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A scoping review of the health and health-related sustainable development goals (HHSDGs) in Ghana: progress and challenges

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Abstract

Background Sustainable Development Goal (SDG) 3 prioritises the promotion of equitable health outcomes and universal health coverage. In Ghana, there is limited information on the current implementation progress and challenges of the health and health-related SDGs (HHSDGs). The aim of this review was to conduct a situational analysis of the HHSDGs in Ghana whilst providing in-depth and updated literature on their implementation progress and challenges.

Methods We conducted a scoping review guided by the Arksey and O'Malley framework. The Population, Concept and Context (PCC) framework was used to select literature. Peer-reviewed and grey literature with data collected between September 2015 and October 2022 were used. Exclusion criteria included non-HHSDG topics and studies outside the timeframe. Data were retrieved from Scopus, PubMed, Medline, CINAHL, EBSCOhost and grey literature sources. The process yielded 37 peer-reviewed articles and 14 grey literature records, comprising 11 organisational reports from websites, 2 theses, and 1 blog post. Systematic screening, guided by the PRISMA-ScR, and quality appraisal, using the Mixed Methods Appraisal Tool, were performed. Thematic synthesis was employed for the analysis of the data.

Results Health and wellbeing (SDG 3), climate change and climate action (SDG 13), gender equality (SDG 5), zero hunger (SDG 2), and clean water and sanitation (SDG 6) were the identified HHSDGs. Mental health emerged as a key HHSDG, although not a stand-alone SDG. Our review indicates that Ghana has made progress in meeting some critical HHSDG targets, with further work needed to meet all targets. Ghana has made important progress toward the HHSDGs, including improvements in infectious disease control, access to clean water, gender equality initiatives, and the adoption of health innovations. Also, Ghana has significantly reduced the prevalence of overweight in children underfive. However, significant gaps remain in maternal and child health, mental health, sanitation, universal health coverage, and food security. These gapsare driven by persistent structural and socioeconomic barriers.

Conclusions These findings highlight the need for strengthened policies and targeted interventions to accelerate Ghana's progress toward achieving the HHSDGs by 2030.

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Keywords HHSDGs, HRSDGs, Ghana, LMIC, Mental health, Climate change, Gender equity

Introduction

A more comprehensive and ambitious global agenda aimed at achieving the 17 United Nations (UN) Sustainable Development Goals (SDGs) by 2030 [1] followed the 2000–2015 Millennium Development Goals (MDGs) [2]. Generally, these global goals aim to promote global socio-economic development and maintain sustainable structural ecosystems. However, global attention has shifted away from SDGs in recent years due to the COVID-19 pandemic and its effect on global economies, especially those in Sub-Saharan Africa (SSA). In effect, the pandemic exposed the fragilities in global sustainability systems and the gaps in the in the interconnectivity of the SDGs [3–9]. There is a need to realign and refocus to get on track with plans to successfully reach targets. The concept of health is expressively represented in this global agenda, reinforcing the World Health Organization's (WHO) scope of health to promote complete physical, mental, and social well-being [10]. Broadly, the primary health-related SDG (HRSDG), SDG3, promotes the well-being of individuals by focusing on key socio-demographic and health indicators. This goal addresses global maternal mortality, preventable deaths among newborns and children under five years, preventable epidemics of infectious and non-communicable diseases (NCDs), and substance abuse (SDG 3.1–3.D) [11]. In addition, SDG 3 seeks to strengthen global health systems and enhance the implementation of intervention programs in high-risk settings. Achieving universal health coverage (UHC) and access to equitable and quality health care form the policy basis for attaining this goal [12]. Though SDG 3 is a stand-alone health goal, its link to other SDGs such as clean water and sanitation (SDG 6), action against climate change (SDG 13), quality education (SDG 4), poverty reduction (SDG 1), gender equality (SDG 5), zero hunger and good nutrition (SDG 2), sustainable, affordable and clean energy (SDG 7), and safer/sustainable cities and communities (SDG 11) cannot be overemphasized. Integrating the health and health-related SDGs (HHSDGs) is crucial for achieving the intended targets and addressing challenges from trade-offs.

This scoping review provides a baseline national situational analysis of the HHSDGs in a Ghanaian context, whilst providing in-depth and updated literature on the implementation progress and challenges of the HHSDGs.

Methods

Study framework

The methodological foundation of this review was built on the framework for evidence synthesis developed by Arksey and O'Malley, 2005 [13] and further advanced by Levac et al., 2010 [14]. These included five foundational stages: Identifying the research question (Stage 1), searching for relevant studies (Stage 2), screening and selecting eligible studies (Stage 3), data charting (Stage 4), and collating, summarising, and reporting results (Stage 5) [14].

Research question

The review aims to address the research question: What progress and challenges are reported regarding the implementation of the various HHSDGs in Ghana?

Inclusion criteria

The Population, Concept, and Context (PCC) framework informed the development of the inclusion criteria for this scoping review. Table 1 which entails the PCC framework illustrates the eligibility of research articles or reports for the review. This reveals the main concepts and contextualises the literature search [15]. The review included all peer-reviewed and grey literature records collected between September 2015 and October 2022 on the progress and challenges of HHSDG in Ghana.

Exclusion criteria

We excluded published and unpublished studies for which the data collection period was not explicitly stated or fell outside the period from September 2015 to October 2022. Studies and documents reporting on non-HHSDGs were also excluded. Reviews, letters to editors, and records published in languages other than English were also excluded.

Literature search

Search strategy

The Joanna Briggs Institute (JBI) three-phase search strategy was utiliszed in this review [15]. The search strategy aimed to find both published and unpublished studies. An initial limited search of Scopus and Cumulative Index to Nursing and Allied Health Literature (CINAHL) was undertaken, followed by analysis of text words contained in the title and abstract, and of the index terms used to describe the article. A second search was conducted using all identified keywords and index terms across Scopus, PubMed, Medline, and CINAHL. Thirdly, the reference lists of all identified articles and reports that met the inclusion criteria of the review were searched for additional articles or reports. A manual supplementary search (hand search) was also done to identify further relevant articles or reports that were not captured through automated database searches. We reviewed the reference lists and bibliographies of the records included in the

Table 1 Population, Concept, and Context (PCC) framework

Population	All populations (individuals of all ages and sexes)
Concept	HHSDG implementation, progress, and bottlenecks
Context	Any geographical setting in Ghana

study to ensure that no important studies were missed. Articles or reports in the English language were considered for this review since the official language of Ghanaians is English. Hence, the potential of language bias is limited. Data from studies launched between September 2015 and October 2022, following the SDGs, were considered for this review.

