

Inequity by Design: Systematic Appraisal of the (in)Equities in Agriculture-Nutrition-Health Research Practices

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ABSTRACT

Research practices in agriculture, nutrition, and health (ANH) shape outcomes on food security and nutrition (FSN). Inequities in research practice are increasingly recognized as shaping the empirical approach and solutions identified to address FSN. We conducted a systematic scoping review, guided by a novel conceptual framework integrating six equity principles across 13 phases of the research continuum, to map (in)equitable research practices in ANH research from agenda-setting to dissemination, collaboration, funding, and authorship, compiled in an interactive Evidence and Gap Map. From five databases, 572 articles met inclusion criteria. Fostering research partnerships and community engagement were the most discussed steps along the research continuum (40%). "Authentic partnering" and "inclusion" were the most emphasized equity principles. Over one-third of articles provided practical tools to promote equity-centered research, including frameworks for community engagement, collaborative funding models, and inclusive authorship practices. Findings reveal both a characterization of equity challenges in ANH research and emerging pathways toward more just practices.

Keywords: equity, inequities, research practice, food systems, nutrition

1.0 INTRODUCTION

Despite decades of global efforts, 2.3 billion people remain food insecure, with approximately 733 million experiencing hunger (FAO et al., 2025). Currently, multiple forms of malnutrition co-exist – undernutrition, obesity and micronutrient deficiencies – which are worsening under food price inflation, ongoing conflict and the climate crises (FAO et al., 2025). These burdens are disproportionately felt by low-income countries and communities (HLPE, 2023). Empirical evidence shows that achieving Sustainable Development Goal (SDG) 2 of zero hunger and healthy lives cannot be realized without multisectoral efforts, among other prerequisites (Ruel et al., 2018). Addressing this complexity demands interdisciplinary research and practice spanning food and health systems, encompassing agriculture, nutrition, and health (ANH).

ANH research draws from diverse disciplines including tropical medicine, global health and nutrition, economics, geography, ecology, development studies, and anthropology. ANH research as a thematic niche itself has been shown to perpetuate epistemic injustice—discriminating against alternative ways of knowing by privileging dominant knowledge systems (Brock et al., 2024; Global Alliance for the Future of Food, 2021). This is a reflection that ANH disciplines share certain colonial legacies that can reinforce inequitable research practices in different ways (Camfield, 2024; Triki, 2022). Similarly, authorship bias favoring Global North researchers has been documented in both global health and economics disciplines (Kariuki and Marincola, 2023; Kaufman et al., 2023; Koffi et al., 2024) despite their differing publication norms — the former typically supporting multi-author papers, the latter tending toward single authorship. Further, gender and racial inequities are also pervasive: persistent wage gaps and underrepresentation of women and minority groups in global health and sociology disciplines (Hall, 1992; Pereira, 2021) reflect structural inequalities that stem from historical disparities in resources, opportunities and treatment between gender and social groups. Unequal partnerships and stakeholder exclusion have also been reported in conservation biology, global health, and research involving Indigenous communities (Amisi et al., 2023; Mabele et al., 2023). Moreover, funding for global research is overwhelmingly directed to institutions and researchers in high-income countries (HICs), often excluding decision-makers in low- and middle-income countries (LMICs) (Charani et al., 2022) and reinforcing generational colonial paradigms in global health research (Abimbola and Pai, 2020). Inequities in the undertaking of research can therefore intersect and be compounded during interdisciplinary research. Taken together, these practices can erode trust, hinder meaningful collaboration, and limit the effectiveness and inclusivity of ANH research.

Research practice encompasses the conduct of research and its related norms. Such practices throughout the research process — whether equitable or inequitable (henceforth '(in)equitable'/'(in)equities') — shape how problems are identified and defined, how empirical approaches are conceptualized and implemented, and what solutions are produced, thereby potentially perpetuating inequity (Harris, 2019; Harris et al., 2025). Reducing disparities in ANH outcomes requires addressing the underlying inequities in the knowledge production that informs such efforts. As an empirical effort to support this, we aimed to systematically identify and map available ANH literature on (in)equitable research practices, resulting in an interactive Evidence and Gap Map (EGM). Specifically, we aimed to: 1) develop a conceptual framework that embeds equity principles across the research continuum, and 2) use this framework to guide a systematic scoping review that: (i) maps evidence on such practices across disciplines and along the research continuum, and (ii) compiles recommendations to raise awareness of and remedy inequitable practices that can be adopted and scaled by individuals, research groups, and institutions.

2.0 METHODS AND MATERIALS

We conducted a systematic scoping review, valued for synthesizing, mapping, and analyzing broad or emerging evidence bases across interdisciplinary or multisectoral fields (Peters et al., 2015; Tricco et al., 2018). Our review followed an *a priori* protocol registered in the Open Science Framework in November 2022 ([10.17605/OSF.IO/QH3CN](https://doi.org/10.17605/OSF.IO/QH3CN)). The results are reported according to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Page et al., 2021). Given the disciplinary and methodological breadth of ANH research and the field's nascent engagement with equity, a scoping approach was well-suited to charting these emerging evidence intersections. An interactive EGM supplements the review, allowing users to filter literature by attributes such as equity principle or research continuum stage.

2.1 Developing a conceptual framework characterizing the research continuum and guiding equity principles

We reviewed a range of frameworks and guiding documents to inform a conceptual framework offering equity principles applicable across all steps of the research continuum, with special consideration for Global North–Global South (HIC/LMIC) dynamics and research involving Indigenous communities — both critical for ANH research. We selected the Canadian Coalition for Global Health Research (CCGHR) framework as the foundation because it was developed through a participatory, evidence-based process centering global research (Canadian Coalition

for Global Health Research, 2015; Plamondon and Bisung, 2019), drawing on extended dialogue with researchers, community partners, students, and funders globally reflecting on inequities in research practice (Canadian Coalition for Global Health Research, 2015). It also offers broad principles developed specifically for critical discussions about undertaking research(Plamondon and Neufeld, 2022), with definitions applicable across the research continuum rather than focused narrowly on one aspect, such as equitable partnerships(Monette et al., 2021), or a single stage, such as publishing.

The research continuum was defined based on the fundamental steps of undertaking interdisciplinary research, including engagement with funding/funders. We recognized that although research projects often begin with identifying knowledge gaps and securing funding, the process is rarely linear, evolving as evidence is generated and shared.

Box 1 describes each step of the research continuum; **Box 2** illustrates the CCGHR's six equity principles overlaid onto this continuum.

Box 1: A description of the phases in the research continuum

Research continuum step	Description
Funder research priorities	Donors define priorities by allocating funds and issuing thematic research calls.
Fostering research partnerships	Building research partnerships within and across organizations with aligned expectations and established shared norms.
Developing grant applications	Researchers within and across organizations collaborate to develop research grant proposals that respond to funding priorities.
Establishing interdisciplinary collaborations	Researchers from different disciplines develop a shared understanding and intellectual coherence around a common research question or idea.
Setting research aims	Research aims are defined, prioritized and finalized - often informed by government, development partners, or community's priorities, or building on existing evidence.
Securing funding and establishing financial administration	Grant funds are transferred from donors to lead grantees and onward to partners via established or new financial systems, often across countries, with due diligence protocols in place.
Obtaining research conduct approvals	Global research often requires government authorization and ethical clearance. Research involving human subjects must be reviewed by independent ethics committees to ensure adherence to principles of respect for persons, beneficence, and justice.
Engaging study community	Steps are taken to get local, community-based approval to collect data in communities - engaging and orienting community leaders and residents to the purpose of the research.
Collecting data	Data is collected from communities or populations by local or external data collectors
Analyzing data and data sharing	Data processing, management, and analysis address research questions. De-identification and creation of publicly available datasets occur in accordance with institutional, ethical, and funding requirements.

Publishing peer-reviewed papers	Paper production starts with setting an objective, choosing authors and methods, analyzing data, then writing the manuscript, responding to peer-review, revising, and either achieving acceptance or, if rejected, submitting elsewhere.
Disseminating research on other platforms	Research is communicated through various channels, including conferences, meetings with stakeholders in-country, community presentations, blogs, and social media.
Research culture	Research is shaped by a broader culture of values, attitudes, behaviors, and expectations that influence the steps in the research continuum.

