

HEALTH AND HEALTH-RELATED SDGs PROGRESS IN GHANA

PROGRESS REPORT

2023

HEALTH AND HEALTH-RELATED SDGS PROGRESS IN GHANA

PROGRESS REPORT

1.0 Overview

A scoping review using qualitative evidence synthesis techniques conducted in 2022 tracked the implementation progress of health and health-related Sustainable Development Goals (HHSDGs) in Ghana between September 2015 and October 2022. The review aimed to conduct a baseline national situational analysis of the HHSDGs in Ghana whilst providing in-depth and updated literature on their implementation progress and bottlenecks. Of the 51 records reviewed, SDG 2 (Zero hunger), SDG 3 (Health and wellbeing), SDG 5 (Gender equality), SDG 6 (Clean water and sanitation) and SDG 13 (Climate change and climate action) were the identified HHSDGs in Ghana. Generally, Ghana has made significant progress in meeting some HHSDG global targets however, others face major challenges and require acceleration. SDG 2 (Zero hunger) has met some global targets particularly for significantly reducing overweight among children under five years and efforts to further reduce stunting among children under five, are on track. However, progress has stalled for SDG 3 (Health and wellbeing), SDG 5 (Gender equality), SDG 6 (Clean water and sanitation) and SDG 13 (Climate change and climate action). While the COVID-19 pandemic disrupted Global economies leading to reversals in years of progress made through internal and external funding and aid respectively, this review documented significant in-country challenges in implementing HHSDGs in Ghana. These included: poor data tracking and management, poor inter-institutional and inter-ministerial collaboration, rapid population growth and urbanization which interferes with urban planning and sanitation; poor behavioural tendencies among the Ghanaian population, budget incredibility, poor health resourcing and inadequate agricultural mechanized systems.

TABLE OF CONTENT

- 1.0 Overview
- 2.0 Evaluation of HHSDGProgress
- 3.0 Ghana's HHSDG status as of October 2022
- 4.0 Ghana's progressstatus on HHSDG-specific targets
- 5.0 Challenges impedingGhana's HHSDGprogress
- 6.0 Conclusion and
 recommendations for
 achieving HHSDG
 global goals 2030 in
 Ghana

2.0 Evaluation of HHSDG Progress

Figure 2.1 shows the overall progress evaluation of the HHSDGs in percentages based on the cumulative progress of the 5 HHSDGs (SDGs 2,3,5,6 and 13) between September 2015 and October 2022. Generally, less than half (40%) of the HHSDGs are stagnating and or off-track and an additional 40% moderately improving to be achieved by 2030. For example, the SDG 2 and 3 are stagnating whereas 5 and 6 are moderately improving but require acceleration as detailed in Figure 3.1 below. Furthermore, one-fifth (20%) of the HHSDG targets are on track to achieving the SDG goals by 2030.

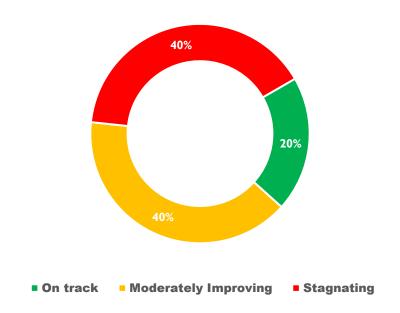


Figure 2.1 Ghana's HHSDG progress as of October 2022

Figure 2.2 illustrates the trend in progress of the five HHSDG goals based on assessed targets. This assessment gives a visual presentation of individual HHSDG progress based on cumulative HHSDG targets and indicators. In a snapshot, close to 10% of SDG 2 targets have been met whereas less than 10% are on track to achieving the SDG goals by 2030. However, more than 50% require acceleration for their targets to be achieved by 2030. Close to 30% of the targets had data gaps. On the other hand, nearly 40% of the targets in SDG 3 and SDG 6 need acceleration to achieve set targets by 2030 based on the available data. However, data insufficiency remains a challenge to adequately evaluate their progress. About 10% of SDG 5 targets are stagnating with an additional 10% of data gaps. However, close to 80% require acceleration.

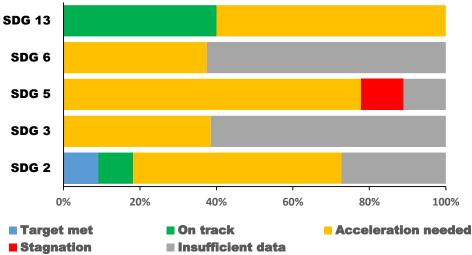


Figure 2.2 Progress assessment for the 5 HHSDG Goals based on assessed targets as of October 2022

3.0 Ghana's HHSDG status as of October 2022

Ghana has made significant progress in implementing the HHSDGs since its launch in 2015. Figure 3.1 summarizes Ghana's HHSDG progress performance by goal as of October 2022. Generally, the HHSDGs related to hunger and sustainable food systems (SDG 2) and health outcomes (SDG 3) are stagnating with major challenges. For example, moderate to severe food insecurity declined from 49.5% in 2017 to 47.7% in 2020 but severe food insecurity increased from 8% in 2017 to 9.5% in 2020 [1]. Similarly, skilled birth attendants visit by pregnant women decreased from 59.1% in 2019 to 58.7% in 2020 [1,2]. In addition, mental health issues are under-represented in SDG progress reports in Ghana largely due to the limited literature profiling the progress and challenges reported at the various levels of healthcare. For example, in the scoping review conducted for this report, only three (3) out of forty-two (42) SDG 3 reports considered issues related to mental health [3–5]. Specifically, this dearth of data may be associated with the unavailability of sustainable data tracking systems and poor information management as described in Table 5.1.1 below. Although gender equality (SDG 5) and clean water and sanitation (SDG 6) are moderately improving, major challenges remain. For example, an existing ministry has been revamped to incorporate gender-related issues, national gender policies launched, and laws amended to protect women, girls, and boys; quotas reserved for girls and women in education and leadership of government institutions [1,6,7]. Similarly, Ghana exceeded the global 74% target of providing access to safely managed drinking water for 86% households in 2020 against the 80% output achieved in 2015 [8]. However, Ghana continue to battle open defecation among 9.9-44.2% of the population [3,5,8–10]. On the other hand, SDG 13 is on track however, challenges impede its progress. For example, Ghana has shown commitment towards climate action by joining global climate action

agreements, engaging in policy interventions and agricultural adaptation re-strategization [1,2]. Also, Ghana tapped into global technological advancements to deploy zero-carbon emission medical drones to supply essential medicines and products to remote communities which conforms with the United Nations' agenda to achieve zero net carbon emissions [11].

Ghana's HHSDG progress performance is comparable with that of the World and Sub-Saharan Africa (SSA) sub-region. The SDG Index and Dashboards report a stagnating SDG 2 with major challenges, moderately improving SDG 3 with some challenges, moderately improving SDG 5 with significant challenges, moderately improving SDG 6 with significant challenges and stagnating SDG 13 with significant challenges at the midpoint of 2030 Agenda [12]. Generally, Ghana's HHSDG progress is on track and synchronized with the global HHSDG Sustainable Development Report [12]. However, Ghana's SDG 3 progress is particularly stagnating and presents major challenges that deviate from the global status on the dashboards. Similarly, the 2023 SDG for SSA reports stagnating SDG 2, SDG 3, SDG 5 and SDG 6 with major challenges [12]. However, SDG 13 is on track with few challenges remaining.

