


REVIEW

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# Promoting equity and justice: harnessing the right to food for Africa's food security

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## Abstract

This paper examines the state of food security in African nations within the context of promoting equity and justice through the right to food. It discusses the various challenges faced by the African nations, including poverty, climate change, and urbanization, which impact the availability, accessibility, and utilization of food resources. It further emphasises the importance of secure land tenure rights, gender equality and women empowerment, good nutrition and safe food, sustainable agricultural practices as well as sustainable food system transformation to ensure food and nutrition security, environmental quality and human well-being. This paper further advocates for stringent efforts involving governance, accountability, and international cooperation to achieve sustainable development goals and ensure food security for all in Africa, thereby fostering equity and justice in the food system.

**Keywords** Food security, Africa, Right to food, Climate change, Equity, Justice, Nutrition

## Introduction

Food insecurity remains a pressing issue in Africa, where over 800 million people go to bed hungry, while over 135 million face severe food insecurity [148]. While the

availability and access to food remain the main impediments to the right to food in Africa, the adequacy of the available food compounds these challenges, with 78% of Africa's population unable to afford healthy meals leading to a high prevalence of diseases associated with nutritional deficiencies [61, 68]. The Africa Center for Strategic Studies [3] identifies ongoing and unresolved conflicts as one of the primary challenges preventing the achievement of food security in Africa, citing conflict-affected countries such as the Democratic Republic of Congo (DRC), Ethiopia, Sudan, Nigeria, and South Sudan as the most food insecure countries in the region. Other challenges in achieving food security in Africa include climate change, which affects food production, limited core economic strength, which limits African countries' investment in agriculture and food production, and rapid population growth, straining the continent's already limited ability to feed its burgeoning population [213]. These challenges are hastening Africa's descent into a food crisis amidst calls for prompt action.

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The significance of addressing this crisis is further underscored by the fact that food insecurity violates the fundamental human right to food. To tackle this issue, the International Covenant on Economic, Social, and Cultural Rights (ICESCR), adopted by the United Nations in 1966, establishes the right to food under international law [172, 173]. Article 11 of the International Covenant on Economic, Social, and Cultural Rights (ICESCR), a multilateral treaty that was adopted by the United Nations in 1966, establishes the right to food under international law [172, 173]. Consequently, all members of the United Nations are required to enforce this right by ensuring that everyone has access to food, is free from hunger, and is not deprived of access to sufficient safe and nutritious food. Furthermore, member states of the United Nations are obliged to provide food to vulnerable individuals who cannot realize their right to food through aid while establishing long-term measures to promote self-reliance and guarantee food security in the future [172, 173]. The United Nations Human Rights Office of the High Commissioner [195] breaks down the meaning and importance of the right to food into four components. These are food availability, accessibility, adequacy, and sustainability. For the right to be realized, food should be easy to obtain from natural resources, affordable to allow for universal adequate consumption without compromising the ability to afford other basic needs, and accommodate safety of food. Above all, the planet’s ability to produce food should not be compromised to secure current and future access to food. Today, these elements of the right to food are protected and upheld by various countries across the world, which recognize the right to food as a basic and inalienable human right. However, some countries do not recognize this basic human right (with Australia and the United States of America as notable exceptions) [109].

Despite the near-universal recognition of the right to food across the world, billions of people from all over the world are food insecure, with an estimated 900 million

people facing acute hunger, while 2.4 billion people experience moderate-to-severe food insecurity [194]. The purpose of this article is to critically examine the current state of food security in Africa within the context of the right to food as established by Article 11 of the International Covenant on Economic, Social, and Cultural Rights (ICESCR). It aims to highlight the gap between the recognition of the right to food under international law and the reality of food insecurity affecting billions worldwide, particularly in Africa. The article seeks to explore the underlying causes of food insecurity in the continent and intends to scrutinize the efforts made by African nations and the international community to uphold the right to food and address the challenges hindering its realization. It discusses the importance of food availability, accessibility, adequacy, and sustainability as critical components of the right to food and evaluates how these are being compromised in the African context. By doing so, the article would advocate for urgent and concerted actions to ensure that the right to food is not just a legal entitlement but a lived reality for all Africans, thereby promoting equity and justice in the region’s food security landscape.