Information sources

The electronic databases searched include Scopus, PubMed, Medline, and CINAHL. Grey literature (unpublished studies) information sources include the WHO website, UNICEF website, Non-governmental Organisations websites, UG space, Google, Google Scholar, and EBSCOhost. The search details have been outlined in Supplementary Table S1.

Screening and selection of eligible articles

Following the search, all citations (both published and unpublished data) that met the inclusion criteria for the review were collated and uploaded into EndNote 20 software to de-duplicate citations by automation. All citation details were exported to Rayyan Qatar Computing Research Institute (QCRI) review manager for screening and selection of articles [16]. Following a pilot test, titles and abstracts were screened by two independent reviewers for assessment against the inclusion criteria of the review. We removed additional duplicates through automation and manual comparison of titles. Two independent reviewers also assessed full-text articles that met the inclusion criteria. Reasons were provided for full-text articles that did not meet the inclusion criteria and were excluded. Any disagreements that arose between reviewers at any stage of the selection process were resolved through discussion or with the assistance of a third reviewer. The results of the search were reported in full in the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Extension for Scoping Reviews (PRISMA-ScR) flow chart [17].

Quality appraisal

All citations that met the inclusion criteria of the review were critically appraised for methodological quality by two independent reviewers. Piloting was conducted using standardised appraisal tools, and any disagreements between reviewers that arose during the critical appraisal process were resolved through discussion or with the assistance of a third reviewer. The quality of the peer-reviewed studies was appraised using the Mixed Methods Appraisal Tool (MMAT) version 2018 [18]. For each study, we identified its methodological category (qualitative, quantitative descriptive, quantitative non-randomised, quantitative randomised, or mixed methods) based on the guidance provided in the MMAT manual. Each study was then appraised using the five corresponding MMAT criteria for its category. For every criterion met, a score of 20% was assigned, yielding a total possible quality score ranging from 0 to 100%. The overall quality scores were calculated and classified according to the level of quality of evidence as follows: weak (≤ 50%), moderately weak (51–65%), moderately strong (66–79%), or strong (80–100%) [18]. The overall quality score of the studies ranged between 20 and 100%. An average overall quality score of 90% was recorded. Thirty-one (31) studies had a quality score of 80–100% [19–49]. Three (3) studies scored 60% average [50–52], whereas the remaining three studies had an average of 20% [53–55].

The quality of the grey records was evaluated using the Authority, Accuracy, Coverage, Objectivity, Date, and Significance (AACODS) evaluation and critical appraisal tool [56]. This tool evaluates the quality of grey information guided by the Authority, Accuracy, Coverage, Objectivity, Date, and Significance checklists. It was scored 90–100% (Excellent quality), 80–89% (Good quality), 70–79% (Moderate quality), and below 70% (Poor quality) [56]. Of the 14 grey records included in the review, 10 had a 90–100% quality score [57–67]. One (1) record had a 40% quality score [68] and the remaining 3 had an average of 60% quality score [69–71].

Data charting

The relevant studies included were charted using the following characteristics and domains: author & year of publication, study design, study population, and HHSDG discussed, HHSDG implementation progress, challenges established, and other significant findings.

Collating, summarizing, and reporting results

The results were presented according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Extension for Scoping Reviews (PRISMA-ScR) flow chart [17]. These are shown in Fig. 1.

Results

Characteristics of eligible articles

Supplementary Table S2 describes the eligible peer-reviewed studies and grey literature included in the review. The majority of the studies/reports (20) were conducted at the national level (6 peer-reviewed articles and 14 grey literature reports) (Fig. 2) [23, 30, 37, 46, 53, 54, 57, 59–71]. The year of publications ranged from 2017–2022 and 2016–2023 among the peer-reviewed articles and grey information respectively (Fig. 3). Most literature