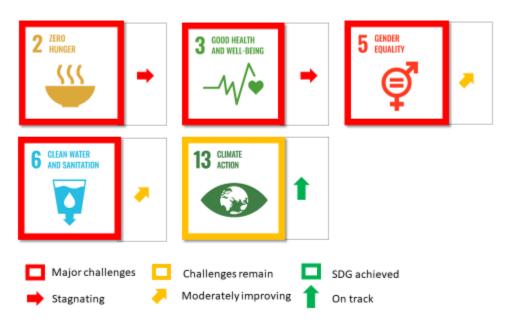


Figure 3.1 Ghana's HHSDG progress performance as of October 2022

4.0 Ghana's progress status on HHSDG-specific targets

Specific HHSDG targets were tracked and progress is reported below:

4.1 Good Health and Wellbeing (SDG 3)

Ghana's progress on the 13 health goals embedded in SDG 3 was tracked and presented in Table 4.1.1 below. The health SDGs 3.1 (Maternal mortality), 3.2 (Child mortality), 3.3 (Communicable diseases), 3.4 (NCD and Mental Health) and 3.8 (Universal Health Coverage Index) have made significant progress, however, some challenges remain and hence require acceleration. This progress is largely influenced by Ghana's health and health-related programs and policies formulated and implemented over the period under review. For example, Ghana launched an Artificial intelligence-enhanced medical drone in the healthcare supply chain in April 2019 [13]. These drones serve as a sustainable healthcare supply chain management system for real-time delivery of essential medicines, blood and blood products to hard-toreach indigenous communities in Ghana. This intervention has significantly reduced the duration of vaccine stockouts and the proportion of people who miss vaccinations by 30% and 44% respectively [14]. Others include the government initiative and action plan for local vaccine production [7]. On the other hand, there was insufficient data to adequately review Ghana's progress on the remaining health goals as outlined in table 4.1.1. Ghana's health progress resonates with the global health status on the SDG progress chart 2023 [15]. Comparatively, Ghana has improved in reducing maternal mortality from 580 per 100,000 live births in 2007 to 301 per 100,000 live births in 2021 with further acceleration needed to meet the target of 70 deaths per 100,000 live births by 2030 [1], whilst the global health maternal mortality progress stagnates [16]. Conversely, Ghana is challenged with data gaps on the health impact of pollution. Tobacco control, substance abuse: research and development for health; health financing and workforce; management of health risks; road traffic accidents; and sexual and reproductive health (Table 4.1.1). Also, the National Health Inusrance Scheme (NHIS) has suffered a decline in population coverage from 38.4% in 2013 to 35.8% in 2018 largely due to poor program financing [17]. However, stakeholder enagagement, education, communication; donor support from developmental parties and efforts to improve accessibility through the mobile renewal system using USSD codes seek to boost coverage [17]. Although poor health financing remains a significant challenge to achieving SDG 3, Ghana made GH\$\psi_3,055.98 million core expenditure as of 2018 [6] and GH\$\psi_4,402.7 million budget was allocated in 2021 [7].

Table 4.1.1 A summary of Ghana's HHSDG progress according to major health goals

Health goals	Status	Data coverage	Source
3.1 Maternal mortality	•	2017-2021	UNICEF, 2023 [5]; Sachs et al, 2022 [2]; NDPC (2020) [8]; NDPC, 2022 [1]
3.2 Child mortality		2017-2020	UNICEF, 2023 [5]; Sachs et al, 2022 [2]; NDPC, 2022 [1]
3.3 Communicable diseases	•	2020	UNICEF, 2023 [5]; Sachs et al, 2022 [128]; NDPC (2020) [8]; NDPC, 2022 [1]
3.4: NCD and Mental Health		2018	UNICEF, 2023 [5]; Kusi-Mensah et al (2022) [3]; Amu et al (2021) [4]
3.5 Substance abuse			
3.6 Road traffic accidents			
3.7 Sexual & reproductive health			
3.8 Universal Health Coverage Index	•	2019	Sachs et al, 2022 [2]
3.9 Health impact of pollution			
3. a Tobacco control			
3. b R&D for health			
c Health financing and workforce	•		
3.d Management of health			
risks			

In addition, the review tracked Ghana's progress using specific health indicators such as life expectancy, health technology and innovations; specific Infectious diseases; healthcare accessibility, universal health coverage; health financing, and health insurance. These are summarized in Table 4.1.2 below. Ghana has made commendable progress particularly by significantly improving access to skilled birth attendants and drastically reducing teenage pregnancy and the proportion of adolescents who give birth annually. However, other health indicators such as Life expectancy at birth, National Health Insurance Scheme (NHIS) coverage, Childhood Immunization, Antenatal care (ANC) coverage, HIV incidence, TB incidence, Malaria incidence and Health innovations /Medical technology require acceleration to meet global targets 2030. Ultimately, it is challenging to rate Ghana's progress in health funding and health infrastructure due to insufficient and unavailable data.

Table 4.1.2 Ghana's health progress according to specific health indicators under review

3 GOOD HEALTH	Health indicator	Status	Data	Source
- ₩•			coverage	
	Life expectancy at birth		2019	Sachs et al, 2022 [2]
	NHIS coverage		2019-2022	Akweongo et al (2021) [18]; Yambah
				et al (2022) [19]; Agyemang-Duah et
				al (2019) [20]; Sheff et al (2020) [21]
	Childhood Immunization		2020	Sheff et al (2020) [21]
	ANC coverage		2020	Sheff et al (2020) [21]; NDPC, 2022 [1]
	Skilled birth attendance		2017-2018	GoG, 2019 [10]; NDPC (2020) [8];
	Chinese shirt atternaunce		2011 2010	UNICEF, 2023 [5]
	Adolescent birth		2018	UNICEF, 2023 [5]
	HIV incidence		2017-2020	GoG, 2019 [10]; NDPC (2020) [8];
				NDPC, 2022 [1]
	New HIV Incidence in		2020	UNICEF, 2023 [5]
	children under five			· · ·
	New HIV incidence in girls			UNICEF, 2023 [5]
	15-19 years			oo, _o_o [o]
	New HIV incidence in boys			UNICEF, 2023 [5]
	15-19 years			,
	TB incidence		2018-2020	GoG, 2019 [10]; NDPC (2020) [8];
				NDPC, 2022 [1]
	Malaria incidence		2018-2020	GoG, 2019 [10]; NDPC (2020) [8]
	Health funding			
	Health infrastructure			
	Health innovations/Medical	•		Damoah et al (2021) [13]; NDPC,
	technology	_		2022 [1]
	● Target met ● On track ● Acc	eleration	needed •St	agnation Insufficient data

The sub-level evaluation demonstrated Ghana's health progress performance stratified by the administrative regions and type of settlements in Ghana (Table 4.1.3). Fifteen (15) out of the new sixteen (16) administrative regions in Ghana have met SDG targets for childhood immunization coverage. However, the Volta region is on track to achieving targets. Urban settlements have met SDG targets for pregnant women to access the services of skilled birth attendants. However, rural settlements are on track to meeting these SDG targets. Similarly, all ten (10) old administrative regions as of 2017 had met SDG targets of supporting pregnant women to give birth under the supervised care of skilled birth attendants. These are towards the broader goal of reducing home deliveries, and maternal and neonatal mortality rates by at least 50% by 2030.

Table 4.1.3 Sub-level evaluation of Ghana's health progress

	Health indicator	Status	Data	Source
_			coverage	
	Childhood immunization		2020	NDPC, 2022 [1]
	coverage (by region)			
	Ahafo			
	Ashanti			
	Bono			
	Bono East			
	Central			
	Eastern			
	Greater Accra			
	North East			
	Northern			
	Oti			
	Savannah			
	Upper East			
	Upper West			
	Volta			
	Western			
	Western North			
	Skilled birth attendance (by		2016-2017	NDPC (2020) [8]
	settlement)			
	Rural			
	Urban			
	Skilled birth attendance (by		2016-2017	NDPC (2020) [8]
	region)			
	Greater Accra			
	Ashanti			
	Brong Ahafo			
	Volta			
	Eastern			
	Western			
	Central			
	Upper East			
	Northern			
	Upper West			

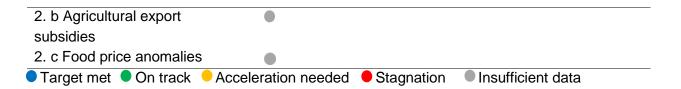
4.2 Zero Hunger (SDG 2)

Table 4.2.1 summarizes Ghana's progress in ensuring food security, and fighting hunger and malnourishment. Overall, Ghana has made good progress in efforts to meet SDG 2 nutritional goals. Ghana is on track to reducing stunting among children under 5 and the target met for fighting child overweight thus 2.9% as of 2020 [5]. However, acceleration is required to meet global targets for drastically reducing undernourishment and ensuring food security; reducing malnutrition and wasting among children under 5; enabling small-scale food producers to invest in sustainable and mechanized agriculture. There is insufficient data to track Ghana's progress on genetic resources for agriculture, agricultural export subsidies and food price anomalies. Ghana's SDG 2 progress was built on core government programs and interventions. For example, key national programs and government initiatives such as Planting for Food and Jobs, Rearing for Food and Jobs, Planting for Exports and Rural Development, Greenhouse villages, the Ghana Agricultural Sector Investment Program and Agricultural Mechanization were launched between 2016 and 2020 [7,22]. In 2017, the Girls' Iron and Folic Acid Tablets Supplementation (GIFTS) program and the Micronutrient Powder Initiative were introduced as a school-based program to fight anaemia and to improve nutrition among menstruating girls 10-19 years [1]. On SDG 2 financing, Ghana made GHCC833.73 million core expenditure in 2018 [6] and GHC1196.87 million budget allocation in 2021 [7].

