annual publication growth rate of 8.60.% (Table 2).

Table 2 Bibliometric information of SCOPUS-indexed documents about animal welfare research in Southeast Asia from 1987 to 2025.

Description	Results
Timespan	1987-2025 (July)
Sources (Journals, Books, etc.)	149
Documents	298
Article	245
Conference paper	14
Note	14
Review	25
Annual growth rate, %	8.60
Document average age	6.48
Average citations per document	15.26
Keywords plus (ID)	2455
Author's keywords (DE)	3161
Authors	1060
Authors of single-author documents	35
Single-authored documents	42
Co-authors per document	4.56
International co-authorships, %	36.24

Quantity of Publications

Table 3 shows the number of publications per year on animal welfare research in Southeast Asia. It is noteworthy that the number of publications peaked in 2021, with 36 papers, followed by 2023, which had 34 papers. This average annual increase of 8.6% in the number of published articles indicates that animal welfare is indeed a growing concern within the scientific community.

Table 3 Scientific production of articles on animal welfare in Southeast Asia from 1987 to 2025.

Years	Number of articles
1987-1990	1
1991-1995	0
1996-2000	3
2001-2005	15
2006-2010	16
2011-2015	35
2016-2020	81
2021-2025	147

Leading Authors

The most relevant authors with at least five publications on animal welfare and their country affiliations are shown in Table 4. The most influential author is affiliated with Thailand and the USA. Remarkably, the majority of the most influential authors are coming from Southeast Asian countries, namely Thailand, Malaysia, and the Philippines. Furthermore, the majority of authors with the most publications related to animal welfare are from Thailand. Other Southeast Asian countries have published research on animal welfare, but the number is fewer than five.

Table 4 The most influential authors with country affiliation and the number of publications they have authored about animal welfare.

Authors	Country Affiliation	No. of Publications
Brown, Janine L.	Thailand; USA	14
Punyapornwithaya, Veerasak	Thailand	13
Thitaram, Chatchote	Thailand	13
Bansiddhi, Pakkanut	Thailand	12
Phillips, Clive Julian Christie	Australia	12
Sinclare, Michelle	Australia	12
Nekaris, K. A. I	United Kingdom	11
Khonmee, Jaruwan	Thailand	9
Nijman, Vincent	United Kingdom	9
Idrus, Zulkifli	Malaysia	8
Govindasamy, Agoramoorthy	Malaysia	6
D'Cruze, Neil C.	United Kingdom	6
MacDonald, David W.	United Kingdom	6
De Luna, Maria Catalina Tan	Philippines	5
Jitrajak, Tharadol	Thailand	5
Nganvongpanit, Korakot	Thailand	5
Ramanoon, Siti Zubaidah	Malaysia	5
Somgird, Chaleamchat	Thailand	5
Sripandon, Jesda	Thailand	5
Umpapol, Hanchai	Thailand	5

Figure 1 illustrates the temporal patterns of scholarly output on animal welfare in Southeast Asia among the top 14 authors, covering the period 2002 to 2024, it represents the productivity and citation impact of 14 authors whose work has contributed significantly to the development of this field. In 2002-2010, research outputs were limited to a few authors. Agoramoorthy Govindasamy published articles as early as 2002.

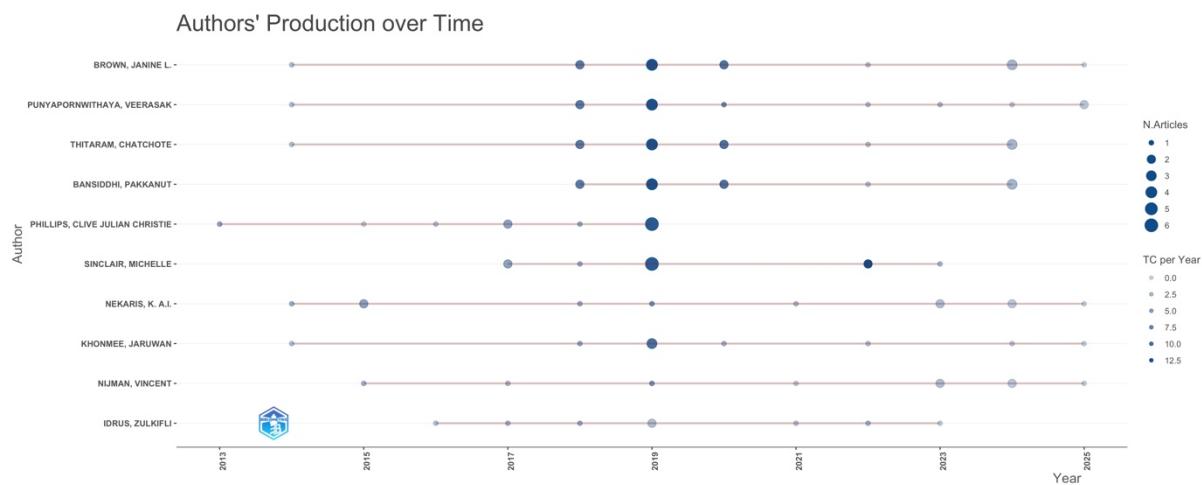


Figure 1 Authors' production over time. The dot size represents the number of articles published in a year, and the dot color represents total citations per year (lighter blue dots indicate fewer citations, while darker blue dots indicate a higher number of citations).