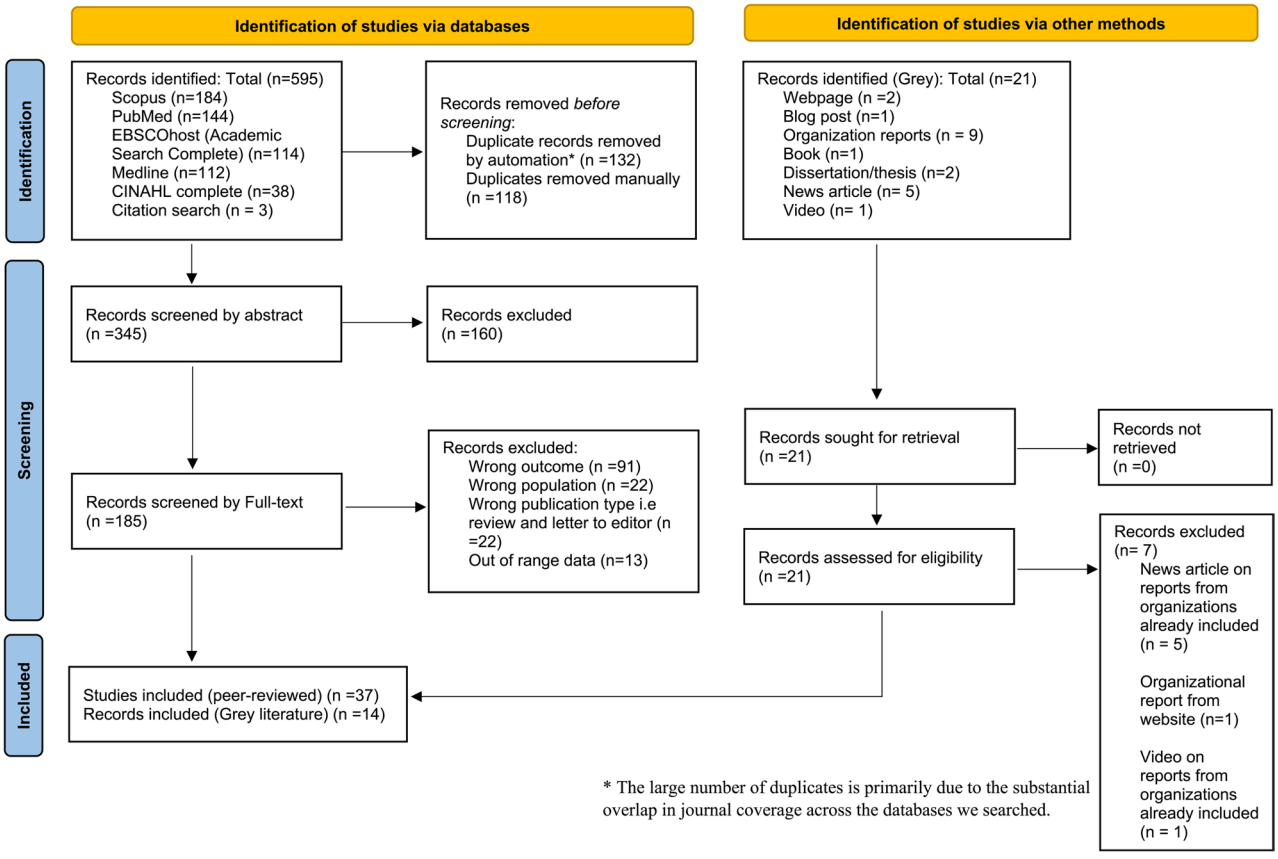

Fig. 1 PRISMA-ScR flow chart of literature search and identification of eligible studies and records

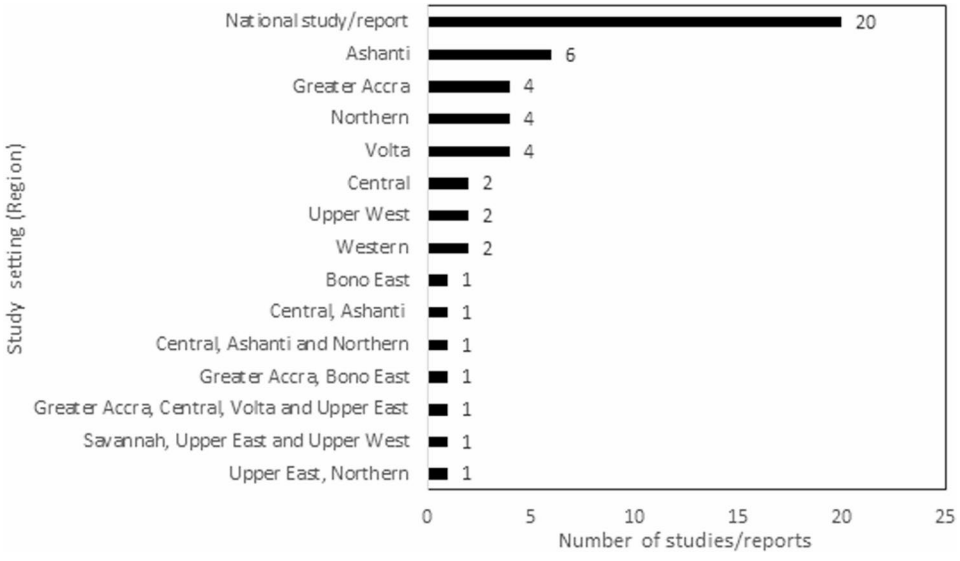

Fig. 2 Distribution of eligible peer-reviewed articles by study setting

fell under SDG 3 (19 peer-reviewed studies and 10 grey records) [19–24, 26, 32, 35, 36, 40, 45–48, 50, 53, 57–63, 65, 67, 68] (Fig. 4). A total of 22 peer-reviewed articles reported on the progress of HHSDG only [19, 28–36, 39, 41, 43, 44, 46, 47], 7 reported on the challenges only [20, 23, 24, 37, 38, 40, 52] and 8 reported on both progress and challenges [21, 25–27, 42, 45, 48]. Two (2) grey records reported on HHSDG progress only [59, 67], 2 reported on challenges only [69, 70], and 10 reported on both [57, 60–66, 68, 71].