Table 4.2.1 A summary of Ghana's HHSDG progress according to major nutritional goals

2 HUNGER	
(((

Nutritional goals	Status	Data coverage	Source
2.1 Undernourishment and	•	2016-2022	Nanewortor et al (2021) [23]; Lelea
Food Security			et al (2022) [24]; Sachs et al, 2022 [2];NDPC (2020) [8]; NDPC, 2022 [1]; Sachs et al, 2022 [2]
2.2 Malnutrition	•	2017-2020	UNICEF, 2023 [5]; NDPC (2020) [8]; GoG, 2019 [10]; NDPC, 2022 [1]; Sachs et al, 2022 [2]
2.2.1 Stunting among children under 5	•	2020	UNICEF, 2023 [120]; Sachs et al, 2022 [2]; NDPC (2020) [8]
2.2.2 Wasting among children under 5	•	2017	UNICEF, 2023 [5]; Sachs et al, 2022 [2]
2.2.3 Overweight among children under 5		2020	UNICEF, 2023 [5]
2.3 Small-scale food producers	•	2022	Lelea et al (2022) [24]
2.4 Sustainable agriculture2.5 Genetic resources for agriculture	•	2021	Issahaku et al (2021) [25]
2. a Investment in agriculture	•	2018-2021	MoF, 2018 [6]; MoF, 2021 [7]



The review established Ghana's sub-group progress of SDG 2 (zero hunger) according to the type of settlement and regional progress performance. These are demonstrated in Table 4.2.2. Food security targets are on track in urban communities whereas rural communities continue to stagnate. Greater Accra, Ashanti and Brong Ahafo regions as captured under the old administrative regional system are on track to achieving SDG 2 targets of ending hunger and ensuring food security by 2030. However, acceleration is required for Volta, Eastern, Western and Central regions to attain food security. On the other hand, three (3) regions in the Northern part of Ghana (Upper West, Northern and Upper East regions) are stagnating towards achieving food security. Stratified by sex, SDG 2 targets aimed at reducing stunting to 10% among children under 5 have been met among females while males need acceleration. Similarly, urban dwellers have met the SDG targets for stunting whereas rural settlements require acceleration. Stunting reduction is on track in the Greater Accra region but stagnating in the Northern region of Ghana.

Table 4.2.2 Sub-level HHSDG progress of nutritional goals



Nutritional goals	Status	Data coverage	Source
Food security (by settlement)		2016-2020	NDPC (2020) [8]; NDPC, 2022 [1]
Rural	•		, , , <u>, , , , , , , , , , , , , , , , </u>
Urban			
Food security (by region)		2016-2020	NDPC (2020) [8]; NDPC, 2022 [1]
Greater Accra			
Ashanti			
Brong Ahafo			
Volta			
Eastern			
Western			
Central			
Upper East			
Northern			
Upper West			
Stunting among children		2020	NDPC, 2022 [1]
under 5 (by sex)			,
Males			
Females			
Stunting among children		2016-2022	NDPC (2020) [8]; NDPC, 2022 [1]
under 5 (by settlement)			
Rural			
Urban			
Stunting among children		2016-2022	NDPC (2020) [8]; NDPC, 2022 [1]
under 5 (by region)			
Greater Accra			
Ashanti			
Brong Ahafo			
Volta			
Eastern			
Western			
Central			
Upper East			
Northern			
Upper West			

4.3 Gender Equality (SDG 5)

Ghana's status in achieving gender equality is summarized in Table 4.3.1. Generally, most gender goals related to discrimination against women and girls, child marriage, economic inequalities, skewed leadership, access and right to reproductive health and policies are progressively improving. For example, female representation in Ghana's parliament stabilized from 14% (2019) to 14% (2020) but increased to 15% in 2021, female ministerial appointments increased from 22% (2019) to 25% (2020) and appointment of female Supreme Court Judges increased from 26% (2019) to 28% (2020) and 31% in 2021 [1]. Also, child marriage among girls before attaining the age of 18 years declined from 23.2% in 2015 to 19% in 2017 [8]. Various stakeholders play vital roles in achieving this progress. For example, Ghana Civil Society Organizations (CSOs) have facilitated the release of land to women in the Ellembelle District and its environs in Ghana under the advocacy of equal opportunities for all [26]. Similarly, government interventions and policies support gender equality in Ghana. For example, the Ministry of Gender, Children, and Social Protection was formed to replace the Ministry of Women and Children's Affairs in 2013 and the National Gender Policy was adopted in 2015 [6]. Also, a quota system was adopted to appoint 30% of women for government appointment and all public institutions as well as the passage of the Affirmative Action Bill in parliament to increase women's participation in decision-making at all levels and ranks [22]. In addition, Ghana enacted and amended gender-related laws such as the Children's Amendment Act, 2016 (Act 937), Ghana Aids Commission Act, 2016 (Act 938), Right to Information Act, 2019 (Act989), Land Act, 2020 (Act 1036) and Real Estate Agency Act, 2020 (Act 1047) to protect the rights and interests of women and children [1]. However, acceleration is needed to reach global targets including sustainable financing of SDG 5. For example, out of the GH¢34.3 million budget allocated for the ministry in 2018, only 14% was allocated for gender equality objectives [6]. Ghana is stagnating with efforts to fight violence against women and girls with insufficient data to track target 5b (Technology for women empowerment). For example, defilement cases declined from 1889 in 2018 to 1720 in 2019 but increased to 1750 in 2020. Similarly, rape cases were reduced by only 1 case from 504 in 2019 to 503 in 2020 [1].

Table 4.3.1 A summary of Ghana's HHSDG progress according to gender equality targets

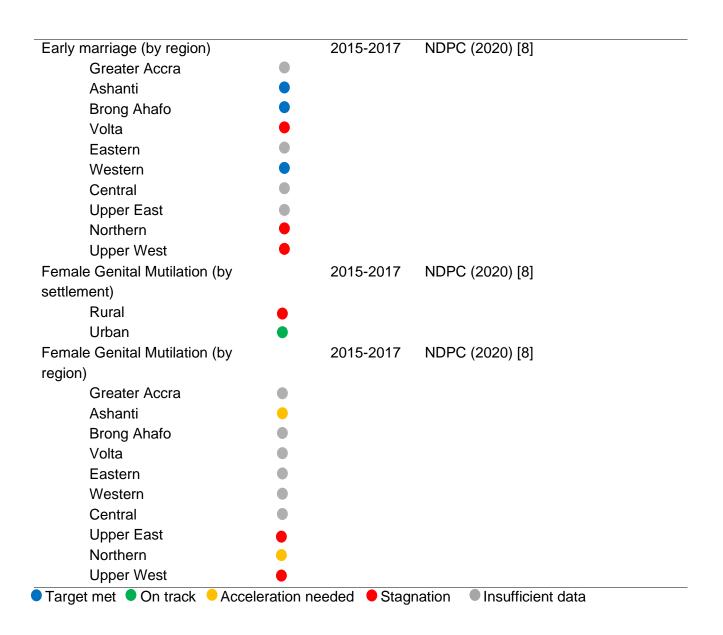
GEHDER EDUALITY	Gender equality goals	Status	Data	Source
₽			coverage	
	5.1 Discrimination against		2018-2022	Lelea et al (2022) [24]; Yakovleva et
	women & girls			al (2022) [27]; Doherty (2018) [28];
				Gbagbo and Nkrumah (2022) [29];
				CSPG, 2019 [26]
	5.2 Violence against women		2008-2017	UNICEF, 2023 [5]; NDPC (2020) [8]
	& girls			
	5.3 Early marriage		2017	UNICEF, 2023 [5]; NDPC (2020) [8];
				GoG, 2019 [10]
	5.4 Unpaid care and domestic		2019-2022	Lelea et al (2022) [24]; Friedman et
	work			al, (2019) [30]

5.5 Women in Leadership	•	2017-2022	Yakovleva et al (2022) [27]; Doherty (2018) [28]; Sachs et al, 2022 [2]; NDPC (2020) [8]; GoG, 2019 [10]; NDPC, 2022 [1]
5.6 Reproductive Health Access & rights	•	2020	Akazili et al (2020) [31]
5. a Equal economic rights	•	2019-2022	Lelea et al (2022) [24]; Yakovleva et al (2022) [27]; Friedman et al, (2019) [30]; Sachs et al, 2022 [2]
b Technology for women empowerment			
5. c Gender equality policies	•	2013-2021	Yakovleva et al (2022) [27]; Gbagbo and Nkrumah (2022) [29]; MoF, 2018 [6]; MoF, 2021 [7]; NDPC, 2022 [1]; Anaafo, 2021 [22]
■ Target met ■ On track ■ Acce	eleration	needed •St	agnation Insufficient data

Sub-level evaluation of Ghana's progress in achieving gender equality was performed according to the type of settlement and administrative regions in Ghana (Table 4.3.2). The SDG 5 targets to end child or early marriage are met in the Ashanti, Brong Ahafo and Western regions of Ghana. However, the Volta, Northern and Upper West regions are stagnating. Similarly, the goal to eliminate harmful practices such as female genital mutilation against the girl child is on track in urban settings of Ghana but stagnating in rural communities. Efforts to eliminate female genital mutilation in Ghana are stagnating in the Upper East and Upper West regions. However, the elimination targets require acceleration in the Ashanti and Northern regions of Ghana.