In 2014-2020, there was a marked increase in publication activity, an increase in the number of articles produced and authors who are engaged in animal welfare research. These authors include Clive Julian Christie Phillips, who published six articles in a single year with high citation counts; Pakkanut Bansiddhi, Veerasak Punyapornwithaya, Chatchote Thitaram, Michelle Sinclair, Vincent Nijman, K. A. I. Nekaris, Jaruwan Khonmee, and Zulkifli Idrus, who exhibited sustained productivity with multiple articles per year. In 2021, Janine L Brown, Michelle Sinclair and Jaruwan Khonmee remained active. The publications from the most recent years have fewer accumulated citations (lighter color tones), this is expected due to the limited time for citations to increase.

Author productivity in the field of animal welfare research in Southeast Asia was evaluated according to Lotka's law, which models the distribution of scientific productivity among authors. Approximately 80% of the authors contributed only one document, as evidenced by the prominent peak at a single document on the X-axis (Figure 2). Lotka's law states that as the number of documents increases, the percentage of authors declines, approaching 0% for authors with more than ten published documents. The observed data (solid line) closely resembles the expected distribution (dashed line), which means that author productivity in this field of research is consistent with Lotka's law.

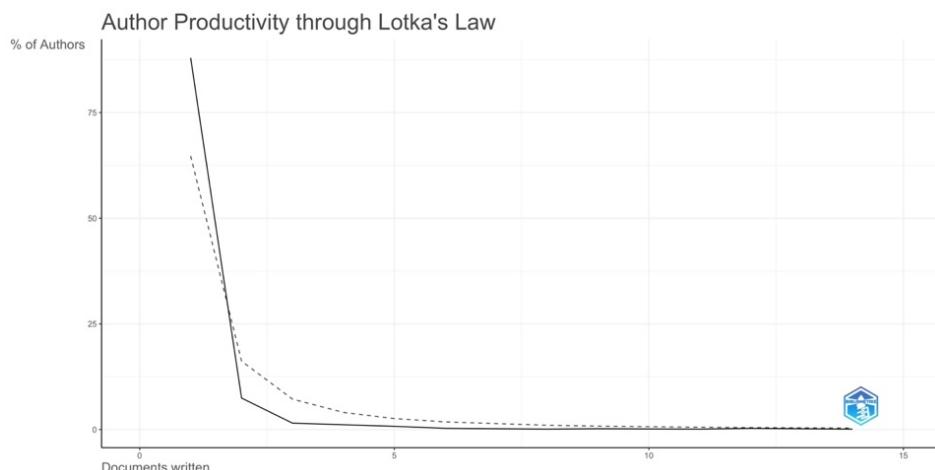


Figure 2 The productivity of authors in the field of animal welfare research in Southeast Asia was analyzed using Lotka's law. The solid line represents the observed distribution of author productivity, while the dashed line shows the theoretical distribution predicted by Lotka's law.

Leading Affiliations and Countries

Table 5 summarizes the publication outputs of the ten most productive institutions contributing to animal welfare research in Southeast Asia. The data highlight the distribution of research activity across universities in Southeast Asia and international institutions with strong research collaboration in the field of animal welfare. Chiang Mai University in Thailand is the most prolific institution with 101 publications, making the institution a prominent regional hub for animal welfare research. Other universities in Thailand also have a high number of publications, namely Chulalongkorn University, Kasetsart University and Sakon Nakhon Rajabhat University. Universiti Putra Malaysia and Universitas Udayana in Malaysia and Indonesia, respectively, were among the top prolific institutions in the region. Oxford Brookes University (UK), The University of Queensland (Australia),



University of Oxford (UK), and University of Sydney (Australia) are among the relevant institutions outside Southeast Asia that have emerged as significant contributors to the production of publications on animal welfare due to their strong research collaborations.

Table 5 Most relevant affiliations and the quantity of their publications.

Affiliation	Country	No. of Publications
Chiang Mai University	Thailand	101
Universiti Putra Malaysia	Malaysia	70
Oxford Brookes University	United Kingdom	47
The University of Queensland	Australia	46
Chulalongkorn University	Thailand	35
Kasetsart University	Thailand	25
Sakon Nakhon Rajabhat University	Thailand	24
University of Oxford	United Kingdom	20
The University of Sydney	Australia	18
Universitas Udayana	Indonesia	18

Figure 3 is a network visualization depicting international research partnerships, highlighting key contributing countries such as the United States, the United Kingdom, Thailand, Indonesia, and Malaysia. The connections indicate co-authorship and collaborative efforts, with cluster colors representing the year of publication.