Box 2: Guiding equity principles of scoping review*

1. **Authentic partnering:** focuses on ensuring that power and resource differentials and differences in norms and requirements are recognized by all partners and addressed throughout the partnership through open dialogue, trust building, and reflection. The principle focuses on building trust, open dialogue, and reflection reciprocally and inclusively involving local partners and communities, researchers, administrators, and decision-makers. It recognizes the complexity inherent in global research and invites researchers to address it.
2. **Inclusion:** centers the question, “How do our research practices proactively promote the involvement and participation of people who are historically marginalized (e.g., because of their race, class, sex, ability, religion, sexual identity, Indigeneity, etc.)?” and urges researchers to be inclusive of people and ways of thinking, to open space for reflection and mitigation of power imbalances.
3. **Humility:** fundamentally demands researchers to consider their positionality and to situate their role as one of “learning rather than knowing”. The principle requires researchers to accept that their knowledge is not absolute and not complete and that our experience and training shape it and, as such, to reflect one’s assumption, power and privilege when producing knowledge.
4. **Shared benefits:** a distributive principle. The principles necessitate every effort to identify and ensure how the research benefits society, communities,

those involved in the research, and so forth. It demands an expansive way of thinking to ensure that evidence production involves the capacity building of those involved in the research. Further, it pushes to minimize power differentials in access to data and findings so that those who are supposed to benefit from the research do.

5. **Responsiveness to causes of (in)equities:** It is fundamental to establishing equity-based practices as it acknowledges the imperative for researchers and the larger research infrastructures to recognize the historical, social, cultural, political and economic underpinnings of (in)equities. The principle calls for solidarity with social movements that seek to dismantle “the structures and processes that contribute to avoidable (in)equities” and recognize and respond to how we are individually and collectively enmeshed in these structures and processes.
6. **Commitment to the future:** reflects the “no one left behind” principles of the SDGs and brings focus to our shared connectivity and reliance on a shared vision for a future where everyone has their human rights met and that solutions identified now sustain generations to come.

These principles are relational and are grounded in social justice, equity, and human rights for all.”

*based on CCGHR’s framework which was developed through extended dialogue and documentation process with researchers, research and community partners, global partners, students, and funders, reflecting on (in)equities in research practice.

2.2 Search Strategy

The conceptual framework (Figure 1) guided the search process, encompassing:

1. Inequitable practices, defined as actions that marginalize, discriminate, exclude, or erase research actors, their perspectives, knowledge and contributions.
2. Disciplines under the Agriculture, Nutrition, and Health (ANH) umbrella, including agriculture, public health, economics, and development studies.
3. All stages of the research continuum.

ANH research focuses on the intersections between these three fields, examining how agricultural systems and practices influence nutrition and health outcomes. To capture both equitable and inequitable research practices (also referred to as (in)equitable practices), we

used terms aligned with the six CCGHR equity principles—authentic partnering, inclusion, humility, shared benefits, responsiveness to inequities, and commitment to the future. By "inequities" we mean differential practices, processes, and outcomes within research—rooted in the distribution of power and resources—that lead to unfair, avoidable, or remediable differences in how problems are framed, methods are conceptualized, and solutions are produced (HLPE, 2023).

We conducted a systematic search of five databases—EBSCO, Ovid, ProQuest, Scopus, and Web of Science—from January 1, 2012, to December 31, 2022. This timeframe reflects a resurgence in advocacy to address the root causes of (in)equities in research practices, which perpetuate broader inequities in food systems, driven in large part by global health journals, editors, and researchers (The Editors of the Lancet Group, 2019).

The search strategy was developed in consultation with an academic librarian specializing in systematic reviews. Multiple trial searches assessed comprehensiveness and sensitivity, allowing for breadth of literature and cross-disciplinary terminology without losing specificity. Synonyms for (in)equitable practices were informed by the CCGHR's six principles, and included terms such as "discrimination," "marginalization," "representation," "disparity," "positionality," and "bias," along with underlying processes such as racism, imperialism, colonialism, and supremacy (72 terms in total for "equity" alone). The full search strategy for one database is available in **Supplemental Methods 1**.

2.3 Eligibility criteria

Overall, we included articles that: (i) were published in English; (ii) were published between 2012–2022; (iii) were a peer-reviewed journal article, technical report, government document, thesis, or dissertation that clearly explored research practices related to one or more CCGHR equity principle; (iv) captured some part of the research continuum; and (v) fell within at least one discipline or thematic area grouped under agriculture, food systems, nutrition, or global public health, with a focus on malnutrition, food security, or global health.

Practices could describe dynamics among researchers, between researchers and institutions, researchers and research communities, or researchers or their institutions and the general public. Any research design, method, or geographical coverage was included. Eligibility criteria were refined as needed based on the first ~100 studies, with detailed logs kept of decisions made.

We excluded books, book chapters, scoping review protocols, introductions to special issues, and conference or workshop proceedings/abstracts, as well as papers without full-text access

across all represented author institutions. Clinical and medical studies were excluded unless explicitly pertaining to diet- and food systems-related noncommunicable diseases and complications. We also excluded articles that could not be located along the research continuum, or in which equity was discussed as a study population outcome rather than a research practice. A detailed explanation of inclusion and exclusion factors is in **Supplemental methods 2**.

2.4 Screening and Study Selection

A trained team screened records using Covidence as a reference manager for Title and Abstract (T&A) and full-text screening. Every entry was double-reviewed (AG, AM, RA, SM) at the T&A stage, with disagreements discussed and finalized by a third, senior reviewer (RA, SM). We adopted an inclusive T&A approach to enable iterative, discursive development of our knowledge in this field. A subset of full-text articles was then double-screened by two reviewers (AG, AM, ZW), with disagreements resolved in team meetings (SM, RA), until we reached a 90% agreement rate, after which articles were single-screened.

2.5 Data Coding and Analysis

Data extraction was performed in EPPI-Reviewer 4 using a coding framework (**Supplemental methods 3**) informed by the research continuum and CCGHR's equity principles. A priori codes were supplemented by an iterative coding process to capture salient characteristics as they emerged, such as researcher versus community populations, study context, and country location of first and last authors' institutional affiliation—previously used as a proxy for power distribution (Kamanda et al., 2013; Plamondon and Bisung, 2019). We also established and coded 23 (in)equitable practices, based on CCGHR equity publications and practices that emerged during full-text screening. Given the breadth of evidence and the aims of a scoping review and EGM, quality appraisal of whether equity principles were meaningfully enacted was not feasible, as few validated methods exist for this purpose. The review instead focused on collating and categorizing literature to inform ANH researchers' practice and identifying studies that discuss (in)equitable practices—some offering recommendations or tools, others describing the problem only. Rather than assessing depth of engagement, we coded whether studies specified particular (in)equitable practices, categorizing them as problem-oriented descriptions, evidence-unsupported recommendations, or solutions-oriented recommendations grounded in evidence, including lived experience. The study team was trained on the coding framework prior

to coding, and weekly meetings throughout screening and extraction ensured mutual understanding of coding terms, refined criteria, and addressed ambiguous articles. We extracted data on date, author and institution location (and thereby HIC/Global North or LMIC/Global South affiliation), discipline, country, World Bank economic classification, study context, study population (researcher and community), aims, evidence type, and methodology (detailed in **Supplemental methods 3**). We quantified articles detailing strategies for addressing or advancing (in)equitable practices and flagged those reviewers deemed exemplary. A single reviewer completed data extraction (AG, AS, PS); independent reviewers (SM, RA) double-coded 10% of included articles to validate extraction criteria. Post-extraction coding assigned disciplines, as the term "domain" in the ANH (Agriculture-Nutrition-Health) nexus was found to overlap. A two-step process categorized articles: first, the primary author reviewed each journal's description and assigned a relevant discipline; these were then simplified into five overarching disciplines—Public Health (including clinical, global health, and nursing), Development and Economics, Environment and Ecology, Agriculture (aquaculture, agronomy, livestock), and Nutrition and Diets. Descriptive analyses were conducted and synthesized to address the study's three key aims, supplemented by exploratory one-way and two-way frequency analyses of all variables. Two-way frequencies were examined by question, discipline, the six equity principles, and the 13 research continuum stages, using R and Flourish for analysis and visualization. The evidence gap map was created in EPPI-Reviewer 4, producing a standalone, interactive HTML file. Exemplary articles were qualitatively reviewed and used as case studies throughout the paper. Articles were mapped onto an EGM using EPPI-Reviewer, allowing users to visualize studies on a matrix (rows: six equity principles; columns: research continuum stages), with bubble size reflecting the number of studies at each intersection. Bubbles are segmented by whether papers proposed solutions, offered "wish-list" (aspirational) recommendations, or were problem-oriented only. Selecting a cell displays a bibliography of studies at that intersection, and users can filter the map by study characteristics.