4.3.2 Sub-level HHSDG progress of gender equality goals

5 GENDER EDUALITY	Gender equality goals	Status	Data	Source
₫"			coverage	!



4.4 Clean Water and Sanitation (SDG 6)

Nationally, acceleration is required to meet the water and sanitation SDG goals in 2030, particularly goals 6.1 (Safe drinking water), 6.2 (Access to sanitation and hygiene) and 6.3 (Water quality). For example, access to safe drinking water and safely managed sanitation have been increasing steadily thus from 80% in 2015 to 86% in 2020 and 11% in 2015 to 13% in 2020 respectively [8]. Open defecation continues to impede the progress of sanitation in Ghana among close to 18% of the population commonly in rural settings (32%) [8]. However, there was not enough data to track the progress of the remaining goals including targets 6.4 (Water-use efficiency), 6.5 (Transboundary water cooperation), 6.6 (Water-related ecosystems), 6. a (International cooperation on water and sanitation) and 6. b (Participatory water and sanitation management) as presented in table 4.4.1. Several policies, programs and interventions have been implemented in efforts to meet global targets for clean and sanitation. For example, the Ministry for Water and Sanitation was established in 2017 to spearhead this national agenda with GH¢126.9 million

core expenditure as of 2018 [6]. However, GH¢750.40 million was allocated in the budget for water and sanitation in 2021 [7]. Similarly, the government of Ghana launched the "Water for All" program, the Community-Led Total Sanitation Program, the Toilet for All Agenda project, the Greater Accra Resilient and Integrated Development Project and the construction of a faecal sludge management infrastructure [7].

Table 4.4.1 A summary of Ghana's HHSDG progress according to clean water and sanitation targets

ATER ITATION	Clean water and sanitation targets	Status	Data coverage	Source
	6.1 Safe drinking water	•	2017-2023	Kusi-Mensah et al (2022) [3]; Kumas et al (2022) [32]; UNICEF, 2023 [5]; Sachs et al, 2022 [2]; NDPC (2020)
	6.2 Access to sanitation & hygiene	•	2017-2023	[8]; GoG, 2019 [10]; NDPC, 2022 [1] Kusi-Mensah et al (2022) [3]; Mensa (2021) [33]; Mensah et al (2021) [34] Abubakari et al (2021) [9]; Quarshie et al (2021) [35]; Foggitt et al (2019) [36]; Cobbinah et al (2020) [37]; UNICEF, 2023 [5]; Sachs et al, 2022 [2]; NDPC (2020) [8]; GoG, 2019 [10]
	6.3 Water quality	•	2021-2022	NDPC, 2022 [1] Adomako et al (2021) [38]; Arthur- Holmes et al (2022) [39]
	6.4 Water-use efficiency			, , , , , , , , , , , , , , , , , , , ,
	6.5 Trans-boundary water cooperation	•		
	6.6 Water-related ecosystems			
	6. a International cooperation on water and sanitation			
	6. b Participatory water and sanitation management	•		

In addition, this review tracked Ghana's progress in achieving universal and equitable access to safe and affordable drinking water for all; access to adequate and equitable sanitation and hygiene infrastructure for all and end open defecation. These were evaluated according to the type of settlement and administrative regions in Ghana (Table 4.4.2). Access to safe drinking water is on track and progressing in urban communities. However, rural communities require acceleration to improve access to safe drinking water. The Ashanti, Bono, Central, Greater Accra, Upper East and Upper West administrative regions are on track to meeting access to safe drinking water goals by 2030. However, the Ahafo, Bono East, Eastern, Volta, Western and Western North regions require acceleration to achieve these goals.

On the other hand, four (4) out of the new sixteen (16) administrative regions (North East, Northern, Oti and Savannah) are stagnating to achieve the water goals. Although access to sanitation and hygiene infrastructure in urban settings of Ghana needs acceleration, progress is stagnating in the rural communities.

4.4.2 Sub-level HHSDG progress of water and sanitation goals

6 DLEAN WATER AND SANITATION	Clean water and sanitation	Status	Data coverage	Source
Ŧ	Access to safe drinking water		2020	NDPC, 2022 [1]
	(by settlement)			
	Rural			
	Urban			
	Access to safe drinking water		2020-2021	NDPC, 2022 [1]
	(by region)			
	Ahafo			
	Ashanti			
	Bono			
	Bono East			
	Central			
	Eastern			
	Greater Accra			
	North East			
	Northern			
	Oti			
	Savannah			
	Upper East			
	Upper West			
	Volta			
	Western			
	Western North			
	Access to sanitation and		2016-2020	NDPC (2020) [8]; NDPC, 2022 [1]
	hygiene (by settlement)			
	Rural			
	Urban			
	■ Target met ■ On track ■ Accel	eration ne	eded 🛑 Stagr	nation Insufficient data

4.5 Climate Action (SDG 13)

As indicated in table 4.5.1. Ghana is on track with climate action goals 13.2 (Climate change policies) and 13a (UNFCCC commitments). For example, Ghana has been a member and a signatory to the UN Framework Convention on Climate Change since 2016 and is committed to reducing total greenhouse gas emissions [8]. In addition, Ghana has developed and launched 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 REDD+ Strategy, 2016-2040 National Forestry Plantation Strategy and the 2018-2021 Medium-term Development Policy Framework [10]. In 2010, the Ministry of Finance of Ghana formed the Natural Resources, Environment, and Climate Change (NRECC) unit and developed a set of Climate Change Finance Tracking Tools in 2016 to enhance the coordination and management of funds [6]. According to Ghana's SDG Budget Baseline Report 2018, GHC121.69 million core expenditure was made on climate action initiatives [6]. However, GHC166.20 million in budget was allocated for climate action in 2021 [7]. Other government-led initiatives such as the Drive Electric Initiative and the Artificial Intelligence-powered medical drones were launched in 2019 to promote electric vehicles to reduce carbon emissions [1,13]. On the other hand, acceleration is required to achieve goals 13.1 (Resilience and adaptive capacity), 13.3 (Climate change awareness) and 13b (Climate change planning and management).

Table 4.5.1 A summary of Ghana's HHSDG progress according to climate targets

13 SUMMYE	Climate targets	Status	Data	Source
			coverage	
	13.1 Resilience & adaptive capacity	•	2017-2023	Issahaku et al (2021) [25]
	13.2 Climate change policies	•	2010-2021	GoG, 2019 [10]; MoF, 2018 [6]; MoF, 2021 [7]; NDPC, 2022 [1]; CSPG, 2019 [26]
	13.3 Climate change awareness	•	2019-2020	Odonkor et al (2020) [40]; CSPG, 2019 [26]
	13. a UNFCCC commitments	•	2020-2022	Sachs et al, 2022 [2]; NDPC (2020) [8]
	13. b Climate change planning and management	•	2018-2021	Damoah et al (2021) [13];Issahaku et al (2021) [25]; GoG, 2019 [10]; MoF, 2018 [6]; MoF, 2021 [7]; CSPG, 2019 [26]
	■ Target met ■ On track ■ Acco	eleration r	needed Sta	gnation Insufficient data

Ultimately, the review chronicled major challenges that stall the progress of HHSDGs in Ghana. These ranged from a myriad of challenges towards HHSDG policy or legislative implementation at the level of Governance to behavioural tendencies of the Ghanaian population. However, poor data tracking and HHSDG progress evaluation systems; and poor information management resonated as a key challenge in all individual HHSDG implementations. Notably, the COVID-19 pandemic had a negative toll on almost all the HHSDG goals. Specific challenges are tabled below:

5.1 Good Health and Wellbeing (SDG 3)

Poor health financing emerged as the most severe challenge that impedes the progress of achieving the health SDG by 2030. Other health challenges include the wide health affordability gap between the rich and the poor; geographical difficulties in accessing healthcare, inequitable posting of health staff, poor health policy implementation, poor NHIS coverage and large disbursement gap; the COVID-19 pandemic; and poor information management and data tracking systems. The least severe but highly neglected challenges that impede Ghana's health progress are the failure to fully implement the Persons with Disability Act, 2006 (Act 715) [41] hence inadequate disability-friendly health facilities; inaccessible sexual, reproductive health and rights (SRHR) services; policy discontinuation by previous governments; and poor commitment for mental health issues.