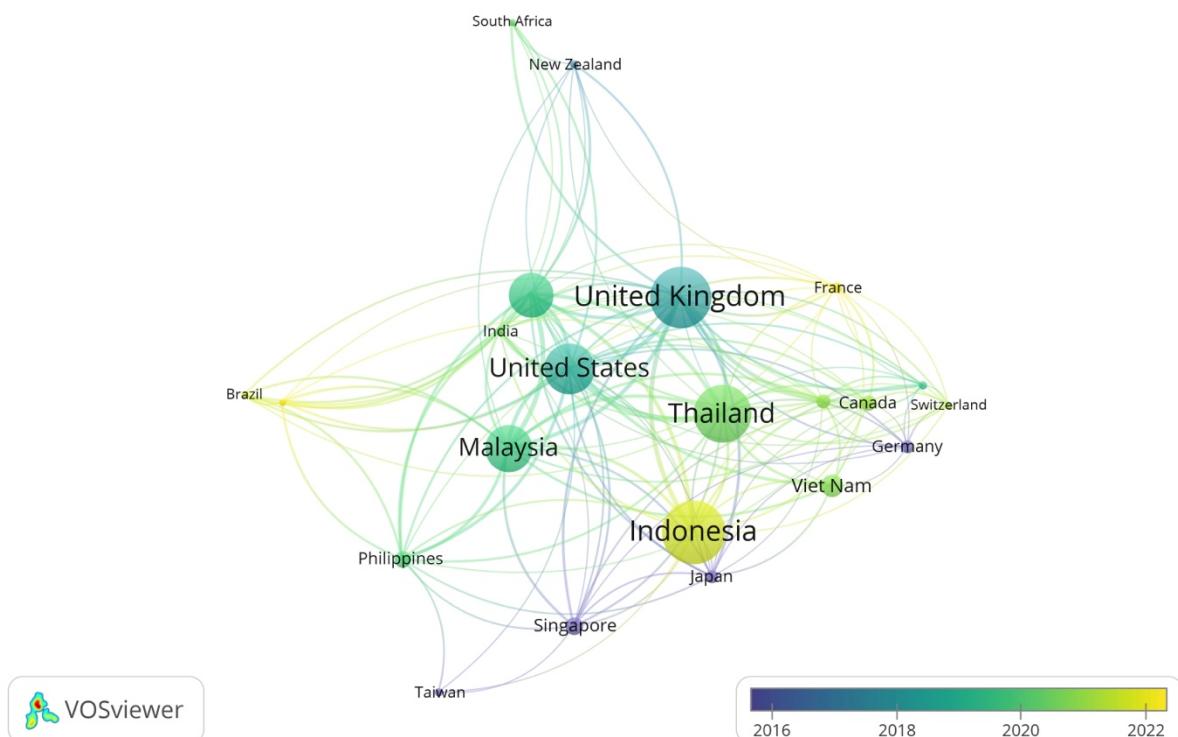


Figure 3 Network visualization of international collaboration in animal welfare research. The size of the node depicts the volume of publications from that country. The intensity of co-authorship is evident in the thickness and quantity of lines connecting nodes.

Thailand appears as a significant hub in Southeast Asia with multiple international collaborations, which are shown in the yellow cluster. The largest nodes with dark green color belong to the United States and the United Kingdom, indicating that they have been involved in animal welfare research for a longer period. Countries like Thailand, Malaysia, Indonesia, the Philippines, Brazil, and Pakistan are represented with green or yellow colors, indicating a recent increase in research on animal welfare.

Preferred Journals

The journal *Animals* stands out as the most relevant source with 25 publications on animal welfare (Figure 4a). *Journal of Applied Animal Welfare Science* and *PLOS ONE* followed with 13 publications. The inclusion of five publications in *IOP Conference Series: Earth and Environmental Science* demonstrates the role of academic conferences in disseminating research outputs.