**Legal frameworks and policy implementation**

The fight for food security in Africa is supported by several legal frameworks and policy measures at international, regional, and national levels, as shown in Table 1. African parties to the International Covenant on Economic, Social, and Cultural Rights (ICESCR) recognize the universal right to food as held by Article 11 and uphold its provisions as outlined in Article 2. These provisions include individual, regional, or international cooperation and assistance to ensure universal access to adequate, nutritional, and sustainable sources of food and the adoption of all appropriate means, including legislation, to secure their citizens and residents’ right to food [68]. However, the ICESCR has no compulsory reporting and enforcement procedures where states must be

**Table 1** Legal frameworks involved in food security in Africa

Legal framework	Key aspects
International Covenant on Economic, Social, and Cultural Rights (ICESCR)	Recognizes the universal right to food (Article 11). Upholds provisions outlined in Article 2, including cooperation to ensure access to food
Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW)	Protects women’s rights, including the right to food
African Charter on Human and People’s Rights (Banjul Charter)	Calls on African Union members to establish measures to guarantee the right to food (ACHPR)
Malabo Declaration	Addresses food security agenda and measures to improve agriculture between 2015 and 2025
Africa Regional Nutritional Strategy	Reiterates the right to adequate food for the period between 2015 and 2025

compelled to adhere to their obligations and in the areas of obligations, the requirement for states to take steps to the maximum of available resources probably results to the postponement of formulation and implementation of food security measures due to political reasons or lack of funds. The enhancement of monitoring and accountability within the ICESCR together with clearer and effective resource allocation guidelines could trigger more forthright action [68]. In addition to the ICESCR, the right to food is mandated by other international legal instruments that focus on the needs and rights of special groups of the population. Notably, the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) binds members to facilitate the protection of women's rights, including the right to food, with Article 12 establishing special protections for pregnant and lactating women [68]. Its enforcement, however, remains poor in many African countries where women are limited by cultural and legal means in accessing food. Extending the CEDAW's applicability to other categories of marginalized people and assimilating its tenets into the country's food security frameworks may help form a broader international framework [68]. Africa has established some regional legal frameworks in addition to these international laws. Notably, the African Charter on Human and People's Rights, also known as the Banjul Charter, passed a resolution calling on all members of the African Union to establish relevant measures to guarantee the right to food, including policy, legislative, and institutional measures [1]. The union recognizes the cultural acceptability of food as one of the key elements of the right. However, it fails to have specific action plans and time frame within which they are to be achieved or for effecting change, therefore, the progress achieved across the African continent varies. A stricter regime under the AU and a regional watchdog organization would possibly guarantee a more consistent approach towards the protection of food rights throughout Africa [1]. Other regional instruments addressing the right to food in Africa include the Malabo Declaration of 2014, which addressed the food security agenda and established measures to improve agriculture between 2015 and 2025, and the Africa Regional Nutritional Strategy for the same period, which reiterates the food to adequate food [64, 67].

Various African countries safeguard their citizens and residents' right to food through national legal frameworks that protect their right to grow food or access adequate, affordable, and nutritious food. Kenya, for instance, enforces the right to food as held by the ICESCR through a constitutional provision that recognizes every person's freedom from hunger and right to have sufficient and quality food [108]. Similarly, the Constitution of South Africa recognizes the right to food through provisions