Table 5.1.1 A summary of Ghana's Health challenges

3 GOOG HEALTH AND WELL-BEING	Challenges	Severity	Data	Source
<i>-</i> ₩•			coverage	
	Inadequate disability-friendly health facilities	•	2020	Abrokwah et al (2020) [42]
	Poor healthcare affordability	•	2020-2021	Abrokwah et al (2020) [42]; Ofosu et al (2021) [43]; Umar et al (2020) [44]; NDPC, 2022 [1]
	Poor healthcare accessibility	•	2019-2020	Abrokwah et al (2020) [42]; NDPC (2020) [8]; GoG, 2019 [10]
	Poor health financing	•	2016-2022	Akazili et al (2020) [31]; Ofosu et al (2021) [43]; Gbagbo and Nkrumah (2022) [29]; International Budget Partnership, 2022 [45]; Akologo, 2016 [46]; GoG, 2019 [10]; Forkuo, 2019 [47]; Ankiilu, 2022 [48]; Blaboe, 2019 [17]
	Inaccessible sexual, reproductive health and rights (SRHR) services	•	2020	Akazili et al (2020) [31]

Inadequate health workforce		2019-2022	Akazili et al (2020) [31]; NDPC (2020)
(Unequitable distribution of			[8]; GoG, 2019 [10]; NDPC, 2022 [1]
workforce)			
Policy discontinuation and		2019	Assan et al (2019) [49]
changed leadership priorities			
(changes in the political			
landscape)			
Poor health policy		2021	Ofosu et al (2021) [43]; Gbagbo and
implementation			Nkrumah (2022) [29]
Poor NHIS coverage and large		2019-2021	Ward et al (2021) [50]; Sheff et al (2020)
disbursement gap			[21]; Umar et al (2020) [44]; Blaboe,
			2019 [17]
Mental health issues missing		2020	NDPC (2020) [8]
from reports			
COVID-19		2022	NDPC, 2022 [1]; Ankiilu, 2022 [48]
Poor information management		2019-2022	Ankiilu, 2022 [48]; Blaboe, 2019 [17]
and data tracking			
Severe: ≤ 1 data source	ore severe:	2-4 data sources	Most severe: >4 data sources

5.2 Zero Hunger (SDG 2)

Similarly, poor financing of the agriculture sector is the most severe challenge to achieving zero hunger in Ghana by 2030. This is followed by the common use of non-mechanized systems, high production and food processing costs due to high import duties, high cost of supplies including seeds and fertilizers; poor HHSDG data management and progress tracking systems; climate change, environmental degradation, the COVID-19 pandemic, food hikes and high food inflation. Lastly, high population growth, poor road network, land encroachment and farm destruction by nomadic farmers commonly lead to insufficient food supply to meet market demands, post-harvest losses and farm losses respectively.

Table 5.2.1 A summary of challenges impeding Ghana's nutritional goals

2 ZERO HUNGER	Challenges	Severity	Data coverage	Source
	Poor mechanized systems and improved agricultural practices (hybrid seeds, and technology)	•	2018-2022	Quarshie et al (2022) [51]; NDPC (2020) [8]; MoF, 2018 [6]
	Poor agriculture financing and investments	•	2016-2022	Quarshie et al (2022) [51]; International Budget Partnership, 2022 [45]; Akologo, 2016 [46]; NDPC (2020) [8]; GoG, 2019 [10]; Anaafo, 2021 [22]; Forkuo, 2019 [47]
	High production and processing costs (high import duties, high	•	2018-2022	Quarshie et al (2022) [51]; NDPC (2020) [8]; GoG, 2019 [10]; MoF, 2018 [6]

cost of supplies: seeds, fertilizers		
etc.)		
Poor data management and	0 2016-2022	Akologo, 2016 [46]; Ankiilu, 2022 [48]
tracking		
Population growth	2020	NDPC (2020) [8]
Climate change	0 2018-2022	NDPC (2020) [8]; MoF, 2018 [6]; MoF,
		2021 [7]; NDPC, 2022 [1]
Environmental/Land degradation	0 2018-2022	NDPC (2020) [8]; MoF, 2018 [6]; MoF,
		2021 [7]; NDPC, 2022 [1]
COVID-19	<u> </u>	NDPC, 2022 [1]; Ankiilu, 2022 [48]
Poor road network	2022	NDPC, 2022 [1]
Food hikes/high food inflation	0 2018-2022	MoF, 2018 [6]; NDPC, 2022 [1]
(unstable food pricing)		
Illegal mining/Galamsey	2022	NDPC, 2022 [1]
Land encroachment and	2022	NDPC, 2022 [1]
destruction by nomadic farmers		
Severe: ≤ 1 data source Mo	ore severe: 2-4 data sources	Most severe: >4 data sources

5.3 Gender Equality (SDG 5)

Poor information management systems and data tracking tools to evaluate SDG 5 progress; poor program financing; poor coordination and lack of decentralization of gender programs to local assemblies pose a more severe challenge to achieving gender equality by 2030. In addition, the fragmentation of support services for gender-based violence victims, the patriarchal society in some Ghanaian communities, inadequate lactating-mother-friendly infrastructures to support corporate lactating mothers to effectively practise exclusive breastfeeding; delay in passage and poor implementation of gender laws and policies; and some cultural practices continue to stall the progress of the gender equality goals.

Table 5.3.1 A summary of challenges impeding Ghana's gender equality goals

HOER UJALITY	Challenges	Severity	Data coverage	Source
	Fragmentation of support services for gender-based violence victims	•	2020	Akazili et al (2020) [31]
	Patriarchal society		2019	Friedman et al, (2019) [30]
	Inadequate lactating mother- friendly infrastructure/ institutions	•	2022	Gbagbo and Nkrumah (2022) [29]
	Poor data and information management systems (eg. Lack of data tracking tools,	•	2016-2022	Akologo, 2016 [46]; International Budget Partnership, 2022 [45]; Anaafo, 2021 [22]; CSPG, 2019 [26]

lack of access to expenditure records)			
Poor program financing/ Poor		2016-2022	Akologo, 2016 [46]; International Budget
budget allocation			Partnership, 2022 [45]; Forkuo, 2019
.			[47]; CSPG, 2019 [26]
Poor coordination and		2016-2022	Akologo, 2016 [46]; International Budget
decentralization			Partnership, 2022 [45]; Forkuo, 2019
			[47]
Delays in the passage of laws		2020	NDPC (2020) [8]
and poor policy			, , , , ,
implementation			
Cultural practices		2020	NDPC (2020) [8]
Severe: ≤ 1 data source	e severe: 2	-4 data sources	Most severe: >4 data sources

5.4 Clean Water and Sanitation (SDG 6)

Poor financing for the production of clean water and implementation of sanitation programs; and poor budget credibility emerged as the most common and severe challenges to achieving SDG 6 by 2030 in Ghana. In between, unsanitary behavioural practices and superstitious perceptions by the Ghanaian population, the high cost of installing and maintaining toilet facilities by the Government and landlords; and unequal distribution of social amenities such as toilet facilities and waste management bins pose a challenge to the SDG 6. Though not the most severe, poor law enforcement on sanitation, limited town planning monitoring systems, poor coordination and decentralization of water and sanitation programs, poor data tracking and management systems and poor project management and monitoring systems form the basis for poor progress performance in the implementation of SDG 6 goals.