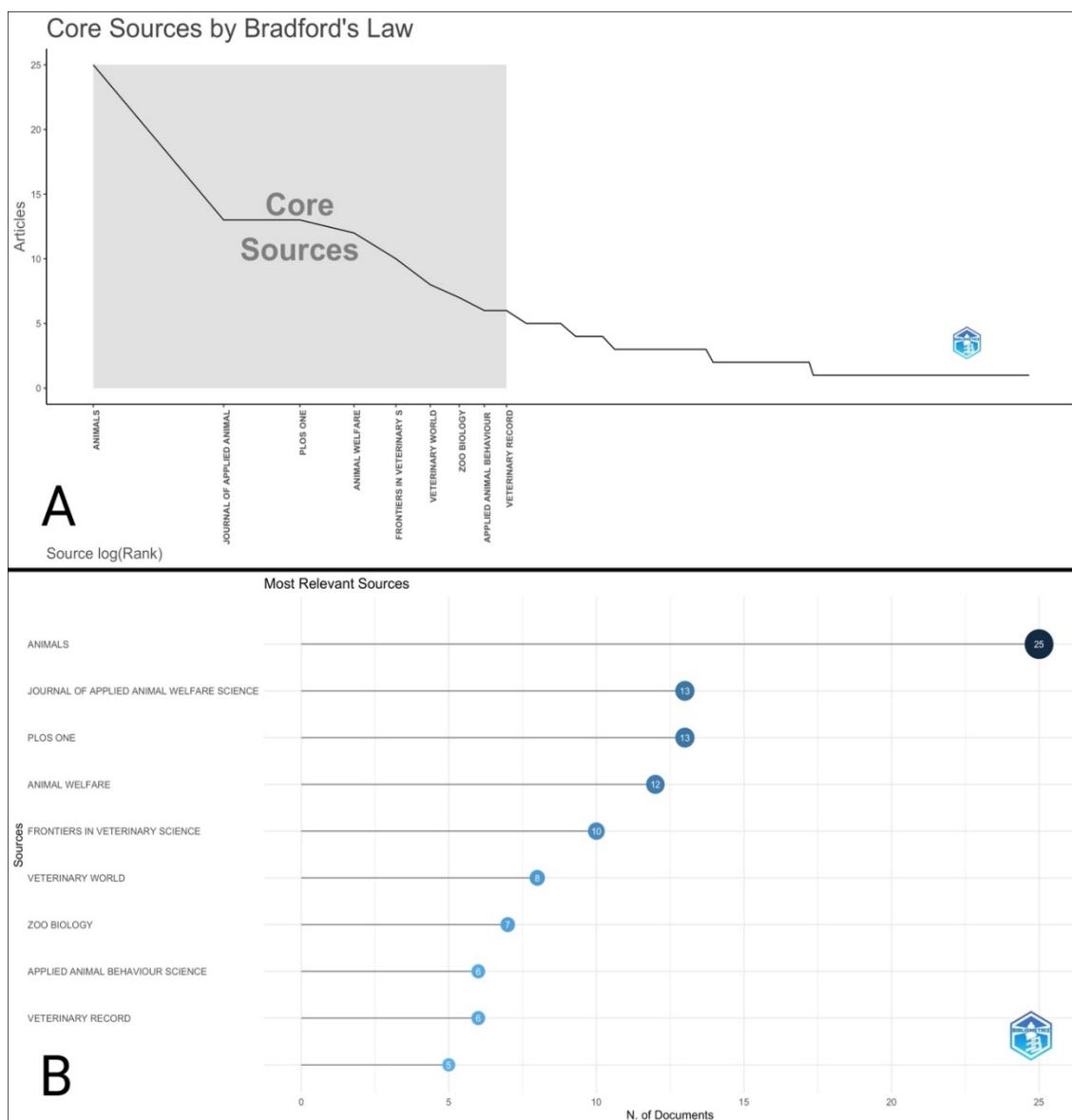


Figure 4 Most relevant sources of published documents on animal welfare in Southeast Asia (A). Core sources of published documents in animal welfare in Southeast Asia according to Bradford's law (B).

Figure 4b illustrates the core journals, which comprise a select group of journals that publish a substantial portion of the most frequently cited articles, as per Bradford's law. The core journals include *Animals*, *Journal of Applied Animal Welfare Science*, *PLOS ONE*, *Animal Welfare*, *Frontiers in Veterinary Science*, *Veterinary World*, *Zoo Biology*, *Applied Veterinary Behavior* and *Veterinary Record*.

Keywords in the Abstracts and Titles

The analysis of keywords from published articles on animal welfare in Southeast Asia provides an overview of the primary subject. Figure 5a shows the most frequent and relevant single words among published articles. The keyword "animal welfare" has 251 occurrences and is expected, given that it is the central theme of the analysis. The words "article", "nonhuman", "animal", "animals", "female", and "controlled study" were among the prominent keywords.



Figure 5 Authors' production over time. The dot size represents the number of articles published in a year, and the dot color represents total citations per year (lighter blue dots indicate fewer citations, while darker blue dots indicate a higher number of citations).

The analysis also includes a two-word search for the most frequent and relevant words appearing in titles of published articles. The prominent theme next to "animal welfare" is "elephant tourism," which is supported by the presence of bigram terms "Asian elephant" and "Asian elephants". The result also included "Southeast Asia", "Northern Thailand", "wildlife trade", "welfare assessment", and "welfare standards" (Figure 6b).

Thematic Map

Figure 6 demonstrates the thematic map of animal welfare research in Southeast Asia based on published articles indexed in Scopus. The motor themes (top-right quadrant) include the keywords "cattle", "production", "behavior", "trade", "animals", "wildlife", "assessing", "dairy" and "feeding", and are characterized by both high centrality and high density. The niche themes (top-left quadrant) highlight a highly specialized subfield of research on poultry welfare, particularly on specific methods like detection and assays. The basic themes (bottom-right quadrant) are highly central but have lower density. These are the foundational concepts that underpin the entire field. The emerging or declining themes (bottom-left quadrant) are those keywords with low centrality and low density, which means that these topics are emerging or declining.