that guarantee adults and children access to sufficient food [108]. Such provisions are typically implemented as part of efforts to promote overall food security through strategies that address the primary causes of food insecurity such as increased investment in agricultural infrastructure, establishment of networks of agricultural extension services, and the adoption of economic policies that increase the purchasing power of households to increase both access to food and its availability [213]. However, the accountability mechanism of the Malabo Declaration is relatively weak and this restricts the governments to a great extent in their ability to address unmet commitments. Despite the fact that it emphasizes agricultural interventions, it has no consideration for drivers such as incomes and social protection measures that shape the foods security [64, 67]. This could be made more effective by increasing the declaration's scope regarding the acknowledgement of accountability beyond the health care organization to socio-economic performance indicators, as well as by focusing on the reinforcement of accountability through regular assessments and evaluations. The Africa Regional Nutritional Strategy also faces similar issues of inadequate resources, and lack of linkages with other sectors like education and health. This could be improved when food insecurity in urban areas is tackled and better funding is acquired food [64, 67]. In addition, enhancing these frameworks, the support for the decentralized food system that encourages local communities and small farmers can minimize the reliance on outside aid and contribute to the development of the resilience. By forecasting the development of the African economy and strengthening the African Continental Free Trade Area (AfCFTA) policies with the help of modern technologies like blockchain and precision agriculture, Africa can contribute to increased food distribution and stability in the continent.

The above international, regional, and national legal frameworks adopted to guarantee the right to food have not achieved their overarching aim of ensuring universal availability, affordability, accessibility, and sustainability of food in Africa as made evident by the prevalent food insecurity in the continent. Consequently, the right to food is being violated across the continent despite ongoing efforts to promote food security. This situation raises questions about the effectiveness of the existing legal frameworks. The ineffectiveness of these frameworks is attributed to several factors. These include limited investment in sustainable agricultural practices, such as irrigation, and insufficient research in agriculture. Economic challenges, such as slow growth and high inflation, also play a role. Rapid population growth and climate change further exacerbate the situation. In addition, poor infrastructure and slow sector development hinder

progress. Poor policies and prevalent corruption across the continent intensify the impact on food security [213]. Addressing these challenges could potentially reverse the prevailing food insecurity in Africa, driving the continent towards the protection of the right to food.

**Socioeconomic factors affecting the realisation of the right to food in Africa**

**Poverty, inequality, structural injustice, and their impact on food access and availability**

Poverty is a state that results in the incapacity of an individual or a family to fulfil the standard living requirements. Moreover, poverty results in food insecurity as it involves the deprivation of a satisfactory quality of life [154]. Poverty stands as a significant contributing element to household food insecurity and directly influences the ability to access food, as shown in Table 2. Various overarching factors like economic conditions, governance issues, conflicts, illiteracy, and diseases that lead to poverty are complex and widespread across diverse African nations [146]. In Ref. [127] proposed that poverty, lack of food access, low income, hunger, unemployment, and malnutrition are interconnected since they violate basic human rights and challenge human dignity and legal frameworks. These factors have a direct impact on guaranteeing the right to adequate food and poverty reduction. Poverty correlates with food insecurity and hunger, particularly in rural and female-headed households [127]. There exists a positive correlation between poverty and food insecurity.

The poverty experienced by rural households is exacerbated by the prevalence of female-headed households in rural regions, where women are more susceptible to poverty due to their general lack of employment opportunities, limited economic prospects, and gender-based wage disparities [9]. Though more frequent it has been noted that female-headed households are more vulnerable to poverty, however, in male-headed house hold, it is not necessary better since food insecurity can affect any

household where the burden falls on a single breadwinner. Flatø et al. [71] identified factors that heighten the vulnerability of female-headed households to poverty: (i) women typically earn less, own fewer assets, and have restricted access to productive resources like land, financial assets, and technology compared to men, (ii) in the absence of a male provider, female household heads often bear the sole financial responsibility and face a heavier burden of dependence; and (iii) women heading households without additional adult assistance are burdened with fulfilling both domestic responsibilities and the role of breadwinner. However, collaboration between the couples also contribute to the reduction of food insecurity as the joint provision of income and demand in goods and services of household resources also contribute to offsetting the impacts of food insecurity. In addition, women in rural areas encounter challenges in accessing productive resources, negatively impacting their right to food, which is contingent on availability, accessibility, and sufficiency. This is not only about one family member being the breadwinner but the representation of women’s employment situation in the labour market where despite employers offering men and women the same paid jobs, women are usually paid less. According to Quisumbing et al. [162], sustainable food production is a fundamental aspect of food security. Nonetheless, women in rural settings frequently lack access to essential natural resources crucial for sustainable food production. Land plays a pivotal role in rural livelihoods for agricultural activities, home cultivation, and natural resource utilization, making its availability vital for households [105]. Consequently, equity in responding to women’s needs for productive resources and labor market opportunities as well as ensuring that women own assets, and are hired fairly can enhance food security outcomes in the regions.