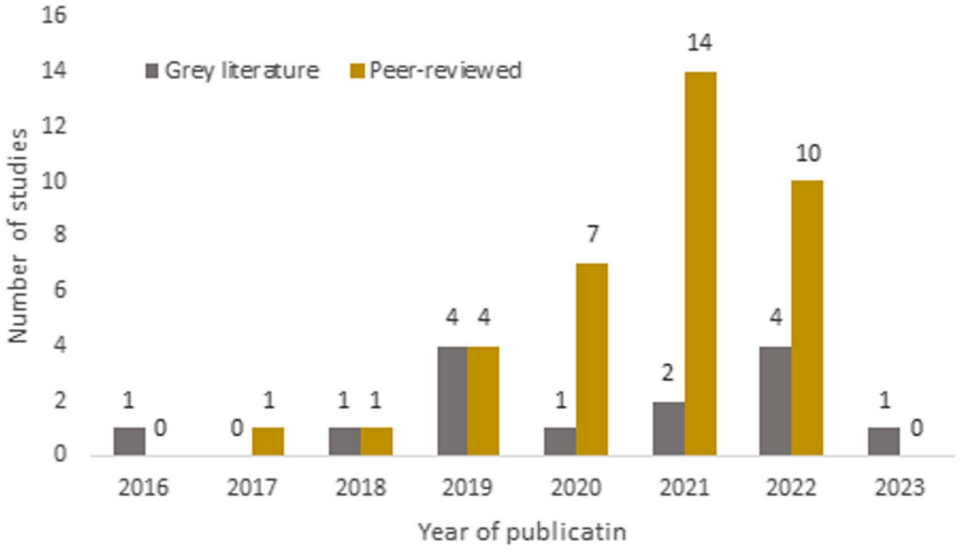

Fig. 3 Distribution of eligible articles by year of publication

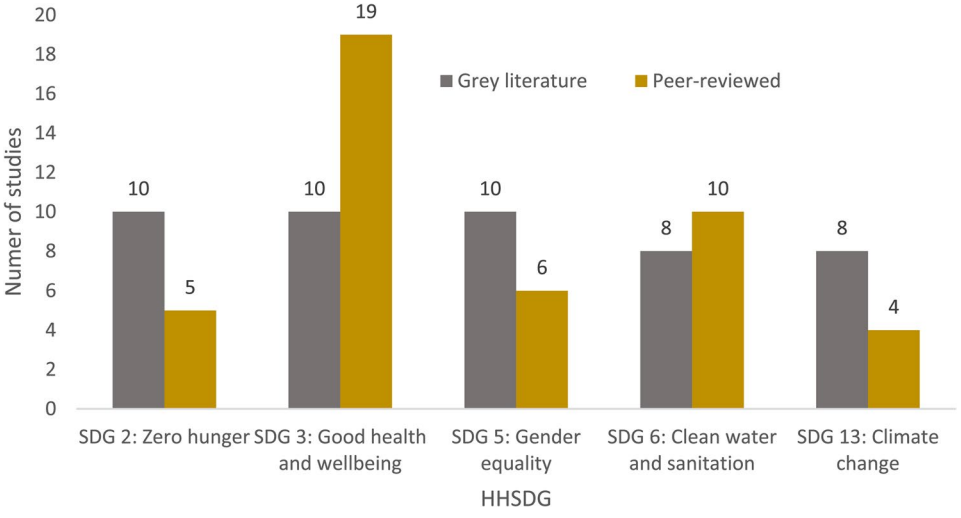

Fig. 4 Distribution of eligible studies by HHSDG

Summary of included reports

This review summarises the progress achieved and barriers impeding the advancement of the HHSDGs targets in Ghana. The findings of all included articles are summarised in Supplementary Tables S3 and S4 (Appendix 1). A thematic summary of Ghana's implementation status of the HHSDG, highlighting specific indicators including mental health, climate change, gender equality, food and nutrition, water and sanitation, and general health and wellbeing described. Generally, most of the studies included were national-level studies (n = 20) (Fig. 2). As presented in Fig. 4, five (5) HHSDGs were reported in this review, namely SDG 2 (Zero hunger), SDG 3 (Good health and wellbeing), SDG 5 (Gender equality), SDG 6 (Clean water and sanitation), and SDG 13 (Climate change). The majority of the studies included in the review reported on SDG 3 (n = 29) of which 19 were peer-reviewed articles and 10 were grey reports. Overall, 24 studies reported on the progress of HHSDG implementation in Ghana, and 9 studies focused on the challenges. Furthermore, 18 studies reported on both the progress and challenges of HHSDG in Ghana. These are demonstrated in Fig. 5.

Discussion

This scoping review summarizes the literature on the progress of the HHSDGs in Ghana, highlighting milestones and the challenges hindering their implementation. It provides the necessary baseline information to scale up the implementation of HHSDGs in Ghana systematically.

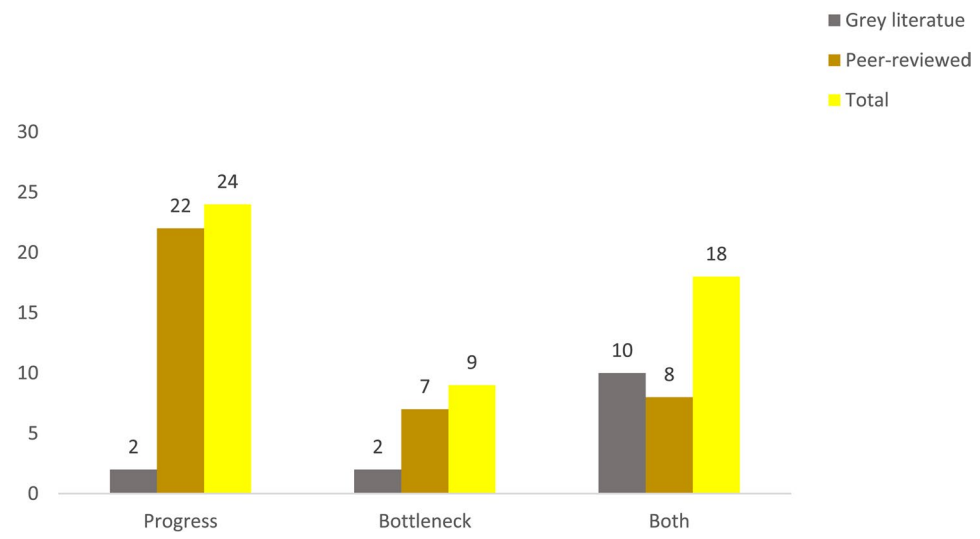

Fig. 5 Distribution of studies on HHSDG Progress and Challenges

Health and wellbeing (SDG 3)

SDG 3 has been widely documented in Ghana as its implementation seeks to promote good health and well-being among populations. Of these documents, several reported on the progress of SDG 3 [19, 21, 22, 26, 28, 29, 32, 35, 36, 45–49, 53, 57–63, 65, 67, 68, 71]. Similarly, others reported on the challenges hindering the successful implementation of SDG 3 in Ghanaian populations [20, 24, 40, 45, 48, 49, 57, 60–63, 65, 68–71]. These documents reported on Ghana's progress and challenges in implementing SDG 3, particularly in life expectancy, maternal and neonatal health, health technology and innovation, mental health, infectious diseases, healthcare accessibility and universal health coverage, health financing, and health insurance.

Life expectancy

The current life expectancy at birth in Ghana ranges from 55.3 to 66.3 years [58, 67], which is lower than the global life expectancy of 71.7 years as of 2022 but exceeds the overall life expectancy in Africa (62 years) [72, 73]. This may reflect the health and wealth inequalities in these settings. Arguably, high-income countries have a higher standard of living than developing and poor countries, primarily reflecting access to effective health systems and facilities, as well as fundamental determinants of health, including water, sanitation, and hygiene (WASH) infrastructure, health literacy, and psychosocial well-being, among others [74].

Maternal and neonatal health

Maternal and neonatal health are paramount in Ghana's healthcare system; hence, a majority of the documents included in this review evaluated their implementation across different indigenous settings [36, 57, 59, 60, 63, 67]. Overall, these evaluations established Ghana's progress in maternal health-seeking behaviours, the use of skilled birth attendants, and antenatal health services [36, 57, 60, 63]. SDG 3.2 targets to reduce maternal mortality to at least 70 per 100,000 live births, neonatal mortality to as low as 12 per 1,000 live births, and under-5 mortality to at least as low as 25 per 1,000 live births by 2030 [75]. However, Ghana has stagnated and struggles to meet this target. Specifically, neonatal mortality prevalence in Ghana ranges between 2.8% and 6.1% with an absolute rate of 22.9–27.0 per 1000 live births [59, 60, 67]. Under-five mortality stands between 44.7 deaths per 1000 live births and 61.4 per 1000 live births [59, 60, 63, 67], and maternal mortality rate stands between 301–310 per 10,000 live births [57, 59, 60, 63, 67]. The WHO strongly recommends at least 4 antenatal care (ANC) visits, management and delivery by skilled birth attendants, and receipt of first postnatal care (PNC) within the first 24 h after birth [76]. Though Ghana largely meets these requirements [57, 60], there are records of health inequalities, poor health-seeking behaviors, and inappropriate sociocultural practices that contribute to these deaths.