3.0 RESULTS

3.1 A guiding conceptual framework: Integrating six equity dimensions in 13 phases of the research continuum

Research projects often begin by identifying knowledge gaps and securing funding, but the process is rarely linear, evolving as evidence is generated and shared. Figure 1 presents a conceptual framework combining key phases of the research continuum with equity principles

that can shape research practice. The framework outlines the 13 key phases, including funding priorities and research partnerships, while centering equity. Institutions—especially funding entities, universities, and research organizations, also depicted in **Figure 1**—play a large role in ensuring equity across the continuum. Funding entities hold significant power to define research priorities, set the tone for how research is conducted, and provide resources necessary to embed equity throughout the process. Institutions also interact with individuals, such as research professionals (researchers and financial administrators) and study communities, and can foster (in)equity at every stage.

Equity principles represent the core standards in our framework, while equity practices are the activities that operationalize them. (In)equitable research practices, whether stemming from disciplinary norms or other factors, can permeate the entire continuum—from how and when funding priorities are set through to data dissemination and access. The overlap of research-continuum phases and equity principles in our framework depicts how (in)equitable practices can be embedded throughout knowledge production, ultimately shaping the resulting evidence base.

Review results

The study selection process is shown in the PRISMA Flowchart (**Figure 2**). Across the five databases, 18,597 unique articles were retrieved after removing duplicates and screened on title and abstract. Of these, 1,412 were retained for full-text screening. Articles were excluded at this stage primarily because they did not focus on equity issues specific to undertaking research (i.e., captured inequities in outcomes only) or fell outside agriculture, nutrition, and/or health research domains. The 572 articles meeting review criteria were analyzed quantitatively and qualitatively and mapped into an interactive EGM ([HTML linked to this article](#)). Summary statistics presented henceforth are not additive to the total included, as many articles covered multiple research-continuum steps, equity principles, and populations/settings.

Figure 1: Conceptual framework depicting the core equity principles grounded in the research continuum and the influence of research actors and governance on equitable research practice.

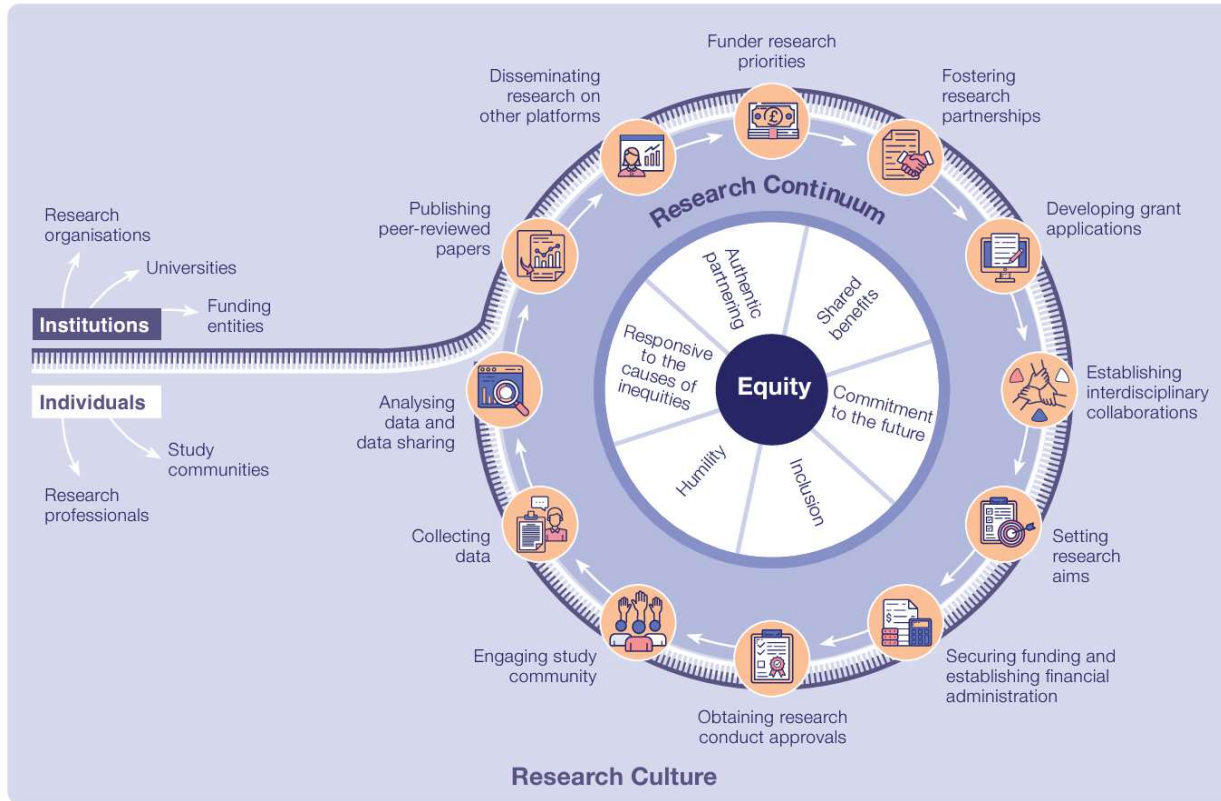
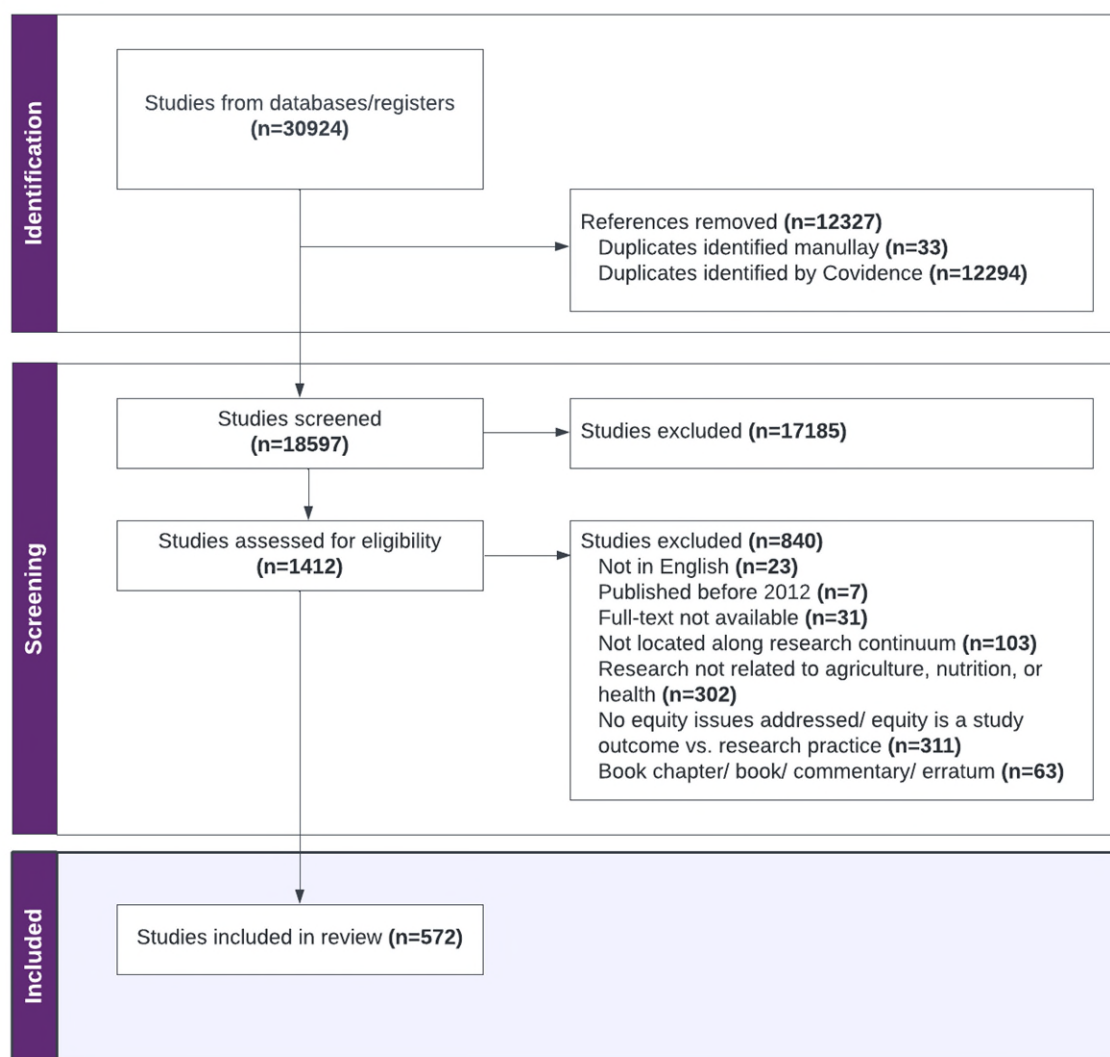