Dungumaro [44] noted that the increasing burden of financial and caregiving responsibilities placed on mothers has contributed to the rise in female-headed households. Female household members, often solely

**Table 2** Socioeconomic factors affecting the realisation of the right to food in Africa

Socioeconomic Factors	Impact on the Right to Food in Africa
Poverty, Inequality, and Structural Injustice	This limits the capacity of individuals to access adequate food, further exacerbated by factors such as lack of employment opportunities, conflicts, illiteracy, and diseases. Female-headed households in rural areas are particularly vulnerable due to their limited access to resources like land
Climate Change and Environmental Degradation	Climate change poses a serious threat to agriculture and food production, leading to extreme weather events like floods and droughts. Small-scale farmers are especially vulnerable to these impacts. Without mitigation efforts, food production is expected to decline significantly, exacerbating food insecurity
Urbanization, Population Growth, and Changing Dietary Patterns	This shifts the dynamics of food demand and consumption, resulting in increased demand for certain food categories, while traditional crops may face decreased demand. Urban populations exhibit lower levels of food security compared to rural areas

responsible for family upkeep, frequently struggle to meet the household's food requirements. These circumstances lead female-headed households to face elevated levels of poverty and vulnerability [179]. To address this, it is recommended that targeted access to agricultural resources including land, credit and inputs would help in reducing resource constraints that confront the female-headed households. The productivity could, therefore, be greatly boosted by such policies as provision of rights to owning land where the woman is recognized as having such rights and partage financing services where credit facilities have been provided for women [12]. Moreover, learning and enhancement of education and agricultural knowledge of women can enhance the chances of female farmers to adapt good farming practices, in turn, improving efficiency and productivity. Social protection measures including the conditional cash transfer and food transfers could also help to attend to immediate demands of female headed households thus decreasing their susceptibility [136]. In addition, supporting women to engage in and form groups for purposes of cooperative farming and undertaking collective action would allow them to secure market linkages, access to capital, and would enhance their negotiation capacity in the market systems hence improving their livelihoods and food security [117].

#### **Climate change, environmental degradation, and their effects on agriculture and food production**

Over the years, the issue of adequate food security has persistently remained a crucial topic for deliberation. The diminished productivity of food predominantly stems from fragmented land ownership, excessive dependence on rain-fed agriculture, the impact of climate change, limited access to resources, and a weak economic foundation [212]. Numerous research studies have identified an adverse relationship between rising temperatures and diminishing rainfall concerning food security in Africa [40, 45, 46, 111, 119]. To alleviate the detrimental effects of weather phenomena on food security, climate adaptation measures such as sustainable watershed management practices, crop diversification, early maturing crop varieties, and irrigated agriculture have been proposed [40].

Developing nations, particularly African countries, have been labelled as vulnerable to the severe consequences of climate change, as tropical regions are expected to bear the brunt of its impacts as highlighted by other researchers [7, 97]. Climate change-induced extreme occurrences like floods and droughts pose significant threats to agriculture, a sector crucial for employment and food supply in Africa, making it highly susceptible to climate variations. The adverse effects

of climate change on agriculture have already been observed in numerous global regions due to the escalation of extreme weather patterns [101, 193]. Furthermore, Roudier et al. [167] underscore that the primary negative consequence of climate change results from the amplified temperatures, surpassing changes in precipitation as predicted by climatic models. The Food and Agriculture Organization [62, 65] identifies five principal drivers of climate change that will impact the agriculture sector, varying in intensity and significance across different regions: temperature elevation, precipitation alterations encompassing rainfall and snow, upsurge in extreme events like floods and droughts, rising sea levels, and elevated atmospheric carbon dioxide levels. Consequently, it is imperative to evaluate the effects of extreme events such as floods and droughts triggered by climate change, particularly on agricultural output and food security.