Table 5.4.1 A summary of challenges impeding Ghana's water and sanitation goals

IN WATER SANITATION	Challenges	Severity	Data	Source
Å			coverage	
	Poor behavioural practices and superstitious perceptions	•	2020-2021	Quarshie et al (2021) [35]; Cobbinah et al (2020) [37]; NDPC (2020) [8]
	High cost of installing and maintaining toilet facilities		2019-2020	Foggitt et al (2019) [36]; Cobbinah et al (2020) [37]
	Poor law enforcement on sanitation	•	2019	Foggitt et al (2019) [36]
	Limited town planning monitoring systems	•	2020	Cobbinah et al (2020) [37]
	Poor budget credibility/ poor financing	•	2016-2022	International Budget Partnership, 2022 [45]; Akologo, 2016 [46]; GoG, 2019 [10]; MoF, 2018 [6]; Forkuo, 2019 [47]
	Poor coordination and decentralization	•	2016	Akologo, 2016 [46]

Poor data tracking and	•	2016	Akologo, 2016 [46]
management systems			
Unequal distribution of social		2018-2019	GoG, 2019 [10]; MoF, 2018 [6]
amenities/limited resources			
Poor project		2018	MoF, 2018 [6]
management/monitoring			
systems			
Severe: ≤ 1 data source	More severe: 2	2-4 data sources	Most severe: >4 data sources

5.5 Climate Action (SDG 13)

Poor financing for climate action programs and poor budget credibility among key stakeholders are the most severe challenges to attaining SDG 13 climate goals. This is followed by low awareness of climate change among the Ghanaian population hence there is low prioritization of information services on climate action; and poor data tracking and information management systems. Finally, most human institutions in Ghana may not have the required capacity to appreciate and effectively manage climate change hence poorly coordinated and centralized climate programs.

Table 5.5.1 A summary of challenges impeding Ghana's climate action goals

13 SLIMATE ACTION	Challenges	Severity	Data	Source
	-		coverage	
	Low awareness	•	2020-2021	Antwi-Agyei et al (2021) [52]; NDPC (2020) [8]
	Low prioritization/ appreciation of information services on climate action	•	2020-2021	Antwi-Agyei et al (2021) [52]; NDPC (2020) [8]
	Poor human institutional capacity	•	2021	Antwi-Agyei et al (2021) [52]
	Poor coordination and decentralization	•	2021	Antwi-Agyei et al (2021) [52]
	Poor budget credibility/ poor financing	•	2016-2022	International Budget Partnership, 2022 [45]; Akologo, 2016 [46]; NDPC (2020) [8]; GoG, 2019 [10]; MoF, 2021 [7]; Forkuo, 2019 [47]; CSPG, 2019 [26]
	Poor data tracking and information management systems	•	2016-2022	International Budget Partnership, 2022 [45]; Akologo, 2016 [46]; NDPC (2020) [8]
	Severe: ≤ 1 data source	More severe: 2	2-4 data sources	Most severe: >4 data sources

6.0 Conclusion and recommendations for achieving HHSDG global goals 2030 in Ghana

Ghana has made significant progress in implementing some HHSDG goals. This is evident in the commitments demonstrated by various Governments and stakeholders from September 2015 to October 2022. However, Ghana needs to develop a more cost-effective, integrated, coordinated and evaluated strategy in real time to accelerate progress toward meeting the HHSDG targets in Ghana by 2030. Valuable data were missing for Mental Health whereas there was insufficient data to reliably evaluate Ghana's HHSDG progress on child labour, intimate-partner violence, non-intimate-partner violence, caregiver violence among children 1-14 years; air quality; Water, Sanitation and Hygiene (WASH) infrastructure in schools. This report recommends the use of real-time data monitoring tools and offline data collection and management algorithms and dashboards to facilitate continuous and effective data entry and data access irrespective of geographical location and internet connectivity. In addition, the government needs to integrate stakeholders such as Corporate Society Organisations (CSOs), Non-Governmental Organisations (NGOs), academia, Think Tanks and various partners in private practice in its SDG implementation strategies for a synergistic output with additional priority given to vulnerable groups. A decentralized and coordinated approach to promote regional integration, collaborations and knowledge exchange including cross-national collaborations should be prioritized to accelerate the implementation of the 2030 SDG agenda. Similarly, as much as a more stable funding mechanism is needed, there should be efforts to ensure budget credibility to abate the usual chorus of insufficient funding. Also, studies should be conducted to evaluate HHSDG interventions and programs and to assess the intersection of HHSDGs, particularly on how one or more HHSDGs impart or influence others. Finally, to achieve HHSDGs by 2030, the Ghanaian population must be sensitized enough through community involvement and engagement to buy into the implementation strategies, policies and interventions deployed.

To address some of the challenges identified, Ghana's team aimed to have a national-level multidisciplinary, autonomous, independent and inclusive Think Tank to facilitate, promote and create the momentum needed to build effective multi-sectoral strategies to address the challenges hindering progress to achieving the HHSDGs. The Ghana Think Tank was established in August 2023 with membership comprising government officials, academics, and members of the civil society. See Table 6.1.

The Think Tank constitute of experts in the area of climate change (ie. Green Africa Youth), health (including mental health) and gender inequalities (i.e., Basic Needs Ghana Ghana National Association of Persons with Disability), relevant government institutions (i.e., United Nation Population Fund (UNFPA), civil society and advocacy groups (i.e., Ghana Monitoring and Evaluation Forum, National Development Planning Commission) with focus on the HHSDGs. Representatives were appointed ensuring broad geographical and gender representation. Two "general" Think Tank meetings were held in August and November 2023. In addition, several "caucus" Think Tank meeting were held to tap the expertise of members on specific issues during the synthesis of the evidence on Ghana's progress toward the attainment of the HHSDGs.

Table 6.1. Ghana Think Tank members

S/N	Name	Name of Institution		
1.	Dr. Opare Djan	National Development Planning Commission, NDPC nana.oparedjan@ndpc.gov.gh 0244149954		
2.	Mrs. Vera Karikari Bediako	Gender Department, Ministry of Gender, Children and Social Protection		
3.	Mr. Labram Musah	Vision for Alternative Development, VALD labrammusah@valdgh.com 0243211852		
4.	Mrs. Dede Abena Bedu Addo	Ghana Monitoring and Evaluation Forum abbedums@gmail.com 0277534204		
5.	Ms. Margaret Impraim (representative)	Green Africa Youth Organization support@youthclimatecouncil.com		
6.	Mr. Peter Badimak Yaro	Basic Needs Ghana peter.yaro@basicneedsghana.org 0244572733		
7.	Lawyer Esther Akua Gyamfi	Ghana National Council on Persons with Disability esther.akua.gyamfi.gmail.com 0244237377/0264237367		
8.	Prof. Frederick Ato Armah	University of Cape Coast farmah@ucc.edu.gh 0249483014		
9.	Dr. Emmanuel Nii-Boye Quarshie	University of Ghana enquarshie@ug.edu.gh 0240446684		
10.	Dr. Arti Singh	Kwame Nkrumah University of Science and Technology artisingh_uk@yahoo.com 0244464576		
11.	Dr. Vida Yakong	University for Development Studies kawongugre@gmail.com 050670315		
12.	Mr. Eric Okrah	United Nations Population Fund, UNFPA okrah@unfpa.org		
13.	Mrs. Levlyn K. Asiedu	Ghana CSOs Platform on SDGs 0201617590		
14.	Ms. Irene Asamoah	Ghana National Council on Persons with Disability 0244237377/0264237367		