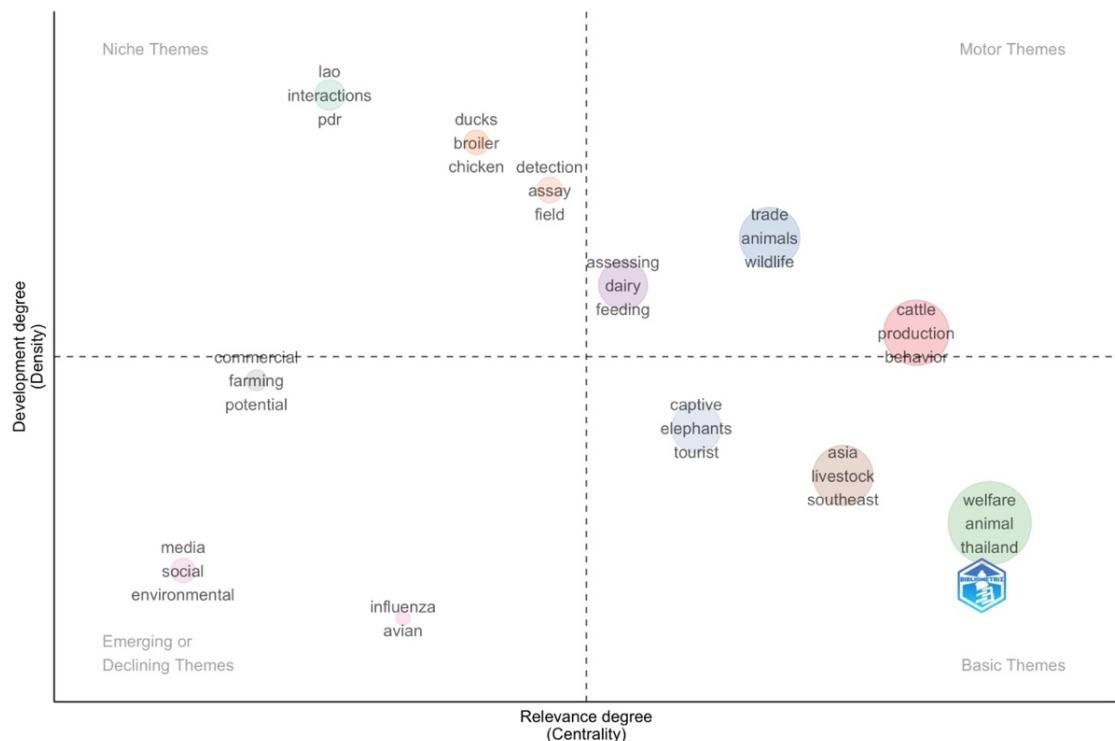


Figure 6 Thematic map of the main research themes in animal welfare in Southeast Asia

The use of VOSviewer allows for the network visualization of author keywords related to animal welfare research in Southeast Asia, with highlights on the thematic clusters and temporal trends in species focus (Figure 7). Node size reflects the frequency of keyword occurrence, while link thickness demonstrates the strength of co-occurrence relationships. The color gradient indicates the year of publication, ranging from 2014 (purple) to 2022 (yellow). Central themes include animal welfare, veterinary medicine, animal behavior, and geographic regions such as Thailand and Southeast Asia. Earlier research focused on broader topics like species conservation, primates, and zoo animals. However, more recent studies indicate a shift towards species that have direct human interaction, such as cattle, dogs, and elephants. Emerging trends also reflect increasing interest in topics like tourism, animal stress, and controlled studies in welfare contexts.