Figure 2: PRISMA Flowchart from identification, screening to final inclusion

3.2 Time trends and study setting

Literature characterizing (in)equities in ANH research has grown steadily from 25 articles/year since 2012 (the first search year), increasing notably to >75 articles/year from 2020–2022 (**Supplemental Results 1**).

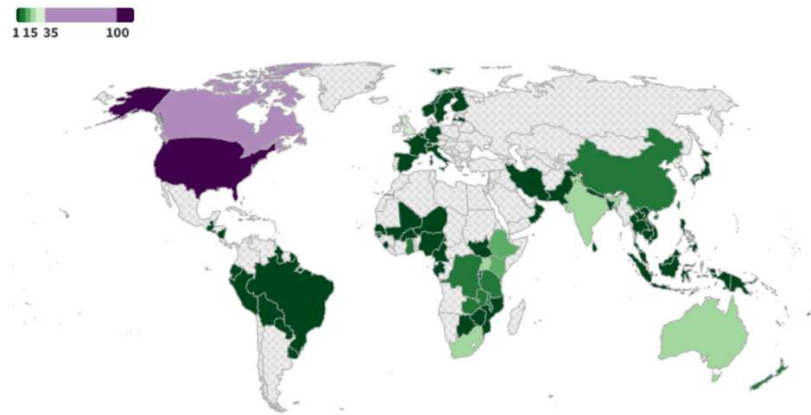
A nearly equal number of articles reported HIC (n=225) and LMIC (n=202) study settings (**Figure 3A; Supplemental Results 2**). Although more than half of studies specified their setting—covering 75 countries—the distribution was skewed, with a small number of countries dominating. Most studies (n=117) were conducted in the United States, followed by Canada (n=39) and the UK (n=25). From LMICs, Uganda, Kenya, Ethiopia, South Africa, and India each had >10 articles documenting (in)equities in research practice (**Figure 3A**). Certain settings

were markedly underrepresented, including upper-middle-income settings (n=18) and small developing island states (n=2) (**Supplemental Results 2**). Nearly one-third (n=162) of articles did not specify a study setting, describing (in)equities in research practice in a broad global context.

3.3 Author affiliation

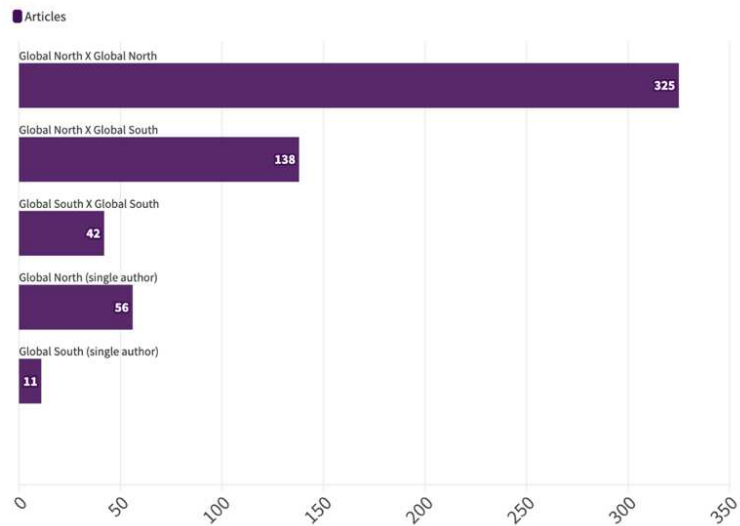
First authors' institutional affiliation was predominantly Global North (n=467) versus Global South (n=102) (**Supplemental Results 3**); trends were similar for last authors. Fewer than ten first authors (n=5) and last authors (n=8) identified as Indigenous peoples. We also coded first–last author affiliation pairs (**Figure 3B**): over half (n=325) were affiliated with Global North institutions only, a quarter (n=138) with both Global North and Global South institutions, and 42 with Global South institutions only. Among articles documenting (in)equities in LMIC contexts, 165 had first or sole authors affiliated with Global North institutions. None of the articles describing (in)equities in HIC contexts had first or sole authors affiliated with Global South institutions; among these, 23 included last authors affiliated with Global South institutions (**Supplemental Results 4**).

Figure 3A Legend: Distribution of study settings describing *(in)equities* in ANH research practice



Source: World Bank Official Boundaries

Figure 3B: Number of articles by geographic location (global north vs global south) of first and last authors' institutional affiliation



3.4 Thematic research area, evidence type, methodology, and populations

The predominant research domain (or thematic area) was global public health (n=367), followed by agriculture (including aquaculture, livestock) & environment (n=81), food systems (n=57), and food security and nutrition (n=47) (**Supplemental Results 5**).

Over half of the articles used empirical (observed and measured) data, including both primary (n=264) and secondary data (n=66). Other evidence types included commentaries/perspectives (n=167), synthesis/reviews (n=74), and guidance documents/tools (n=38); we identified few grey literature articles or working papers (n=10) (**Supplemental Results 6**). A third of articles used qualitative methods (n=173), and nearly another third (n=156) were theoretical, conceptual, or methodological. Ninety-five used mixed methods, and only a tenth (n=59) used quantitative methods (**Supplemental Results 7**).

Forty-five percent of articles (n=257) focused on research (in)equities related to specific populations: 60 on Indigenous communities, 48 on agricultural workers, 41 on minority (religious, ethnic, or racial) populations, 29 on women and gender-diverse groups, 18 on children, infants, and adolescents, and 17 on clinical populations. Few articles addressed refugee or migrant populations (n=8) (**Supplemental Results 8**).

3.5 Research continuum

Figure 4 depicts the distribution of articles across the 13 phases of the research continuum. The most studied phases were fostering research partnerships (n=230), engaging the study community (n=228), setting research aims (n=136), research culture (n=118), collecting and gathering data (n=110), and funder research priorities (n=104). The least documented were developing grant applications (n=10), securing funding and setting up financial administration (n=12), and obtaining national research conduct approval (n=13).

3.6 Equity principles and inequitable practices

Equity principles are the core tenets in the conceptual framework, while equity practices are the specific actions that manifest them. Of the six principles, authentic partnering (n=220) and inclusion (n=188) were most characterized. Many articles also described (in)equities related to shared benefits (n=108), commitment to the future (n=104), and responsiveness to the causes of (in)equities (n=89). Humility was minimally captured (n=44) (**Figure 5**).

We iteratively coded an additional 24 categories of inequitable practices (**Supplemental Results 10**). Recurring themes included inclusion/exclusion (n=266), trust/mistrust (n=136), agency/lack of agency over decision-making (n=118), and access to/barriers to funding (n=111).