The correlation between climate change and food security emerges from the influence of climate change on the climatic conditions essential for optimal food cultivation. Nevertheless, research indicates that the impact of climate change will not be uniform across all nations, with equatorial regions like sub-Saharan Africa projected to endure the most severe repercussions due to their geographical positioning [52, 70]. Consequently, countries already grappling with food insecurity are likely to face exacerbated challenges in the future unless immediate actions are taken to mitigate climate change and adopt climate-resilient agricultural practices. Traore et al. [193] further emphasize that food production is anticipated to decline significantly in Mali and other Sub-Saharan African countries due to the current and projected climate change trends. Small-scale farmers are particularly at risk unless they implement early planting and recommended fertilizer application rates to enhance food sufficiency in these regions. The persistent impact of climate change is expected to continue causing floods, exacerbating desertification, and disrupting agricultural seasons [97].

Sundström et al. [186] assessed among others the future threats of environmental degradation and climate change on food security for the 2012–2050 period and found that food security is threatened by climate change and environment degradation, although with some varying degrees based on climate zone, public stewardship, and economic strength of countries. There are several African countries that have been able to come up with good strategies in dealing with climate change challenges that should be widely adopted. The Sustainable Land Management Program (SLM) in Ethiopia helps to rehabilitate the agricultural land by developing terracing, reforestation and water conservation. This process has increased the yields in agriculture and food security as well as in the rural sector. This initiative proves that

further implementation of sustainable land management practices at regional levels can successfully be scaled across Africa, particularly in the zones that are suffered from land degradation and drought [35]. In Kenya, the use of Climate-Smart Agriculture (CSA) has shown promise. The government together with development partners provided farmers with drought t-resistant crop varieties and appropriate irrigation techniques due to climate change. Such practices have improved productivity, and preparedness to climate variations. Since CSA is successful in Kenyan farming practices, extending those practice in other Arid regions of Africa could go a long way in building up the agricultural resilience [203]. In Senegal, the Great Green Wall project seeks to restore vegetation through planting of trees in Sahel with a view of protecting it from desertification. It is a very large scale project that apart from increasing fertility of the soil provides employment and boosts local markets [79, 147]. The sustainability aspect is that other nations in the Sahel and other regions can mimic the actions in their environmental and economic rehabilitation. These strategies show that climate adaptation solutions can be implemented at a large and effective scale in Africa when endeavours take into consideration cultural, geographical and political specifications of the region, backed up by good governance, and involving partnership between governments, people and organisations of the global community.

#### **Urbanization, population growth, and changing dietary patterns influencing food security**

Ruel et al. [169] substantiated that the geographical distribution of poverty is swiftly transitioning from rural to urban regions, resulting in a high prevalence of food insecurity and various forms of malnutrition among urban inhabitants. Of particular concern are the rapid surges in overweight and obesity in urban areas, alongside the persistence of undernutrition and deficiencies in micro-nutrients. De Bruin et al. [33] discovered that the process of urbanization gives rise to an evolving and increasing demand for food, leading to direct and indirect alterations in land use, as well as intricate shifts in market connections. Research indicates that a diverse array of favourable circumstances can foster the emergence of prospects for rural livelihoods within this framework. Urbanization plays a role in reshaping the spatial dynamics of food demand and influencing consumer choices, thereby altering the production, distribution, and consumption patterns of food. These transformations are impacting agrifood systems in a manner that poses both challenges and opportunities for ensuring universal access to cost-effective nutritious diets [68].

In conjunction with urbanization and escalating incomes, households tend to consume larger and more varied quantities of food, encompassing dairy products, fish, meat, legumes, fresh produce, and processed items [42]. This trend, coupled with population expansion, implies substantial escalations in the output and provision of certain food categories (such as meat, dairy, fresh fruits and vegetables, wheat products, and highly processed foods) to meet heightened demands. Consequently, as urban populations increase, there is a significant upsurge in the overall volume of food that agrifood systems must generate, process, and disseminate over time. Concurrently, there might be sluggish growth or even decreases in the demand for other food items like traditional grains, maize, and tubers [68]. Macalou et al. [122] indicated that urban-dwelling households exhibit lower levels of food security compared to their rural counterparts. The outcomes from the ordered probit model also validated that urban households experience higher levels of food insecurity (mild and moderate) in comparison to their rural counterparts. The migration from rural to urban settings contributes to a reduction in the rural labour force and expertise, directly impacting food production [142].