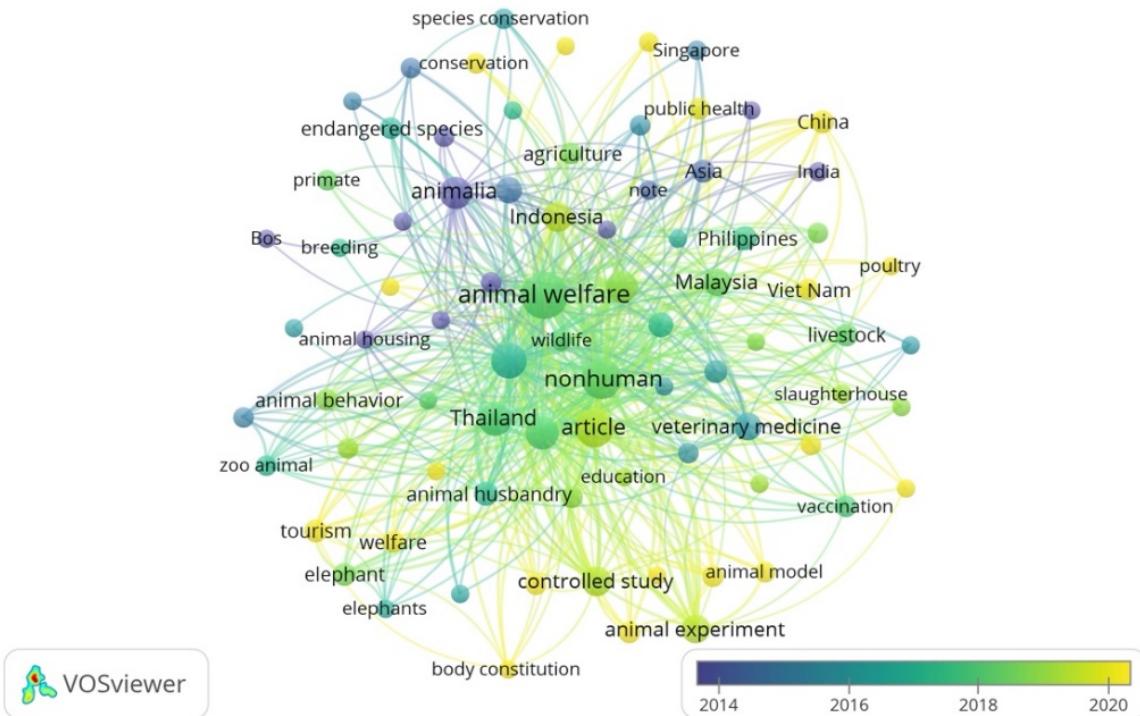


Figure 7 Network visualization of author keywords related to animal welfare research, highlighting thematic clusters and temporal trends in species focus

The three fields, which plot the relationship between keywords from article titles, contributing authors, and country of affiliation, are shown in Figure 8. The plot identifies Thailand as the most significant research hub with the widest bar in the country column and extensive connections to both the authors and keywords. The research themes most strongly associated with Thailand are “elephant”, “management”, “captive”, “tourism” and “welfare”.

Animals of Interest

The network visualization of animal species that are the focus of animal welfare research in Southeast Asia was carried out using the VOSviewer software (Figure 9). The network visualization shows distinct but interconnected clusters which include livestock and domestic animals (e.g., livestock, bovine, goat, pig, poultry) (Umpapol et al., 2011, 2014; Erian et al., 2019; Sadiq et al., 2020; Abubakar et al., 2021; de Luna et al., 2022; Hartcher et al., 2023; Nijman et al., 2023; Pirompud et al., 2023; Jainonthee et al., 2025a, 2025b; Rashid et al., 2025), wildlife and zoo animals (e.g., elephant, tiger, wild animal, zoo animal) (Agoramoorthy, 2002, 2002, 2004; Agoramoorthy and Hsu, 2005; Almazan et al., 2005, 2011; Khonmee et al., 2014; Bansiddhi et al., 2018, 2019, 2020; Coals et al., 2019; Chatpongcharoen et al., 2021; Schowe et al., 2021; Fourage et al., 2023, 2024, 2025; Ghimire et al., 2024a, 2024b), companion animals (e.g., dog, pet animal, birds) (Harrington et al., 2019; Saengthong et al., 2025), and endangered or exotic species (e.g., endangered species, *Pongo pygmaeus*, *Nycticebus*) (Agoramoorthy, 2004; Moore et al., 2015; Fuller et al., 2018; Chatpongcharoen et al., 2021). Overall, the map demonstrates the close linkage among research on domestic animals, wildlife, and conservation, with a noticeable recent emphasis on wildlife and endangered species, such as Asian elephants.