Less commonly discussed but distinct themes included conflicts of interest (n=6), job security (n=8), stigma (n=17), implicit biases (n=39), exploitation (n=45), access to technology (n=55), marginalized/erased knowledge (n=63), and institutionalized prejudices (n=72). Other (in)equitable practices did not fit these categories (n=64), including: problematic "donor-imposed" theories of change that apply linear impact assessment without context (Apgar et al., 2017); nurturing local research leadership (Atkins et al., 2016) and bidirectional capacity sharing (Redman-MacLaren et al., 2012); the lack of access to career development services for historically marginalized communities (Beech et al., 2020); lack of training on ethical and equity issues in global health research (Chu et al., 2022); limited methodological pluralism (Hardy and Patterson, 2012); lack of research contextualization (Kilanowski, 2014); project legitimacy (King et al., 2014); knowledge/learning as a public good (Lyon et al., 2021); global mobility and visa processes (Wondimagegn et al., 2022); feminist approaches to engagement and equitable research modes (Erikainen et al., 2021); inaccessibility of scientific language and language barriers (Horwood et al., 2021); underinvestment in human resources to sustain research (Choquez-Millan et al., 2024; Haelewaters et al., 2021; Plamondon and Bisung, 2019); and "coloniality of knowledge," where social position and geopolitical forces shape knowledge production in colonial ways (Wondimagegn et al., 2022).

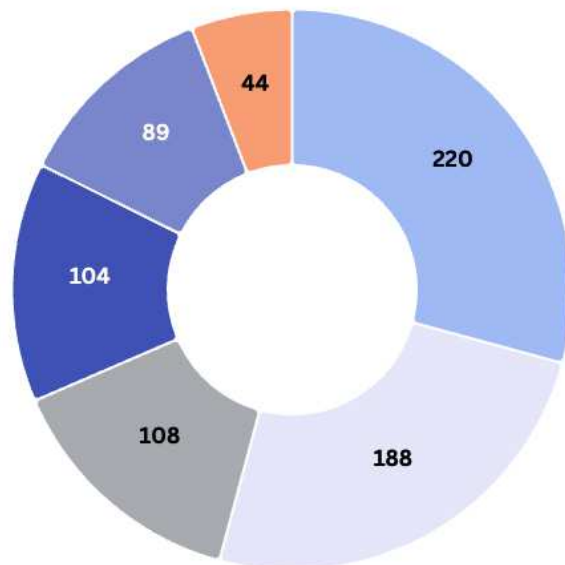
Even when grouped by overarching equity themes, both language and perspectives varied. Papers grouped under "authentic partnering," for instance, described "meaningful engagement" differently: many framed it as participatory research co-designed from question through dissemination (Kamanda et al., 2013; Kondo et al., 2019; Kumar et al., 2014), while others offered critical reflections on power dynamics within partnerships—particularly voices lost or excluded from decision-making (Apgar et al., 2017; Atkins et al., 2016; Ebata et al., 2020) and on interrogating one's own disciplinary training and its historical underpinnings and boundaries (Beech et al., 2020; Chu et al., 2022).

Figure 4: Number of articles included in review by research continuum step



Figure 5: Frequency of articles by six core equity principles

Authentic Partnering Inclusion Shared benefits Commitment to the future
 Responsiveness to the causes of inequities Humility



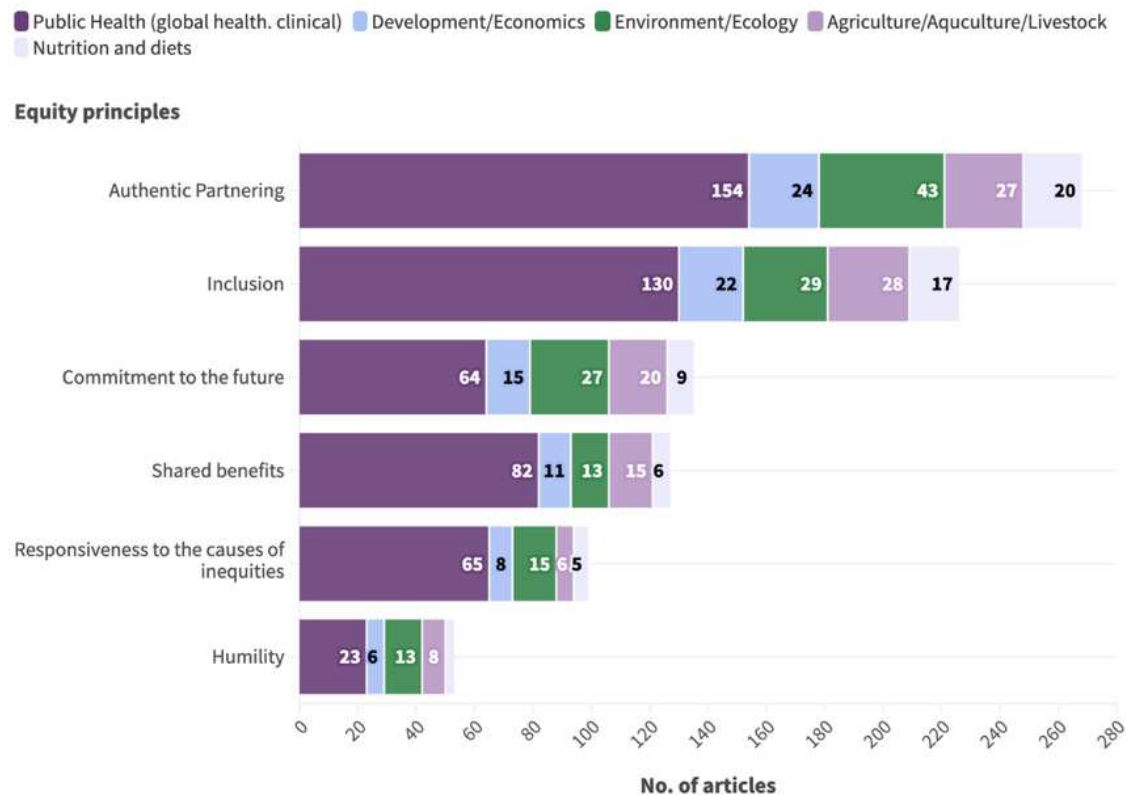
3.7 Differences by discipline

Disciplinary focus was also coded (see Methods for the distinction between domain and discipline). Majority were from public health (n=397), followed by environmental science/ecology (n=96), agricultural sciences (n=81), economics/development studies (n=67), and nutrition/dietetics (n=46) (**Supplemental results 9**).

Overall, the literature shows no disciplinary differences in how frequently the six core equity principles or research-continuum phases are characterized (**Figure 6**); the same principles and phases were emphasized, mirroring the findings described above.

Focusing on evidence-synthesis/review papers (n=74)—reflecting disciplines' efforts to comprehensively understand a topic(Munn et al., 2018)— 46 were from public health, 16 from environment/ecology, and 16 from agriculture (including aquaculture and livestock).

Nutrition/dietetics, development, and economics had fewer than 10 review articles on (in)equities. Public health reviews addressed: (i) research process challenges within clinical global health programs, especially in fragile contexts; (ii) equity in partnerships and funding, especially within multi-sectoral collaborations; (iii) bibliometric analyses illustrating (in)equities in author order; (iv) who is and isn't being researched, and who is researching whom; and (v) gender and geographic disparities in authorship. Environment and ecology literature, by contrast, focused on: (i) knowledge production and exchange, especially linked to Indigenous knowledge systems; (ii) cross-cultural research; (iii) disciplinary research (inter-, multi-, trans-); and (iv) environmental justice. The [interactive EGM](#) can be filtered by reviews, themes, and sub-themes to explore these nuances.

Figure 6: Bar chart of equity principles described in articles, segmented by discipline

3.8 Proposed solutions

Over a third of articles (n=192) described solutions-oriented recommendations, offering practical behaviors that researchers and institutions can adopt to reduce inequities in the research process; these were tested through lived experience or experimental settings. About half (n=270) offered a "wish list" of recommendations—i.e., untested/unapplied recommendations, typically found in articles' discussion sections. The remaining 112 articles were problem-oriented descriptions without recommendations. Many tested, practiced, or described solutions focused on inclusion/exclusion, trust/mistrust, agency over decision-making, access to funding, and institutionalized prejudices (**Figure 7A**). These ranged from tools and frameworks to reflexivity questions for individuals, teams, and stakeholders, guidance for funders, reflective exercises, knowledge fairs, and collectives.