In Ref. [149] discovered a negative relationship between food security and population growth in Nigeria within his research. In Ref. [159] also identified that an enhancement in productivity, whether through increased production or expansion of cultivated lands, has a beneficial impact on food security at the macro level. The rise in population leads to a higher demand for food, while income growth influences consumption behaviours [134]. The study by Miladinov [134] demonstrated a strong correlation between the prevalence of undernourishment in these nations and the growth of rural and urban populations. The study revealed a positive effect of rural population growth on undernutrition across all three categories of countries, particularly notable in upper-middle-income nations. Conversely, the adverse impact of urban population growth on undernourishment was most pronounced in upper-middle-income countries. Moreover, the outcomes of fully modified ordinary least squares analysis indicated that alterations in undernourishment prevalence are predominantly tied to prolonged changes in rural and urban population growth. The Difference in Difference (DiD) estimation solely validated the negative causal relationship between rural population growth and undernourishment prevalence in the selected countries.

Morales and Berkowitz [138] articulated that food and nutrition insecurity has been linked with obesity and unhealthy dietary patterns, both of which might result in detrimental health outcomes. There is substantial

evidence supporting the negative association between food and nutrition insecurity and dietary choices. The correlation between food and nutrition insecurity and obesity is most prominent among women, while the findings for men and children are inconclusive. Limited evidence exists regarding the long-term effects. Research findings have been largely inconclusive, leaving uncertainty on how to effectively assist food-insecure individuals in improving their dietary habits and weight. Previous studies examining the connection between food and nutrition insecurity and dietary patterns have connected food and nutrition insecurity with reduced consumption of nutritious food groups and subpar diet quality, particularly in terms of fruit and vegetable intake [85].

The option of urban agriculture and vertical farming shows signs of providing the much needed solutions to food security in the expanding African cities. Urban agriculture, which entails production of food crops and rearing of livestock in the vacant lands, rooftops and communal gardens, can increase the amount of food available in the urban areas, decrease food hauls from other centers and cushion the effects of hiking food prices [152]. This practice can help people in urban areas to grow fresh produce closer to them, thereby cutting on the time and costs of transporting produce to consumers hence making fresh produce more easily accessible especially to the low income earners [118]. Cities such as Dar es Salaam and Kampala for instance have benefitted from urban agriculture by supplying cheap vegetables and livestock food to households [49].

Vertical farming is another technique that has high-technology solutions for all kinds of farming that focuses on growing crops from one stacked floor on top of another. Through controlled systems of hydroponic and aeroponics techniques, vertical farms practices require small spaces and water to produce maximum yields and it is valuable in areas with little arable land such as cities [135]. It is in such cities like Johannesburg where innovations in vertical farming for small scale farming are being developed to meet the need of densely populated areas and year round production [137]. Such changes could be extended to feed the increasing population in African cities that are rapidly being subjected to urbanization. In this regard, both urban agriculture and the vertical farming systems benefit the food security of the African cities by reducing the over reliance of food imports and promotes job creation and economic development. However, such practices have to be recommended and developed at a larger scale and in that sense, governments have to invest in infrastructure, policy, as well as technical training for urban farmers.

Another factor that may be attributed to food insecurity mostly in the urban areas as well as the issue of