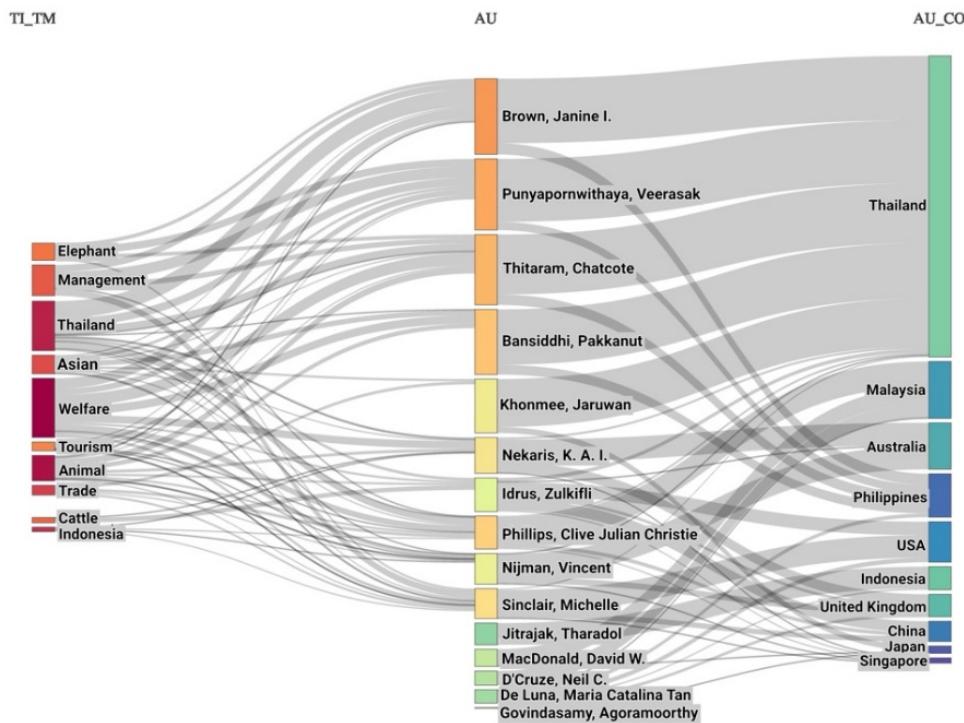


Figure 8 Three fields are plotted to demonstrate the connections between keywords from article titles, contributing authors, and countries in animal welfare research in Southeast Asia.

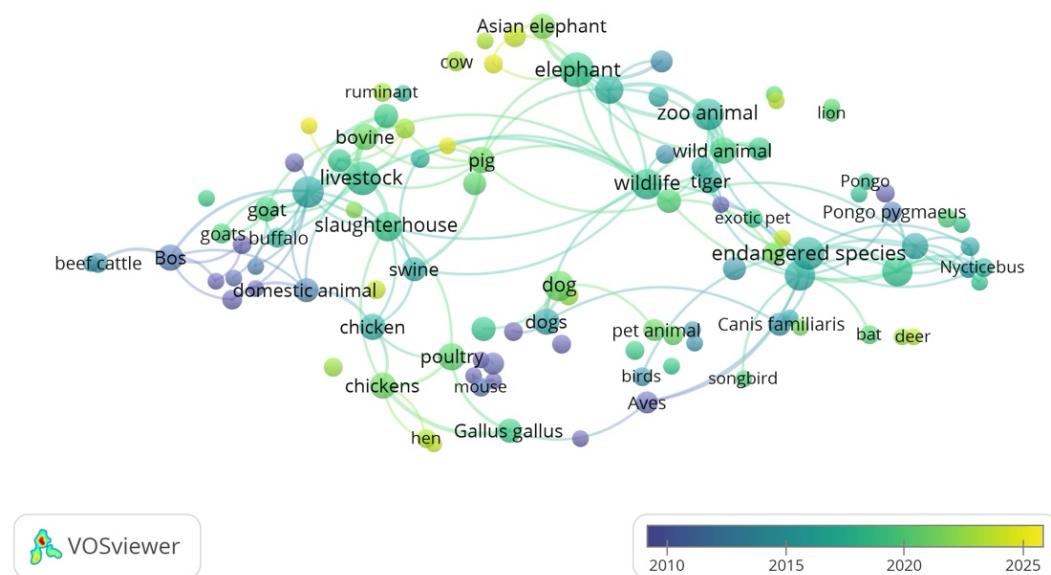


Figure 9 Network visualization that maps the co-occurrence of animal species and related terms in published articles on animal welfare research in Southeast Asia. The color of the circles reflects the average publication year. Blue colored circles indicate publication in the earlier years, while warm colors (yellow) indicate publication in the most recent years.

DISCUSSION

The majority of the publications are journal articles, which indicates that peer-reviewed journal outputs are the predominant mode of dissemination in this research field (Aria and Orcullo, 2017; Donthu et al., 2021). The review papers are fewer in number; however, they still serve as important references for further research as they synthesize existing literature about animal welfare. The keyword analysis suggests a multidisciplinary approach to addressing animal welfare concerns (Garcia and McGlone, 2022). The co-authorship rate is relatively high at 4.56 co-authors per document, reflecting a collaborative research environment. Meanwhile, international co-authorship is at 36.24% indicating that there is a significant cross-border research engagement and global relevance of animal welfare issues in Southeast Asia.

The majority of the authors wrote only one document; thus, only a few authors are highly prolific. The involvement of many occasional authors suggests a broadening base of interest and potential for further growth in the field. This demonstrates a classic pattern of scientific productivity distribution according to Lotka's law and further emphasizes both the critical role of core contributors and the inclusive nature of the field, which continues to attract new authors and perspectives (Pao, 1985).

There has been a sustained contribution by authors like Brown and Punyapornwithaya, indicating that they have maintained long-term research activities and contributed consistently over multiple years. De Luna can be considered an emerging contributor, suggesting the growing involvement of other authors in the field of animal welfare. The bibliometric analysis of authors involved in the field shows an increasing scholarly engagement in animal welfare research in Southeast Asia. Established authors played a pivotal role in sustaining the publications, while newer authors signal the continued expansion and diversification of the research community.