References

- NDPC. Ghana's 2022 Voluntary National Review Report on the Implementation of the 2030 Agenda for Sustainable Development [Internet]. Ghana: National Development Planning Commission; 2022 Jun [cited 2023 Jan 28] p. 168. Available from: https://ghana.un.org/en/195640-ghana-2022-voluntary-national-review-report-implementation-2030-agenda-sustainable
- 2. Sachs J, Kroll C, Lafortune G, Fuller G, Woelm F. Sustainable Development Report 2022 [Internet]. 1st ed. University Printing House, Cambridge CB2 8BS, United Kingdom: Cambridge University Press; 2022 [cited 2023 Jan 28]. Available from: https://www.cambridge.org/core/product/identifier/9781009210058/type/book
- Kusi-Mensah K, Tamambang R, Bella-Awusah T, Ogunmola S, Afolayan A, Toska E, Hertzog L, Rudgard W, Evans R, Omigbodun O. Accelerating progress towards the sustainable development goals for adolescents in Ghana: a cross-sectional study. Psychol Health Med [Internet]. 2022; Available from: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85135994102&doi=10.1080%2f13548506.2022.2108086&partnerID=40&md5=64eb42f11274770b1 cd59488e980dd11
- 4. Amu H, Osei E, Kofie P, Owusu R, Bosoka SA, Konlan KD, Kim E, Orish VN, Maalman RSE, Manu E, Parbey PA, Saah FI, Mumuni H, Appiah PK, Komesuor J, Ayanore MA, Amenuvegbe GK, Kim S, Jung H, Adjuik M, Tarkang EE, Alhassan RK, Donkor ES, Zottor FB, Kweku M, Amuna P, Kim SY, Gyapong JO. Prevalence and predictors of depression, anxiety, and stress among adults in Ghana: A community-based cross-sectional study. PLoS ONE [Internet]. 2021;16(10 October). Available from: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85116879667&doi=10.1371%2fjournal.pone.0258105&partnerID=40&md5=b5ff6e5b1ba432df4388 8f837b413550
- 5. UNICEF. Child-Related SDG Progress Assessment for Ghana [Internet]. UNICEF DATA. 2023 [cited 2023 Jan 22]. Available from: https://data.unicef.org/sdgs/country/gha/
- 6. MoF. Ghana's SDG Budget Baseline Report 2018 [Internet]. Ghana: Ministry of Finance; 2018 [cited 2023 Jan 28] p. 27. Available from: https://mofep.gov.gh/sites/default/files/news/Ghana's-SDG-Budget-Baseline-Report-Aug-09-18.pdf
- 7. MoF. Ghana's 2021 SDGs Budget Report [Internet]. Ghana: Ministry of Finance; 2021 [cited 2023 Jan 28] p. 75. Available from: https://mofep.gov.gh/sites/default/files/reports/economic/2021-Ghana-SDG-Report.pdf
- 8. NDPC. 2020 SDGs Report: Ghana [Internet]. Ghana: National Development Planning Commission; 2020 [cited 2023 Jan 28] p. 98. Available from: https://ndpc.gov.gh/media/2020_SDGs_Report-Final.pdf
- 9. Abubakari SW, Oppong FB, Wiru K, Manu G, Apraku EA, Abukari M, Zandoh C, Asante KP. Open defecation and attainment of Sustainable Development Goal Six: evidence from Kintampo Surveillance System, Ghana. Ghana Med J. 2021 Dec;55(4):273–7.
- 10. GoG. Ghana: Voluntary National Review on the Implementation of the 2030 Agenda for Sustainable Development [Internet]. Ghana: Government of Ghana; 2019 Jun [cited 2023 Jan 28] p. 127. Available from: https://ghana.un.org/en/19155-ghana-voluntary-national-review-reportimplementation-2030-agenda-sustainabledevelopment#:~:text=The%20Ghana%20Voluntary%20National%20Review,as%20opportunities%2 0to%20be%20explored.

- 11. UN. The race to zero emissions, and why the world depends on it | UN News [Internet]. UN News. 2020 [cited 2023 May 2]. Available from: https://news.un.org/en/story/2020/12/1078612
- 12. SDR. Sustainable Development Report 2023 [Internet]. The Sustainable Development Report. 2023 [cited 2023 Nov 25]. Available from: https://dashboards.sdgindex.org/
- 13. Damoah IS, Ayakwah A, Tingbani I. Artificial intelligence (AI)-enhanced medical drones in the healthcare supply chain (HSC) for sustainability development: A case study. J Clean Prod [Internet]. 2021;328. Available from: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85119596994&doi=10.1016%2fj.jclepro.2021.129598&partnerID=40&md5=7d66c20111631b4a47d 46fb0f61d8ab5
- 14. Kremer P, Haruna F, Tuffour Sarpong R, Agamah D, Billy J, Osei-Kwakye K, Aidoo P, Dodoo D, Okoh-Owusu M. An impact assessment of the use of aerial logistics to improve access to vaccines in the Western-North Region of Ghana. Vaccine. 2023 Aug 14;41(36):5245–52.
- 15. UN. Progress Chart SDG Indicators [Internet]. UN Sustainable Development Goals. 2023 [cited 2023 Nov 25]. Available from: https://unstats.un.org/sdgs/report/2023/progress-chart/
- 16. Khalil A, Samara A, O'Brien P, Coutinho CM, Quintana SM, Ladhani SN. A call to action: the global failure to effectively tackle maternal mortality rates. The Lancet Global Health. 2023 Aug 1;11(8):e1165–7.
- 17. Blaboe NA. ASSESSING SDG 3: ACHIEVING UNIVERSAL HEALTH COVERAGE IN GHANA [Internet] [Masters thesis]. [Ghana]: University of Ghana; 2019 [cited 2023 Jan 28]. Available from: https://ugspace.ug.edu.gh/handle/123456789/33671
- 18. Akweongo P, Aikins M, Wyss K, Salari P, Tediosi F. Insured clients out-of-pocket payments for health care under the national health insurance scheme in Ghana. BMC Health Serv Res. 2021 Dec;21(1):440.
- 19. Yambah JK, Mensah KA, Kuunibe N, Laar K, Atinga RA, Ofori Boateng M, Opoku D, Quentin W. The effect of the capitation policy withdrawal on maternal health service provision in Ashanti Region, Ghana: an interrupted time series analysis. Glob Health Res Policy [Internet]. 2022;7(1). Available from: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85140231276&doi=10.1186%2fs41256-022-00271-1&partnerID=40&md5=462078785b6f90d457af45f7d8a1b55c
- 20. Agyemang-Duah W, Peprah C, Arthur-Holmes F. Prevalence and Patterns of Health Care Use Among Poor Older People Under the Livelihood Empowerment Against Poverty Program in the Atwima Nwabiagya District of Ghana. Gerontol Geriatr Med. 2019 Dec;5:2333721419855455.
- 21. Sheff MC, Bawah AA, Asuming PO, Kyei P, Kushitor M, Phillips JF, Kachur SP. Evaluating health service coverage in Ghana's Volta Region using a modified Tanahashi model. Global Health Action [Internet]. 2020;13(1). Available from: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85081736298&doi=10.1080%2f16549716.2020.1732664&partnerID=40&md5=72140136abe2140c 64b2cf8f23e08ede
- 22. Anaafo D. Tracking the Progress on the Localization of the SDGs: Lessons for the West African Sub-region from Ghanaian Local Governments [Internet]. Accra, Ghana: Good Governance Africa West African Regional Office (GGA WARO) The Paragon, 3rd Floor Master Bannor Street / 9th Lane, Osu Behind the Trust Hospital, Osu-Accra; 2021 Jul [cited 2023 Jan 28] p. 91. Available from: https://www.africaportal.org/documents/21672/Localization-of-the-SDGs-in-Ghana.pdf

- 23. Nanewortor BM, Saah FI, Appiah PK, Amu H, Kissah-Korsah K. Nutritional status and associated factors among people living with HIV/AIDS in Ghana: cross-sectional study of highly active antiretroviral therapy clients. BMC nutrition. 2021 May 27;7(1):14.
- 24. Lelea MA, Konlan LM, Ziblila RC, Thiele LE, Amo-Aidoo A, Kaufmann B. Strategies to Promote Sustainable Development: The Gendered Importance of Addressing Diminishing African Locust Bean (Parkia biglobosa) Resources in Northern Ghana's Agro-Ecological Landscape. Sustainability [Internet]. 2022;14(18). Available from: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85138746731&doi=10.3390%2fsu141811302&partnerID=40&md5=d51badd98c2096f7302f5350efe 4ab4f
- 25. Issahaku G, Abdul-Rahaman A, Amikuzuno J. Climate change adaptation strategies, farm performance and poverty reduction among smallholder farming households in Ghana. Clim Dev. 2021;13(8):736–47.
- 26. CSPG. Progress on the SDGS: Telling the Ghanaian story through the lens of citizens [Internet]. Ghana: Civil Society Platform Ghana; 2019 Jun [cited 2023 Jan 28] p. 91. Available from: https://action4sd.org/wp-content/uploads/2019/10/VNR-Shadow-Report-from-the-Ghana-CSOs-Platform-on-SDGs-June-2019.pdf
- 27. Yakovleva N, Vazquez-Brust DA, Arthur-Holmes F, Abrefa Busia K. Gender equality in artisanal and small-scale mining in Ghana: Assessing progress towards SDG 5 using salience and institutional analysis and design. Environ Sci Policy. 2022;136:92–102.
- 28. Doherty B. Gender equality and women's empowerment through fair trade social enterprise: Case of divine chocolate and Kuapa Kokoo [Internet]. Contemp. Issues. Entrep. Res. Emerald Group Publishing Ltd.; 2018. 151 p. (Contemporary Issues in Entrepreneurship Research; vol. 8). Available from: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85065486318&doi=10.1108%2fS2040-724620180000008014&partnerID=40&md5=4abb6c5809120dc40ac372820549f72f
- 29. Gbagbo FY, Nkrumah J. Breastfeeding-friendly policies and programs in three public Universities in Ghana. Int Breastfeeding J [Internet]. 2022;17(1). Available from: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85128073087&doi=10.1186%2fs13006-022-00468-7&partnerID=40&md5=44994cb55118e6210823a075dd06809f
- 30. Friedman R, Hirons MA, Boyd E. Vulnerability of Ghanaian women cocoa farmers to climate change: a typology. Clim Dev. 2019;11(5):446–58.
- 31. Akazili J, Kanmiki EW, Anaseba D, Govender V, Danhoundo G, Koduah A. Challenges and facilitators to the provision of sexual, reproductive health and rights services in Ghana. Sex Reprod Health Matters [Internet]. 2020;28(2). Available from: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85096368313&doi=10.1080%2f26410397.2020.1846247&partnerID=40&md5=75d2ed9202c5d8c593030596efbf7345
- 32. Kumasi TC, Nyarko KB, Antwi-Agyei P. Universal water service delivery: Insights on what it takes from Ghana. World Water Policy. 2022;8(1):9–30.
- 33. Mensah J. Fisherfolk's Perception of and Attitude to Solid Waste Disposal: Implications for Health, Aquatic Resources, and Sustainable Development. J Environ Public Health [Internet]. 2021;2021. Available from: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85104923711&doi=10.1155%2f2021%2f8853669&partnerID=40&md5=9f1968aebf686f53b53895b 868a5234f