We coded the intended audience for all articles, specifically researchers, academic or research institutions, government entities, donors, and ethical review boards (**Figure 7B**). There was no notable difference in the intended audience when the articles were segmented by whether they offered solutions or not. Focusing in on the 192 solution-oriented papers, the majority (n=161)

Figure 7A: Bar chart showing the number of articles by type of recommendation to mitigate inequitable research practices, segmented by articles with untested and tested recommendations

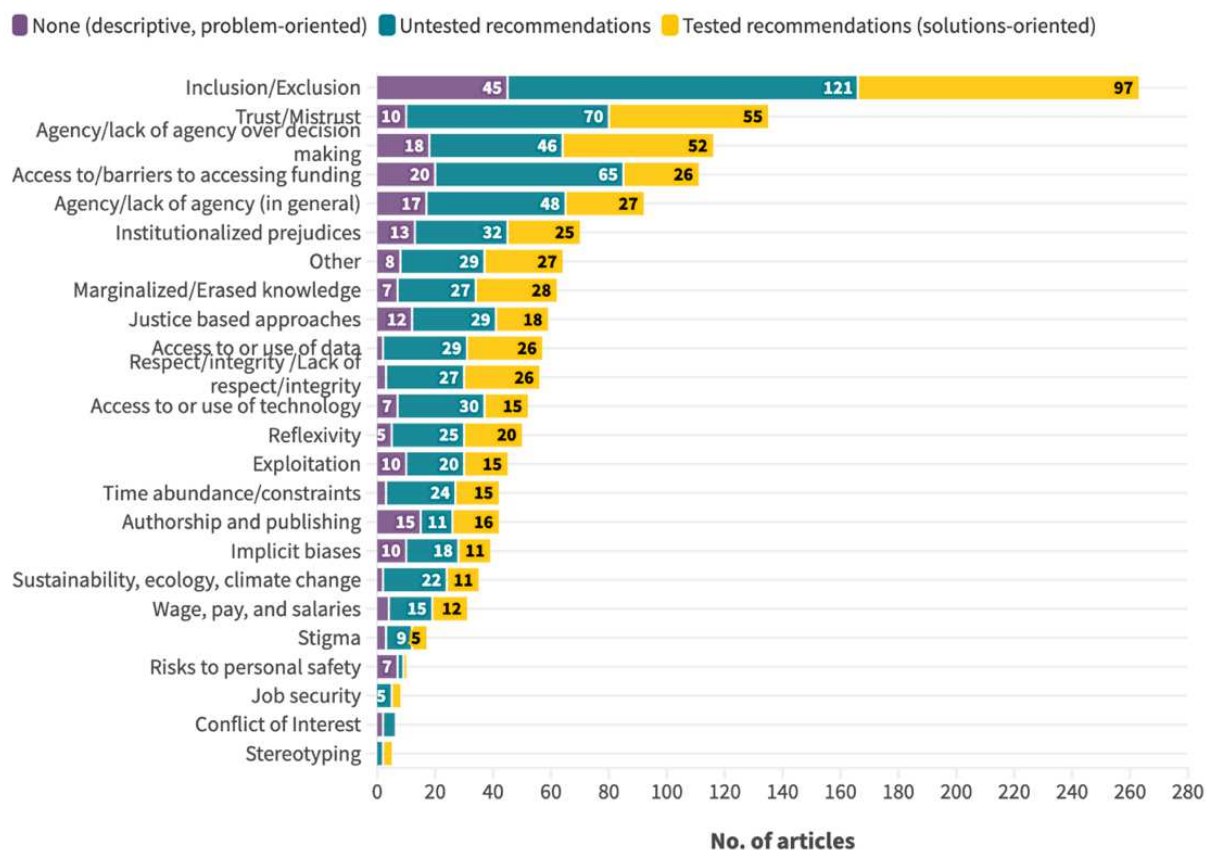
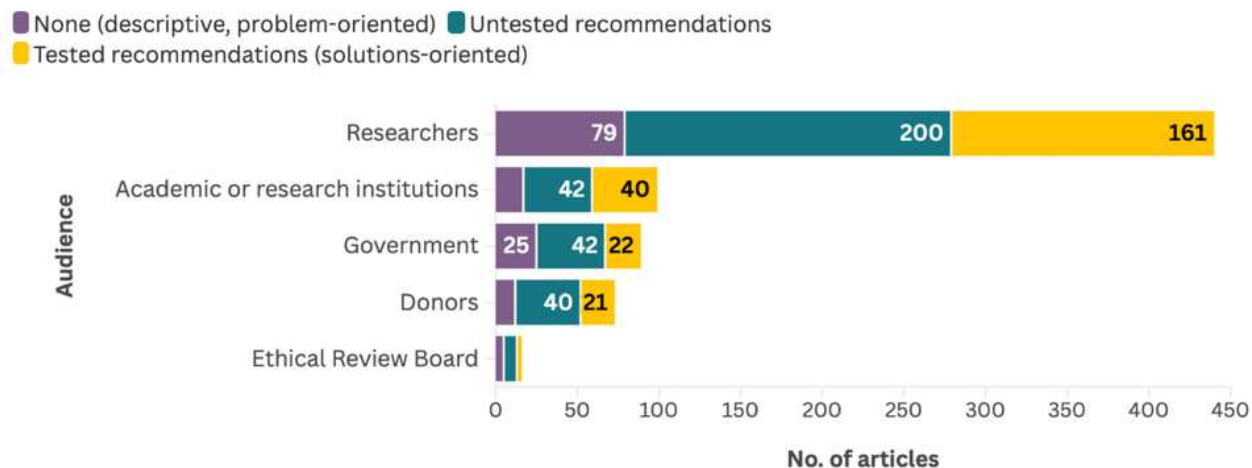


Figure 7B: Bar chart of target audience of articles, segmented by problem-oriented articles and those with proposed and practiced solutions



were addressed to researchers overall, followed by academic/research institutions (n=40), and <15% to government (n=22) and donors (n=21). We further disaggregated the intended audience to get a sense of the types of researchers targeted by solution-oriented papers. Over half (n=107) offered recommendations for the individual researcher, forty percent (n=75) for research groups, and fewer for researchers specifically in the Global South (n=13), Global North (n=16), or both (n=17).

Proposed and practiced solutions to *(in)equitable* practices in ANH addressed diverse challenges, needs, and dynamics. **Table 1** highlights exemplary articles featuring notable solutions and related recommendations; in the EGM, solution-oriented studies are color-coded for reference. The collection identifies structural and administrative barriers that perpetuate inequities, while proposing solutions such as decolonial funding review processes, modified authorship guidelines, and context-adapted research methodologies to promote more equitable research practices. Several solutions sought to strengthen authentic partnering. One example shifts partnerships away from “top-down” models toward research governance that embeds Indigenous knowledge systems and culture. The Culturally Adaptive Governance Framework (CAGF), proposed by Duke et al., 2021 centers ethics and equity in Indigenous health research by emphasizing translational impact, adaptive governance, and critical allyship among non-Indigenous and Indigenous researchers, community organizations, and communities themselves. Similarly, through a co-production approach to inclusive research practices, Liddiard et al., 2019 illustrate the development of a co-research collective among people with disabilities, underscoring the role of intersectionality and the importance of virtual research environments in facilitating participation. Cassola et al., 2022 and Sridhar et al., 2015 both provide recommendations and tools for funders to enhance equity in the research process. Cassola focuses on setting research priorities more inclusively and ensuring shared benefits, while Sridhar et al. present the PLANET (Planning, Monitoring and Evaluation) Tool to improve transparency and fairness in monitoring development-assistance funding.

4.0 Discussion

Practices that rely upon and/or entrench power imbalances across interdisciplinary research risk shaping the questions asked, the information presented, the solutions envisioned, and the effectiveness of resulting actions, and may contribute to poorer outcomes. To understand these *(in)equities*, we developed a conceptual framework guided by six equity principles across 13 phases of the research continuum, then systematically mapped and analyzed articles describing research *(in)equities* in agriculture, health, and nutrition using established equity frameworks as

our analytical lens. We identified 572 documented (in)equities spanning the entire research continuum, from funding and agenda-setting to dissemination. Half the studies employed empirical data, and most articles originated from the broader public health discipline, encompassing global health, nursing, health disparities, nutrition, and clinical care.

Four key insights emerge from this review.

First, certain disciplines—notably global health—were more prolific in capturing equity issues than others (e.g., agricultural sciences), although all ANH disciplines documented each of the six equity principles.