Chiang Mai University in Thailand ranks as the most prolific institution, indicating its prominent role as a regional hub for animal welfare research, especially regarding elephants (Sinclair and Phillips, 2019). Universiti Putra Malaysia follows, reflecting Malaysia's substantial contribution to the regional literature on animal welfare. Thailand emerges as the most active country, with four universities in the top ten authors' affiliation, namely, Chiang Mai University, Chulalongkorn University, Kasetsart University and Sakon Nakhon Rajabhat University. With 185 publications from these four institutions, Thailand signifies its leadership in animal welfare research in Southeast Asia. There is also the contribution of institutions from the United Kingdom and Australia, which suggests that there is robust international collaboration and knowledge exchange. This bibliometric analysis on authors' affiliation and country reflects a combination of the excellence of regional centers and strategic international partnerships (WOAH, 2025).

The structure of the research network reveals distinct geographical clusters, including Western nations and Southeast Asian countries with their neighbors. There is a strong line connecting Thailand and the UK or USA, demonstrating a collaborative ecosystem involving regional expertise and issues that are addressed in partnership with established international research communities. The co-authorship network shows a mature yet evolving field. The foundation was built with significant contributions from Western nations while there is a clear trend of increasing and recent activity from Southeast Asian countries.

Analysis of the most preferred journals reveals that the journal *Animals* stands out as the most significant platform. These findings suggest that while a few specialized journals dominate the field of animal welfare, researchers also utilize a diverse range of publication venues, from veterinary and zoology-focused journals to general science platforms.

The keyword analysis reveals that animal welfare research in Southeast Asia is not merely a general topic, but instead highly focused on specific issues. There is a strong emphasis on elephant welfare, particularly in the tourism sector, a significant concern for the wildlife trade, and a regional focus that indicates specific areas such as Northern Thailand for example (Loh et al., 2025).

The network visualization, which evaluates animal species as a focus on animal welfare research in Southeast Asia, reveals a clear thematic division. The current trend in animal welfare research in the region shows a strong and active emphasis on the welfare of livestock (Umpapol et al., 2011, 2014; Erian et al., 2019; Sadiq et al., 2020; Abubakar et al., 2021; de Luna et al., 2022; Hartcher et al., 2023; Nijman et al., 2023; Pirompud et al., 2023; Jainonthee et al., 2025a, 2025b; Rashid et al., 2025), and the Asian elephant (Bansiddhi et al., 2018, 2019, 2020; Norkaew et al., 2018, 2019; Brown et al., 2020; Ghimire et al., 2024a, 2024b).

This bibliometric analysis suggests that cross-border co-authorship is associated with greater scientific expertise and increased interdisciplinary collaboration, leading to research of higher quality and significance. Co-authors shared responsibility in ensuring that the research was accurate and conducted with integrity.

The journal *Animals*, as the most preferred journal (Abubakar et al., 2021; Brown et al., 2020; Coals et al., 2019; Erian et al., 2019; Fourage et al., 2024; Jainonthee et al., 2025; Rashid et al., 2025; Sadiq et al., 2023; Sinclair et al., 2017; Sinclair et al., 2019a; Sinclair et al., 2019b; Sinclair et al., 2019c; Sinclair and Phillips, 2019), may be used by future animal welfare researchers to publish their research findings for visibility and credibility. However, researchers may also explore other journals that include animal welfare in their scope to broaden the audience for their research.

Keyword analysis and network visualization of animal species in the published documents suggest a need to conduct further research on other animal species in Southeast Asia, including livestock and wildlife, given the region's animal welfare issues. Although measures to control stray animals in Southeast Asia are increasingly implemented, more research is needed to understand better the complexity of the problem associated with stray animal populations in the region. There is also concern about managing animals during frequent disasters in Southeast Asia, especially those related to extreme weather events and climate change.

CONCLUSIONS

This bibliometric analysis demonstrates that animal welfare research in Southeast Asia has shown sustained and measurable growth, with an average annual publication increase of 8.60% from 1987 to 2025. Thailand emerges as the primary regional hub, with Chiang Mai University contributing substantially to the scholarly output, and often in collaboration with established partner institutions in the United Kingdom, United States and Australia. Authorship analysis reveals that the research outputs are from occasional contributors and a core group of productive authors who make significant contributions to the field's sustained productivity and influence its trajectory. The thematic and species-specific analyses highlight a dual focus on regionally relevant concerns, which include Asian elephants and livestock. Broader topics include wildlife trade, tourism impacts and welfare assessment. The bibliometric analysis positions Southeast Asia as an increasingly influential contributor to the global animal health discussion with a research profile characterized by collaborative networks, thematic diversity and a capacity to address both foundational and emerging welfare challenges. These patterns suggest continued expansion of the field of animal welfare, with opportunities for deeper integration of region-specific knowledge into global frameworks for animal welfare science and policy.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

AUTHOR CONTRIBUTIONS

AMMQ: Conceived the topic for bibliometric analysis, performed the analyses and drafted the manuscript.

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