About 93.3% of pregnant women deliver in health facilities, and 79.9–91.5% utilised the services of skilled birth attendants [57, 60]. Also, inappropriate postnatal practices such as the use of enemas, cord care with cow dung, and herbal baths, as well as poor health-seeking behaviours of mothers and caregivers, contributed to the rise in neonatal mortalities in some state jurisdictions, particularly the Upper West region of Ghana [36]. Bottlenecks recorded included insufficient healthcare facilities, poor funding of healthcare facilities, and shortage and inequitable distribution of healthcare professionals [57, 60, 63].

Infectious diseases

A number of the reports demonstrated Ghana's progress and challenges in eliminating specific infectious diseases, including HIV/AIDS, Tuberculosis, and malaria [47, 57, 59, 60, 63, 67]. New HIV infections declined from 20,323 (2016) to 17,580 (2020), with the rate declining from 0.71 per 1,000 (2016) to 0.57 per 1,000 uninfected population (2020). TB incidence declined from 48.5 per 100,000 population (2019) to 40.2 per 100,000 population (2020), and malaria incidence reduced from 341 per 1,000 population (2018) to 186 per 1,000 population (2020) [67, 77]. Furthermore, Ghana's response to the COVID-19 pandemic was widely considered successful, with a swift increase in PCR testing capacity from 2 to 15 sites early on, a Track-Test-Treat strategy, and low case fatality [78]. Although progress has been reported [47, 57, 59, 60, 63], some challenges hinder the implementation of programs aimed at eliminating these diseases [57, 60, 63]. A study to assess students' knowledge and attitudes on HIV/AIDS and HIV testing in Ghana demonstrated good knowledge about HIV/AIDS and HIV testing among the students [47]. However, the students demonstrated negative attitudes and feelings toward HIV testing and counseling [47]. Also, the national HIV elimination goals require acceleration. Demographically, new HIV infections among 0–14 years and 15–24 years populations stand at 2.6 and 5.6 per 1000 uninfected population respectively [60]; new HIV Incidence in children under five stands at 0.88 per 1000 population; new HIV incidence in girls 15–19 years: 1.18 per 1000 population and new HIV incidence in boys 15–19 years: 0.1 per 1000 population [59]. Likewise, the TB incidence in Ghana stands between 40.2 and 143 per 100,000 population [60, 63, 67].

Contrary to the documented progress, the inequitable distribution of health professionals, inadequate health facilities, poor counseling, budgetary incredibility, lack of data on budgetary expenditure, poor data and information management, and the emergence of the COVID-19 pandemic stall the goal of eliminating these infectious diseases [60, 63, 69, 70].

Mental health

Mental health issues were subtly represented in Ghana's SDG reports as illustrated in Fig. 5. Three (3) of forty-two (42) SDG 3 documents reported on mental health issues [19, 32, 59]. Among persons aged 6–19 years, mental health disorders stood at 4.2% [19], whereas 51.8% of female caregivers aged 15–59 years who provided care to children aged 13 years and younger suffered at least one mental health condition [32]. These included depression (25.2%), anxiety (53.3%), stress (9.7%), and comorbidities with all three mental health conditions (8.3%) [32]. On the other hand, psychosocial well-being among children aged 36–59 months stood at 68.4% which requires acceleration [59]. Mental health issues are under-represented in Ghana due to the limited literature profiling the progress and challenges reported. Generally, the limited information available suggests the need to accelerate mental health care in Ghana.

Healthcare accessibility and universal health coverage

Access to healthcare, as a crucial indicator for achieving universal health coverage, was adequately evaluated in this review [20, 21, 23, 26, 46, 49]. This review documented physical barriers to accessing healthcare in Ghana, including inadequate healthcare facilities, poor road network, lack of transportation, inaccessibility to ambulances [20, 57], and the unequitable distribution of logistics and health personnel [23, 57]. This conflicted with WHO's Universal Health Coverage agenda for access to the full range of quality health services, irrespective of the time, period, and duration of access, location or setting, and the patient's socioeconomic status [12]. Also, in this review, the average general service readiness (GSR) index of overall service delivery points in Ghana stood at 83.4%. In contrast, the specific mean GSR of hospitals was 92.8%, health centers/clinics (78.0%), and CHPS compounds (64.3%) [46]. In this study, the lowest GSR index was recorded at service delivery points in rural settings [46]. In the Kumasi Metropolis, about 18.5% of vulnerable groups were unable to access primary healthcare over the last 12 months [79]. In Northern Ghana, essential diagnostic tests were unavailable according to the WHO's Essential Diagnostics List (EDL) [21]. Specifically, health centers offered 2 of the 20 tests recommended by WHO for facilities without laboratories, whereas rural laboratories offered 12 of the 72 essential diagnostic tests [21]. Other barriers include the high cost of accessing healthcare, transportation challenges, cultural and religious intolerance, and institutional discrepancies such as poor attitudes towards patients, inadequate communication among healthcare workers, and prejudice, among others [20, 49].

Health financing and insurance

Despite GH₵3,055.98 million in core expenditure on SDG 3 in 2017 and GH₵4,402.7 million in budget allocation in 2021 [61, 62], there are records of poor financing for some health facilities to boost their readiness and preparedness to provide health services [23, 26]. At the same time, others blame this on the large disbursement gap by the National Health Insurance Scheme (NHIS) [21]. In most studies, inadequate funding for healthcare access and poor NHIS coverage were reported [26, 45]. NHIS coverage declined from 40% in

2015 to 38.4% in 2016 and to 35.6% in 2017 due to poor funding of the scheme, loss of interest among beneficiaries, poor education, and poor monitoring and evaluation [71]. Studies have evaluated the coverage and effectiveness of the NHIS in Ghana [23, 29, 49]. A study conducted in the Ashanti, Northern, and Central regions of Ghana revealed that about 49.9% of the overall out-outpatients paid out-of-pocket for health services rendered, 46.9% of the insured patients still paid out-of-pocket, 42.0% of the insured poorest quintile paid out-of-pocket, 75% of the insured clients still paid for consultation and 63.2% paid for drugs [29]. In addition, 34.9% of insured patients purchased drugs from outside the health facility they visited due to the unavailability of drugs (67.9%) and drugs not covered by the NHIS (20.8%). On average, patients paid GHS 33.00 (USD 6.6) out of pocket [29]. These were tagged as hidden charges, especially for maternal services, coupled with the non-inclusion of sexual, reproductive health, and rights (SRHR) services [23]. In another study, NHIS-insured vulnerable populations recounted poor service provision under the scheme [45]. Again, the introduction of the capitation policy in Ghana's health insurance negatively influenced maternal health provision [35].