- 34. Mensah J, Tachie BY, Potakey HMD. Open defecation near a world heritage site: causes and implication for sustainable tourism and heritage management. J Cult Herit Manage Sustainable Dev [Internet]. 2021; Available from: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85113790932&doi=10.1108%2fJCHMSD-11-2020-0164&partnerID=40&md5=d64d737e7c039bd0ff2a8cc37f5f2736
- 35. Quarshie AM, Gyasi SF, Kuranchie FA, Awuah E, Darteh E. Conceptual Behaviour Underpinning the Occurrence of Nonfaecal Matter in Faecal Sludge in Some Urban Communities, Ghana. Okosun IS, editor. Journal of Environmental and Public Health. 2021 May 10;2021:1–10.
- 36. Foggitt E, Cawood S, Evans B, Acheampong P. Experiences of shared sanitation towards a better understanding of access, exclusion and 'toilet mobility' in low-income urban areas. J Water Sanit Hyg Develop. 2019;9(3):581–90.
- 37. Cobbinah PB, Kosoe EA, Diawuo F. Environmental planning crisis in urban Ghana: Local responses to nature's call. Sci Total Environ. 2020 Jan 20;701:134898.
- 38. Adomako LAB, Yirenya-Tawiah D, Nukpezah D, Abrahamya A, Labi AK, Grigoryan R, Ahmed H, Owusu-Danquah J, Annang TY, Banu RA, Osei-Atweneboana MY, Timire C, Tweya H, Ackon SED, Nartey E, Zachariah R. Reduced bacterial counts from a sewage treatment plant but increased counts and antibiotic resistance in the recipient stream in accra, ghana—a cross-sectional study. Trop Med Infect Dis [Internet]. 2021;6(2). Available from: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85106938318&doi=10.3390%2ftropicalmed6020079&partnerID=40&md5=12c97ca8eb2fbde10ecf8 df3fff6a801
- 39. Arthur-Holmes F, Abrefa Busia K, Yakovleva N, Vazquez-Brust DA. Artisanal and small-scale mining methods and the Sustainable Development Goal 6: Perceived implications for clean water supply. Environ Sci Policy. 2022;137:205–15.
- 40. Odonkor ST, Dei EN, Sallar AM. Knowledge, attitude, and adaptation to climate change in Ghana. Sci World J [Internet]. 2020;2020. Available from: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85097676046&doi=10.1155%2f2020%2f3167317&partnerID=40&md5=c58b8f56b35e8ff2ba62f358 a57d7796
- 41. Asante LA, Sasu A. The Persons with Disability Act, 2006 (Act 715) of the Republic of Ghana: The Law, Omissions and Recommendations. Journal of Law, Policy and Globalization. 2015;36.
- 42. Abrokwah R, Aggire-Tettey EM, Naami A. Accessing healthcare in Ghana: Challenges encountered and strategies adopted by persons with disabilities in accra. Disabil CBR and Incl Dev. 2020;31(1):120–41.
- 43. Ofosu B, Ofori D, Ntumy M, Asah-Opoku K, Boafor T. Assessing the functionality of an emergency obstetric referral system and continuum of care among public healthcare facilities in a low resource setting: an application of process mapping approach. BMC Health Serv Res. 2021 Dec;21(1):402.
- 44. Umar S, Fusheini A, Ayanore MA. The shared experiences of insured members and the uninsured in health care access and utilization under Ghana's national health insurance scheme: Evidence from the Hohoe Municipality. PLoS ONE. 2020 Dec 23;15(12):1–21.
- 45. International Budget Partnership. Ghana: Budget Credibility and the Sustainable Development Goals Publications [Internet]. International Budget Partnership. 2022 [cited 2023 Jan 23].

- Available from: https://internationalbudget.org/publications/ghana-budget-credibility-and-the-sustainable-development-goals/
- 46. Akologo SZ. Bringing the Sustainable Development Goals (SDGs) to Life in Ghana: An assessment report on Implementation status [Internet]. Ghana: Caritas Ghana; 2016 Oct [cited 2023 Jan 28] p. 54. Available from: https://www.caritas-ghana.org/wp-content/uploads/2018/06/Bringing-SDGs-to-life-in-Ghana-A-Caritas-Ghana-Assessment-Report.pdf
- 47. Forkuo DE. Mainstreaming Sustainable Development Goals (SDGs) into Local Development Planning: A Comparative Study of Adentan and Lankwantanang- Madina Municipal Assemblies. [Internet] [Master's thesis]. [Ghana]: University of Ghana; 2019 [cited 2023 Jan 23]. Available from: https://ugspace.ug.edu.gh/bitstream/handle/123456789/35824/Mainstreaming%20Sustainable%20 Development%20Goals%20(SDGS)%20into%20Local%20Development%20Planning%20A%20Comparative%20Study%20of%20Adentan%20and%20Lankwantanang-%20Madina%20Municipal%20Assemblies.pdf?sequence=1&isAllowed=y
- 48. Ankiilu M. Is Ghana on Track to Meet the Sustainable Development Goals? [Internet]. African Eye Report. 2022 [cited 2023 Jan 23]. Available from: https://africaneyereport.com/is-ghana-on-track-to-meet-the-sustainable-development-goals/
- 49. Assan A, Takian A, Aikins M, Akbarisari A. Challenges to achieving universal health coverage through community-based health planning and services delivery approach: A qualitative study in Ghana. BMJ Open [Internet]. 2019;9(2). Available from: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85062083388&doi=10.1136%2fbmjopen-2018-024845&partnerID=40&md5=449385872247671ac3b399b9f7898e5d
- 50. Ward CL, Guo MZ, Amukele TK, Abdul-Karim A, Schroeder LF. Availability and Prices of WHO Essential Diagnostics in Laboratories in West Africa: A Landscape Survey of Diagnostic Testing in Northern Ghana. J Appl Lab Med. 2021;6(1):51–62.
- 51. Quarshie PT, Antwi-Agyei P, Suh NN, Fraser EDG. Tackling post-COVID-19 pandemic food crises through the adoption of improved maize seeds and technologies by smallholder farmers: The case of Ejura Sekyeredumase in Ghana. Front Sustain food Syst [Internet]. 2022;6. Available from: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85140074748&doi=10.3389%2ffsufs.2022.804984&partnerID=40&md5=5b36a422e6ed54e7d0f29a db55322095
- 52. Antwi-Agyei P, Dougill AJ, Doku-Marfo J, Abaidoo RC. Understanding climate services for enhancing resilient agricultural systems in Anglophone West Africa: The case of Ghana. Clim Serv [Internet]. 2021;22. Available from: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85103130570&doi=10.1016%2fj.cliser.2021.100218&partnerID=40&md5=cea63d9ef93d0fe7f08a6e 4d9de80106