Second, ‘authentic partnering’ and ‘inclusion’ were the most commonly noted equity principles, reflecting substantial documentation around ‘setting agendas/aims’ and ‘funding’, ‘building equitable partnerships’, ‘community engagement’, and ‘data collection’. These were thematically linked to substantial literature on inequitable practices reflecting a lack of agency, trust, and respect, as well as institutional prejudices shaping partner relationships and community engagement. This focus on ‘authentic partnering’ is also evident in evolving funder requirements, many of which now mechanistically facilitate more equitable partnerships—for instance, through equal budgets and grant applications led by LMIC institutions and researchers (“ANH Academy Competitive Research Grants,” 2025; “Research Funding Opportunities - Grant Funding,” 2025; TRUST, 2018). However, the review captures fiscal and administrative inequalities (**Table 1**) that undermine equitable North–South partnerships, exemplifying **“infrastructure violence”** (Crane, 2020; Crane et al., 2018), wherein bilateral government funders in the North allocate markedly different indirect costs to Global South versus Global North grant recipients. ‘Securing funding and establishing financial systems’ was the least-discussed research phase, a notable gap, as robust funding and its systems underpin an enabling environment required for high-quality research (Ingenhoff et al., 2025). Solution-oriented papers offered alternative approaches: while many emphasized community-based participatory research, some extended to institutional tools for designing and monitoring equitable partnerships. The Research Fairness Initiative (RFI), for instance, provides institutions (including the private sector) a mechanism and indicators to assess fairness in opportunities, processes, and outcomes across research stages, fostering authentic partnering (Carvalho et al., 2018). Apgar et al. developed a context-based methodology using participatory action research to create a theory of change (TOC) addressing complexity in socio-ecological systems (e.g., food systems), enhancing legitimacy, rigor, and transformative change through the TOC process; they illustrate how institutionalizing reflective practice at multiple levels (institutions, researchers, donors) underpins transformation toward equitable outcomes (Apgar et al., 2017).

Third, some parts of the research continuum—such as ‘fostering partnerships’ and ‘engaging study communities’—received more focus than others, like ‘grant writing’ and ‘securing approvals and funding’. Inequitable practices throughout the ANH research process were unified by power asymmetries operating at multiple levels: within high-income countries (Jenkins et al., 2021; Mosby, 2013) (especially the United States), produced by high-income researchers working in low-income countries (Jenkins et al., 2021; Lawrence and Hirsch, 2020), and within low-income countries themselves (Aggett, 2018; Aryeetey et al., 2017). All shape the “what and how” of knowledge production and underscore the need for inclusion and decolonization of research. Nguyen described how Global North colonial epistemologies shape methodological trajectories and determine whose voices are heard (Nguyen, 2020). Global North researchers may amplify some Global South communities deemed important or underrepresented—such as those facing intersectional inequities (e.g., low-income girls with disabilities)—while other perspectives (e.g., fathers, older people) remain underrepresented, or the onus for action falls on the most vulnerable rather than being carefully dispersed. Among highly vulnerable groups like refugee populations in conflict zones, problematic power disparities include lauding Global North researchers for “bravery” in conducting research already undertaken by local Global South NGOs, sometimes even when it inadvertently endangers participants (Cronin-Furman and Lake, 2018). Exclusion and the “coloniality of knowledge” also limit different forms of knowledge: in agroecology, Indigenous knowledge on biodiversity is often excluded (Gómez et al., 2013), despite evidence it substantially improves outcomes when integrated (Gardner et al., 2020; Vera, C, 2018). Gendered exclusion also persists—women’s expertise is undervalued and authorship remains male-dominated: one review found 92% of agroecology articles included male authors versus 57% female (Gómez et al., 2013), and in global health, women had half the odds of first authorship compared to men, with LMIC women facing even lower odds (Gurung et al., 2021).

Finally, a converging theme was that addressing inequitable practices requires layered sensitization and robust governance solutions. Central to this is ensuring funders and research capacity development explicitly and strategically consider equity (Atkins et al., 2016; Franzen et al., 2017; Kang et al., 2015). A key strength of this review is identifying actionable solutions for funders, institutions, and researchers across the Global North and South, made fully available through the EGM.

Significant research gaps remain. Few studies addressed the equity principle of humility, including those led by LMIC researchers; most studies on LMIC contexts were authored by HIC researchers in first or last author roles—positions often associated with expertise, ownership, or

significant contribution. This may partly reflect our restriction to English-language publications. Research on (in)equities within LMICs, particularly involving Indigenous communities in Africa and refugee or migrant populations, was scarce (only eight relevant articles). Early research stages, i.e. setting aims, grant development, financial capacity-building, were rarely examined, and (in)equities in fields like economics and agriculture were underrepresented. Unlike other global research fields (Kalinga, 2019; Kamuya et al., 2015), the ANH literature lacked discussion of within-country equity issues, which undoubtedly exist within LMIC contexts and may be inadvertently reinforced through tokenism that homogenizes LMIC researchers or communities; established national norms and hierarchies can further perpetuate these disparities (Biruk, 2018). We urge funders, journals, and editors to prioritize these issues. This is the first review to systematically map inequities in ANH research across the entire research continuum, highlighting disciplinary differences in research conduct while offering practical solutions. Unlike most studies, which focus on select phases, this review comprehensively addresses equity concerns across all stages and incorporates interdisciplinary considerations, positioning it to inform ongoing efforts toward more equitable ANH research practices. Other strengths include a novel conceptual framework offering guidance for integrating and reinforcing equity throughout the research continuum, relevant to researchers, institutions, and funders alike.

This review also has limitations. It excluded non-English publications and applied an equity framing (CCGHR) initiated by Global North researchers, albeit one developed participatorily; both factors likely excluded important contextual perspectives—the language restriction due to team capabilities, the framing due to its grounding in a particular geopolitical context. We also focused largely on peer-reviewed literature, omitting blogs, research group websites, oral histories, and other knowledge forms that may have offered additional insight, including underreported practices. Second, despite our efforts toward inclusive search and inclusion criteria, the breadth of ANH fields and diversity of disciplinary terminology may mean some language describing (in)equitable practices was not fully captured; we sought to mitigate this by using a range of synonyms for core equity-related concepts and running multiple iterative searches. Third, we adopted a pragmatic approach to identifying author origin, gender, institutional affiliation, and disciplinary background, acknowledging this does not capture the full complexity of identities shaping power dynamics; given the unexpectedly large volume of literature, this pragmatic approach also applied to our analysis, and readers are encouraged to explore areas of interest further through the EGM. Finally, while the conceptual framework underpinning this review offers a novel framing, its broader applicability warrants further

examination. Equity can be conceptualized differently across disciplines, and the CCGHR framework—while well-suited to guiding this review—may not fully capture alternative analytic lenses used elsewhere, such as the decolonial framework recently developed by Naidu et al., 2024.

5.0 CONCLUSION

Increasingly, challenges across food systems, nutrition, and health are shaped by structural and socio-ecological determinants demanding multidisciplinary solutions and convergence in decision-making. Achieving this convergence requires more than technical alignment: it depends on embedding equity into the research process itself, from the outset. Equity must be seen not only as an outcome but as a necessary condition for just and sustainable food system transformation. The shift we need, true food system transformation, must begin with critical examination of how research is conceptualized and conducted, requiring humility, reflection, an iterative approach, and clear guideposts. Improving the equity of this process will not only create a more amenable environment for positive change but also broaden and deepen this field's transformative potential.