Furthermore, this review summarizes the effect of social intervention programs on access to healthcare in Ghana. For instance, the introduction of the Livelihood Empowerment Against Poverty (LEAP) 1000 increased enrolment among marginalised populations in the NHIS [28]. The LEAP 1000 program, through its premium waivers, boosted adults' likelihood to enroll in NHIS by 18%, children (20%), and women of reproductive age (25%) [28]. However, a study by Agyemang-Duah et al. (2019), found that the LEAP program played a limited role in reducing health poverty among older people enrolled in the program [49]. About 45% of beneficiaries financed their health care mostly with their income [49].

Health technology and innovations

The use of technology-assisted algorithms and platforms in healthcare systems emerged as a sustainable approach to providing real-time access to healthcare, particularly in marginalsied and hard-to-reach settings in Ghana. In April 2019, Ghana launched a medical drone program to improve Ghana's healthcare supply chain [53]. This program employed the services of a global technology company to manage the healthcare supply using artificial intelligence (AI)-enhanced, carbon and noise-free medical drones to ensure real-time delivery of essential medicines, blood, and blood products across the country, especially to hard-to-reach indigenous communities [53]. Ultimately, this development aimed to reduce deaths relating to childbirth, accidents, and snakebites that were endemic in these settings.

Zero hunger (SDG 2)

Ending hunger and malnutrition

Hunger and malnutrition are crucial indicators for evaluating the progress of the HHSDGs among target populations in Ghana, especially among children. The overall prevalence of malnutrition among children aged 6–59 months ranges from 31.2% to 57.3% [80]. This is significantly dependent on the data source used [80], including Survey Data from the Ghana Demographic and Health Surveys (GDHS), the Ghana Multiple Indicator Cluster Survey (GMICS), and the emerging Ghana Socioeconomic Panel Survey (GSPS).

According to the SDG trackers, Ghana is on track in fighting stunting among children under five years old and has met the global target for overweight among children under five years old; however, acceleration is needed to meet the wasting target [57, 59, 60, 63, 67]. Similarly, significant progress has been made in children's nutrition. Childhood undernutrition has declined from 47.3% in 1990 to 6.1% in 2019 [58, 67]. Exclusive breastfeeding for six months declined in Ghana from 45.7% in 2011 to 42.9% in 2017 [63].

Improving agricultural productivity and food production

High import duties on agricultural inputs contribute to low agricultural productivity and poor investment [60]. However, the government has made progress by investing GH₵833.73 million in 2018 and budgeted GH₵1196.87 million for the Agricultural Ministry [61, 62]. Also, the Government of Ghana introduced flagship programs such as the Planting for Food and Jobs, Rearing for Food and Jobs, Planting for Exports and Rural Development, Greenhouse villages, One Village One Dam, the Ghana Agricultural Sector Investment Program, and Agricultural Mechanisation [61, 62, 64, 68]. Food insecurity in Ghana stood at 49.5% in 2017, with the Central (70%), Upper West (79%), Northern (80%), and Upper East (80%) regions most affected [57].

There are reports of scarcity of food commodities. The African Locust Bean population is declining due to an ageing tree population, challenges in caring for saplings until maturity, agricultural changes with increased mechanisation and pesticide use, overuse of the trees as a source of firewood, and reduced water availability [34]. Other reports highlight poor farming practices, low level of awareness of improved seeds, particularly hybrid seeds, and technologies, and the adoption rate of these technologies especially among the rural farmers, the high cost of seeds, the promise of more yields, poor market access, poor social networks, COVID-19, the absolute control of farmlands and outputs by men and increased population growth as the significant

challenges in fighting hunger and malnutrition in Ghana [38, 52, 57, 61–63, 65].

However, the Agriculture sector produced more than enough in 2020 (7.4%) than its target (6%) [63]. Also, there is evidence of greater reductions in downside risk exposure in farming and higher crop yields through the adoption of climate adaptation strategies such as irrigation, soil conservation, enhanced cropping calendar management, on-farm performance, and the multi-dimensional poverty index [41].

Gender equality (SDG 5)

Gender equality emerged as a major theme across agriculture, health, human rights, education, industry, institutional and governmental representation, and the socioeconomic well-being of marginalised groups, particularly women and girls. Although there is a need for acceleration, Ghana has shown commitment to meeting global gender equality targets. This includes launching national gender policies and amending laws to protect women, girls, and boys; and reserving quotas for girls and women in education and in the leadership of government institutions, respectively [61–63]. This commitment aligns with the global goals for achieving gender equality by 2030 [81]. In 2013, the Ministry of Gender, Children, and Social Protection replaced the Ministry of Women and Children's Affairs, and the National Gender Policy was adopted and launched in 2015 [61]. Also, quota systems continue to be implemented at the tertiary level to enrol a certain percentage of females, together with community sensitisation dialogues for traditional and religious leaders on Child Marriage [62]. Ghana enacted and amended gender-related laws, including the Children's Amendment Act, 2016 (Act 937), Ghana Aids Commission Act, 2016 (Act 938), Right to Information Act, 2019 (Act 989), Land Act, 2020 (Act 1036), and the Real Estate Agency Act, 2020 (Act 1047) to accommodate gender equality [63]. Again, Ghana has seen a significant decline in disparities and abuse against women and children. Evidence shows that rape cases were reduced from 580 (2018) to 504 (2019) to 503 (2020) [63]. Women's parliamentary seats increased from 12.7% (2016) to 13.8% (2019), women in Metropolitan, Municipal, and Districts Chief Executives (MMDCEs) positions increased from 10.3% (2016) to 14.8% (2019) whereas women Ministers of State increased from 10 (20%) in 2018 to 13 (22.4%) in 2019 [57, 60, 63, 67]. This falls at the back of the Presidential flagship initiative to appoint 30% women for government appointment and all public institutions, including the passage of the Affirmative Action Bill to increase women's participation in decision-making at all levels and ranks [64]. Female Supreme Court Judges increased from 26% (2019) to 28% (2020) and 31% (2021) [63].

However, there is a need for acceleration. Defilement cases declined from 1889 (2018) to 1720 (2019) but increased to 1750 (2020) [63]. Child labor among children aged 5–17 years stands at an average of 20.1% intimate-partner violence and abuse among women and girls 15–19 years (23%.) non-intimate-partner sexual violence among women and girls 15–19 years (3%), child marriage stands at 19.3%, female genital mutilation: 2.4%, sexual violence among young women 18–29 years by age 18: 10% and children 1–14 years who experienced violence by caregivers: 94% [57, 59, 60]. Psychological violence peaked at 24.8% among divorced/separated/widowed women compared to 21.3% among married/cohabiting women [60]. Intimate partner and non-partner violence remains a national issue that needs conscious accelerated strategies to address. This review suggests the need to relax the bureaucracies in addressing issues related to gender inequalities, to excite the interest of women to take up leadership roles, and to engage in broader stakeholder consultation and sensitization to fight cultural and religious practices that still promote child marriage and female genital mutilation [57, 65, 66].

A study by Lelea et al. (2022) established the marginalisation of women African Locust Bean farmers in the Northern part of Ghana [34]. The seeds of the African Locust Bean are considered a women's crop and play a significant cultural and economic role in their lives. However, the seeds are mediated by the men and chiefs of the communities, coupled with the skewness and inequality in land ownership, which favors the men [34]. Elsewhere, only 20% of cocoa farm operators or managers were women who only own small land sizes compared to that of men (their land holdings are on average half the size of men's), commonly still expected to work on husbands' farms; however, men control all monetary gains of the farm [38].

A study by Gbagbo and Nkrumah (2022 assessed the availability and implementation of breastfeeding policies and programs in three public universities in Ghana [22]. Though all the Universities included in the study were gender- and child-friendly, none had either a formal breastfeeding and childcare policy and program in place or an immediate policy-guided plan for on-campus facilities to facilitate exclusive breastfeeding due to financial constraints [22].

The non-inclusion of some sexual, reproductive health and rights (SRHR) services, including family planning, abortion, and post-abortion services, within the health benefits package, as well as the fragmentation of support services for gender-based violence victims across agencies, emerged as a significant bottleneck in meeting the SDG 5 goal [23].

Clean water and sanitation (SDG 6)

The United Nations have recognised access to safe and affordable drinking water and sanitation as a human right; hence, SDG target six calls for universal and equitable access to clean water and sanitation [1, 82]. Overall, Ghana has made commendable progress in providing households with access to safely managed drinking water, with about a 6% increase from 80% in 2015 to 86% in 2020 [57]. This agrees with the global estimate of 74% as of 2020 [82]. Specifically, under government- and NGO-led rural water projects, interventions boosted access to potable water from 9.9% in 2013 to 17.9% in 2017 despite the financial burden [60–62]. As of 2019, about 53.6% of schools had access to water, sanitation, and hygiene (WASH) infrastructure [59]. Rural water services increased from 9.9% (2013) to 17.9% (2017) [60].

The Government of Ghana has demonstrated a commitment to meeting communities' safe water demands. The Ministry for Water and Sanitation was established in 2017 with a core expenditure of GH₵126.9 million to oversee this goal [61]. Again, the government instituted its flagship programs, dubbed the "Water for All" program, construction of a fecal sludge management infrastructure, the Community-Led Total Sanitation Program, and the "Toilet for All" Agenda project, under the Ministerial budget allocation of GH₵750.40 million [62]. These programs require a significant financial commitment due to the high implementation costs. According to a survey, the cost of achieving full water coverage in the Bongo, East Gonja, and Wa East communities in the Northern part of Ghana was USD 10,342,190, USD 15,828,421, and USD 10,111,616, respectively [55]. However, in a household survey, access to an adequate water supply was not necessarily dependent on the physical location of house units, but rather on factors such as the lack of a building permit, financial constraints, rental conditions, administrative procedures, and ill-suited housing arrangements [83].

Worryingly, records show that human activities pose significant challenges to the depletion or contamination of waterbodies. According to available evidence, artisanal and small-scale mining methods, including alluvial, surface/open pit, and underground mining, have negative impacts on water resources [39]. In addition, access to household and community sanitation infrastructure is a key indicator in estimating and describing the sanitation situation in household surveys in Ghana. A study by Foggitt et al. (2019) estimated that 56% of households had at least one toilet facility in the Ashanti region [27]. In contrast, other reports reported that between 13.3% and 23.7% had access to basic sanitation services [57, 59, 60, 67]. However, according to Cobbinah et al. (2020), 57.1% had no access to safely managed sanitation infrastructure and services [42]. Whereas access to household toilets increased from 46% in 2010 to 59.3% in 2021, access to public toilets declined from 35% in 2010 to 23% in 2021 [63]. Open defecation is a challenge in Ghana, with prevalence ranging from 9.9% to 44.2% [19, 51, 57, 59, 60], commonly in rural communities (32%) [57]. The detrimental effects of poor sanitation on health, such as the outbreak of diarrheal diseases, including cholera and malaria, particularly among children, make SDG 6 a crucial HHSDG that needs acceleration in Ghana. For example, in 2016, there was a protracted cholera outbreak in the Central Region, affecting 704 individuals between October 2017 and January 2017, and with broken sewage pipes and open defecation observed at the epicentre [84].

Lack of education and poor information management regarding proper water preservation and sanitation measures have been shown to influence negative behavioral perceptions and attitudes among populations. In a qualitative study conducted in Elmina, some fisher folks were not willing to pay for waste collection services, citing poverty as the main reason [43]. Most of them resort to dumping waste on the street, into drains, the lagoon, and the sea. While the fisher folks were aware that indiscriminate waste disposal led to diseases such as malaria and cholera, they were oblivious to its impact on aquatic resources. Also, in a household survey in Accra and Sunyani, tenants frequently dispose of non-fecal matter such as sanitary pads and diapers (38.5%), fabrics/rags (23.2%), toilet rolls (20.8%), and razor/shaving sticks (10.3%) into fecal sludge [25]. These routine practices were influenced by behavioral perceptions such as fear of exposing used sanitary materials for rituals, the use of fabric as an alternative to toilet rolls, and the desire to conceal aborted pregnancies from the public.

Sewage treatment systems have been deployed to reduce bacterial contamination of downstream surface waterbodies. For example, in a sewage treatment plant in Accra, there were reductions of 99.9%, 98.8%, and 99.5% in the E. coli, A. hydrophila, and P. aeruginosa concentrations, respectively, in the effluent at the treatment plant's exit [33]. Also, this reduced antibiotic resistance for tetracycline, ciprofloxacin, cefuroxime, and ceftazidime.