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7.0 REFLEXIVITY STATEMENT

See Supplemental Material (Supplemental Statement 1)

Table 1: Papers illustrative of important equity considerations in research practice

Topic	Title(s)	Author(s)	Key (in)equitable practices	Why did we think it was good?	Recommendation type
Data sharing in LMIC	Ethical principles for promoting health research data sharing in sub-Saharan Africa	(Anane-Sarpong et al., 2020)	data sharing, public health surveillance, research ethics	This paper presents an empirical study on challenges to data sharing in LMICs, despite the potential benefits in under-resourced settings and for global public health. Though data sharing is the desired “default field of public health,” this paper highlights concerns about reciprocal justice, acknowledgement, and a lack of harmonized guidelines to institute fairness and equity in global data sharing.	Recommendation (aspirational)
	Best practices for ethical sharing of individual-level health research data from low- and middle-income countries	(Bull et al., 2015)	data sharing, health data, reciprocity, clinical research, public health research	This literature review was the first empirical study in the fields of clinical and public health on stakeholders’ perspectives about individual-level data sharing in LMICs. This paper advocates for the creation of data-sharing models for equitable practice in similar settings, shaped by four requirements: the likelihood that sharing will contribute to scientific knowledge relevant to health care, minimal risk of harm, fairness and reciprocity, and trust.	Recommendation (solutions-oriented)
Who sets the agenda matters	Who sets the global health research agenda? The	(Sridhar, 2012)	priority-setting, funding, international	This article explores multi-bi financing, defined as “the practice of donors choosing to route non-core funding—ear-marked for specific sectors, themes,	None (descriptive, problem-oriented)

	challenge of multi-bi financing		cooperation, multi-stakeholder initiatives, global health research governance	countries, or regions—through multilateral agencies and to the emergence of new multi-stakeholder initiatives” and its implications on global public health. Though a potential signal of increased multilateral cooperation and health funding, such funding mechanisms may restrict research agendas to specific health initiatives with little input from impacted communities.	
	Exploring the ethics of global health priority-setting	(Pratt et al., 2018)	priority setting in research, global health research, low- and middle-income countries, health justice	This paper presents the reflections of an international workshop on priority setting, during which participants discussed ethical requirements for priority-setting at the global and national levels. The workshop was used to launch a research agenda for global health priority-setting, structured by three sets of ethics questions: relationships between research scopes (e.g. national, institutional); the prioritization of certain values and substantive criteria; and processes to ensure fairness and justice in decision making.	Recommendation (solutions-oriented)
Gender of authors matter for analyses	The gender and geography of publishing: A review of sex/gender reporting and author representation in leading medical and	(Merriman et al., 2021)	sex/gender analysis, gender-sensitive research, publishing guidelines, intersectionality	Research journals have long-favored publications from men in high-income countries with additional barriers for women and/or individuals in low-income countries. Despite new guidelines and editorial policies to increase the use of gender/sex analysis, such analyses are still infrequently used but are over two-times more common in articles published by women. Gender and geographical affiliation were	Recommendation (solutions-oriented)

	global health journals			also found to be separate but compounding influencing factors on publishing, with women in LMICs at the most disadvantage. The research of this study highlights the importance of sex/gender analysis to develop gender-responsive policies, as well as the need to continue to mitigate publication barriers to allow for culturally relevant research.	
	A global call for action to include gender in research impact assessment	(Ovseiko et al., 2016)	path dependency, research impact assessment, recommendations, call to action	Global investment in health-related research does not benefit everyone equally. Rather, health-related research investments are unevenly distributed by gender, reflecting historical gender biases that have created a path dependency. This paper examines this path dependency and argues that research impact assessment may be used to move the needle on historical biases. Included in this article are specific solutions for multiple audiences (e.g. funders, evaluators) to engage in such work.	Recommendation (solutions-oriented)
Within country (in)equities	<i>The Challenges of Research Informed Consent in Socio-Economically Vulnerable Populations: A Viewpoint from the Democratic Republic of Congo</i>	(Kalabuanga et al., 2016)	informed consent, research ethics, sub-Saharan Africa, vulnerable populations, clinical research	Informed consent is a pillar of research ethics, and consent tools must be modified to match the local population and research context. This article explores challenges working with and receiving informed consent from vulnerable populations in the Democratic Republic of Congo, including children, illiterate subjects, and individuals living in poverty. Ultimately, the authors conclude that informed consent procedures must be adjusted to specific socioeconomic conditions, requiring collaboration	Recommendation (solutions-oriented)

				between researchers, ethics committees, and regulators.	
	Do Black Lives Matter in public health research and training?	(Rosenberg et al., 2017)	public health, health burdens, research funding, United States	Public health's goal is to protect the health of all people, but race-based health disparities fall short of achieving that goal. This article examines whether research funding in the U.S. reflects the disproportionate health burdens experienced by white and black Americans. Altogether, findings indicate that, while homicide was the number one contributor to potential years of lives lost amongst black Americans (at the time of writing), this area of research lacked funding and publications. Disproportionate investment in public health poses the risk of continuing to disadvantage specific racial groups with the United States.	None (descriptive, problem-oriented)
(in)equities and technology	Model farmers, extension networks and the politics of knowledge transfer	(Taylor and Bhasme, 2018)	technology transfer, knowledge transfer, agricultural extension, model farmers	Model farmers are oftentimes contracted by extension agencies to facilitate technological adoption and, relatedly, the transfer of knowledge to use new technologies. Though such individuals play an increasingly important role in rapidly urbanizing rural environments, particularly in LMICs, model farmers are rarely the subject of critical analysis. This paper examines the ways in which model farmers may disrupt or entrench socio-technological hierarchies and power relations.	Recommendation (solutions-oriented)

Unexpected (in)equities	How We Do Harm: Do Copyrighted Scales Benefit Research in the Developing World?	(Manzar et al., 2019)	copyright, questionnaires, financial barriers, global health	This paper explores challenges with payment for the use of copyrighted questionnaires, particularly given limited budgetary support for research in many LMICs. As a result of demands for compensation, research may be cut short or prevented completely. This paper includes challenges researchers may face related to compensatory requirements and ways to rectify these research (in)equities.	Recommendation (aspirational)
	Breaking Borders: How Barriers to Global Mobility Hinder International Partnerships in Academic Medicine	(Wondimagegn et al., 2022)	international partnerships, visa process, mobility, global research (in)equities	This article describes challenges developing and maintaining international research partnerships because of the visa process, which limits the mobility of academics and researchers, particularly those from LMICs. As a result of what the authors refer to as “social closure,” research may be increasingly dependent on scholars from HICs who have almost barrier-free global mobility.	None (descriptive, problem-oriented)
How administrative infrastructure shape (in)equities	Dreaming partnership, enabling inequality: administrative infrastructure in global health science	(Crane, 2020)	international partnerships, administrative infrastructure, fiscal administration, global health, institutional capacity	This article analyzes the administrative and fiscal infrastructure that structures the global health partnership between the United States and Uganda. Using an ethnographic approach, this article specifically interrogates the fiscal administrative structure to depict how such structures limit Ugandan research and institutional capacity through off-loading potential legal and fiscal risks, which limits the potential benefits of international partnerships.	Recommendation (solutions-oriented)

Author position and order	Reimagining authorship guidelines to promote equity in co-produced academic collaborations	(Miles et al., 2022)	authorship, authorship guidelines, research collaboration, co-production	Authorship can bring numerous benefits for researchers and practitioners, but the ways in which authorship order is decided is often unclear. This article explores what authorship means and how it is understood, including for co-produced research with academic and non-academic partners. Included in this article are suggested modifications for authorship guidelines to equitably address research contributions.	Recommendation (solutions-oriented)
All research is political!	How to identify epistemic injustice in global health research funding practices: a decolonial guide	(Koum Besson, 2022)	global health, funding applications, decolonial approaches, epistemology, ethnocentrism	While epistemic justice approaches have gained in popularity as a way to interrogate structures that lead to the exclusion of marginalized groups, the use of such approaches for funding application review has been limited. Using a decolonial lens based in epistemic justice, this paper presents a three-step approach to reviewing funding applications to ultimately mitigate global health research funding asymmetries.	Recommendation (aspirational)
	Anti-Black racism and behavioral medicine: Confronting the past to envision the future	(Breland and Stanton, 2022)	behavioral medicine, racism, oppression, structural inequity, health equity, systemic change	Behavioral medicine and research have often failed to acknowledge the effects of anti-Black racism, including through slavery, segregation, redlining, and police brutality, and these structural determinants' effects on health. This commentary describes how researchers and practitioners may address anti-Black racism in behavioral medicine, including through the development of structural	Recommendation (solutions-oriented)

				interventions with implications for practice and policy.	
How to think through intersectionality for your research	Incorporating intersectionality theory into population health research methodology: Challenges and the potential to advance health equity	(Bauer, 2014)	intersectionality, population health, research methodology, health research, health equity	Intersectionality theory has the potential to improve understanding of population health, but it has been primarily used in qualitative research. This paper includes seven challenges to incorporating intersectionality into population health research, alongside solutions to conceptualize and plan for research that considers intersectional approaches. Altogether, this article may help improve evidence and policy recommendations tailored to specific communities and/or social contexts.	Recommendation (solutions-oriented)

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