Climate change and climate action (SDG 13)

Climate change issues were adequately represented in this review. This covers information management, the use of technology, state interventions, policy interventions, and agricultural adaptation strategizing.

Ghana has developed measures to fight climate change. In 2019, Ghana launched an AI-assisted medical drone program with zero-carbon emissions to deliver medical supplies to remote communities [53]. Ghana produces a total of 42.2–58.56 MtCO2e of greenhouse gases [57, 63], with 0.5 tCO2/capita from fossil fuel combustion and cement production [67]. In agriculture, Ghana has adopted climate change adaptation strategies such as irrigation, soil conservation, enhanced cropping calendar management, on-farm

performance, and the multi-dimensional poverty index, which reduced downside risk exposure and increased crop output [41]. Ghana subscribed to a national disaster risk reduction strategy by becoming a member and signatory to the UN Framework Convention on Climate Change [57]. Also, Ghana has developed strategic climate change documents such as the National Climate Change Policy, National Climate Change Master Plan, Implementation Plan for Nationally Determined Contributions (NDC), Investment & Implementation Plan, National Climate Change Adaptation Strategy, 2016 National Reducing Emissions from Deforestation and Forest Degradation (REDD+) Strategy, 2016–2040 National Forestry Plantation Strategy and the 2018–2021 Medium-term Development Policy Framework [60, 61]. In addition, climate change has been integrated into the learning curriculum of primary and secondary schools and introduced to public universities to enhance behavioural change [60]. In 2021, Ghana launched the updated Nationally Determined Contributions, along with a Climate Change Public Expenditure and Institutional Review. Despite GH₵121.69 million expended in 2017 and GH₵166.20 million allocated to climate change in 2021 [61, 62], the review revealed that the majority of government expenditure went into agriculture, water, and sanitation policies, rather than on climate action [62, 65].

Ghana is making good efforts on climate action despite major challenges, including low awareness of climate change among policymakers, poor human institutional capacity, poor or no data on climate change, low prioritisation of climate information services, poor funding, low appreciation of the vulnerability status of various local assemblies, and high budget incredibility [37, 57, 66, 69, 70].

Strengths

This review provides a broad and systematic overview of Ghana's progress, offering a holistic picture by including data on both health and health-related SDGs, highlighting the interplay between health, environment, gender, and economic factors. This study adhered to strict inclusion criteria and a specific study context. We performed a transparent and reproducible data search that included studies and reports specific to Ghana from online databases and platforms. The paper identifies key gaps and provides recommendations and future research needs. Furthermore, the country-level focus is timely as we approach the SDG target year 2030, as it provides evidence to support re-evaluation and alignment of national policies and their translation.

Limitations

Though this study employed a comprehensive and systematic approach to data extraction, some grey literature may have been inadvertently missed if not uploaded on accessible online databases or repositories. These may have included reports from state institutions, civil society/non-governmental organizations (CSOs/NGOs), and universities and could have resulted in publication bias. Additionally, although Ghana is an Anglophone country, it is possible that some relevant publications written in French and pertaining to Ghana were missed, as this review included only English-language sources. Furthermore, most of the records in the review failed to establish the real-time progress of HHSDGs in Ghana since the data available were mostly up to the year 2020. Finally, this review omitted the optional sixth stage of the Arksey and O'Malley evidence synthesis framework, as enhanced by Levac et al., which involves consultation with relevant stakeholders to refine the research question, interpret findings, and facilitate knowledge translation. Future studies could address this gap by integrating stakeholder engagement to strengthen the relevance and uptake of findings.

Implications for future research and recommendations

This baseline assessment critically examines the progress made and the challenges impeding the implementation of the HHSDGs in Ghana. The findings highlight several key areas that require further investigation to enhance the understanding and effectiveness of HHSDG implementation. The identified gaps, recommendations and research needs are summarized in Supplementary Table S5.

Conclusions

This scoping review provides a comprehensive overview of Ghana's progress toward achieving the Health and Health-Related Sustainable Development Goals (HHSDGs), highlighting both notable advancements and persistent challenges across key sectors. While Ghana has made measurable gains in areas such as infectious disease control, maternal health service utilisaation, access to safe drinking water, gender equality initiatives, and the adoption of innovative technologies, significant gaps remain in meeting global targets for maternal and child health, mental health, sanitation, universal health coverage, and food security. Structural barriers, including inequitable distribution of health resources, financial constraints, sociocultural practices, and limited data systems, continue to impede effective implementation. Overall, the findings underscore the urgent need for strengthened policy commitment, improved financing mechanisms, enhanced data management, and targeted interventions that address regional and socioeconomic disparities. By identifying these gaps and opportunities, this review provides an essential evidence base to guide policymakers, practitioners, and stakeholders in accelerating progress toward achieving the HHSDGs in Ghana by 2030.

Abbreviations

AACODS	Authority, Accuracy, Coverage, Objectivity, Date, and Significance
AI	Artificial Intelligence
CHPS	Community-based Health Planning and Services
EDL	Essential Diagnostics List
GSR	General Service Readiness
HAART	Highly Active Antiretroviral Therapy
HHSDGs	Health and Health-related Sustainable Development Goals
HRSDGs	Health-Related Sustainable Development Goals
LEAP	Livelihood Empowerment Against Poverty
MDGs	Millennium Development Goals
MMDCEs	Metropolitan, Municipal, and District Chief Executives
MMAT	Mixed Methods Appraisal Tool
$MtCO_2e$	Metric tons of Carbon Dioxide equivalent
NCDs	Non-Communicable Diseases
NDC	Nationally Determined Contributions
NHIS	National Health Insurance Scheme
PCC	Population, Concept, and Context
PRISMA-ScR	Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews
REDD +	Reducing Emissions from Deforestation and Forest Degradation
SDG	Sustainable Development Goal
SRHR	Sexual and Reproductive Health and Rights
tCO_2/capita	Tons of Carbon Dioxide per Capita
UHC	Universal Health Coverage
USD	United States Dollar
WASH	Water, Sanitation, and Hygiene
WHO	World Health Organization

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DTD contributed to conception, methodology, supervision, writing, revision and direction of the review. ZAB contributed to conception, coordination, supervision and revision of the manuscript. YAN and OC contributed to conception, methodology and writing. FAJ, FAA and GA contributed to writing, methodology and revision of the work. GAS and ED contributed to writing and revision of the manuscript. RS contributed to the direction, coordination and revision of the manuscript. The Authors read and approved the manuscript.

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