people abandoning farming activities is the issue referred to as the rural drift or the rural exodus. There is extensive literature exploring this trend of migration and its causes and effects especially with relation to the developing world where the rural and urban drift is endemic [17]. Another factor as to why there is rural–urban migration is because of the problems of unemployment, low incomes or lack of decent job opportunities in the rural areas. This is especially the case in Africa where many rural households have been found to suffer from market access, physical infrastructure and basic social amenities, including quality education and healthcare. This has led to a general decline of farming as a means of income generation and more so the youth have shifted more towards urban centers in search of other means of income [41]. As stated by Tacoli [188], rural people also have a perception that in urban areas they will have better chances of getting employment and hence better lives. This migration has led to the cases of replacement of arable land with other uses hence reducing the amount of food production in the rural regions. The issues of food insecurity are, therefore, compounded by abandonment of farming through increasing rates of farmland this is because both the rural and urban populations are affected. In countryside people are not often available to farm and work on fields hence the diminished output, while in urban areas, so many people are moving in that they consume a lot of food despite the availability of few resources to feed them. Such dynamics informs the growing phenomenon of food insecurity in the urban centres which are evident in many African nations [123]. Besides the effects which refer to the direct impact on the production of new food, the rural exodus leads to the destruction of the source of historical and traditional understanding of agriculture. As the population decreases due to people shifting to the urban areas to seek employment, and due to poor transfer of agricultural knowledge from a parent to child, the productivity of the land decreases in the rural settings. When people migrate from these areas, they destabilize the rural structures and hence it becomes almost impossible to embark on large group farming activities and promote sustainability in farming [120].

Factors also include climate change, because shifting weather patterns, droughts and floods are making farming more and more unsustainable across the world. Whenever climatic change affects agricultural productivity in the rural areas and the people are forced to abandon agriculture in search of other jobs, they relocate in the urban centers thus relinquishing unproductive lands [45, 46]. In urban areas, there is congestion hence leading to inadequate houses, poor livelihoods without any means of acquiring food, thereby increasing food insecurity. Large numbers of people living in urban areas exert

significant pressure on the urban food systems most of which are hardly able to satisfy the escalating demands. This is especially so in cities that are least prepared to accommodate such a population increase hence adopting to informal sectors with poor access to cheap and healthy foods [201]. Therefore, there is need to encourage policies that would enhance rural development and increase productivity of agriculture. Efforts towards constructing rural infrastructure, providing market outlets and after advancing in agriculture techniques people would be encouraged to stay in the rural areas hence control on rural drainage and also sustenance of food. Also, it leads to the increased populations and, therefore, the need to consider the available and sustainable methods of producing food to feed the vast urban population (Omotoso et al., 2020)..

### **Strategies that can be used to promote equity and justice in ensuring food security in Africa**

#### ***Land tenure and agricultural productivity***

The increasing demand for land underscores the necessity of establishing secure tenure rights to ensure fair land allocation, support livelihoods, and enhance food security [92]. Concerns among vulnerable populations and small landholders may arise regarding the potential loss of their land rights due to encroachment and government appropriation [73]. Instances of large-scale land acquisitions often take place in regions with deficient land tenure systems [36]. The presence of secure land tenure rights has the potential to improve the availability, access, and utilization dimensions of household food security [91].

#### ***Access to land and land rights about food security***

Limited land access and insecure tenure rights may undermine food security in Africa, where more than 70% of the population relies on land and natural resources for their livelihood [4]. The hindrances of rent-seeking and the high expenses related to land registration hinder the acquisition of legal titles, leading to a resurgence of customary land tenure and the utilization of informal land rights documents [96]. The establishment of the Voluntary Guidelines on the Responsible Governance of Tenure of Land in the Context of National Food Security (VGGT) [64, 67] and the Frameworks and Guidelines on Land Policy in Africa [197] serves as a framework to direct the management of land tenure towards enhancing food security.

Mendola and Simtowe [131] as well as Mueller et al. [140] discovered that access to land resulted in increased incomes and improved food accessibility for beneficiaries of land acquisition programs in Malawi. Santos et al. [175] observed no significant correlation between

government land allocation, registration initiatives, and the consumption of nutritious food in rural West Bengal. Studies based on qualitative research have demonstrated that households view land as a crucial means to offset monetary expenses on food purchases in rural West Bengal [175]. Several research works have linked higher dietary diversity and increased per capita food consumption with larger land holdings in India as reported by [87] and Myanmar [164]. Nonetheless, most food-insecure households in rural India possessed little to no agricultural land [80]. Other research studies have indicated enhanced per capita food expenditure and food security through the possession of formal land title deeds in Ethiopia [75] and Malawi (Ajefu and Abiona 2020). Qualitative assessments of food security projects in South Africa [105] and the utilization of other natural resources such as fishery, pasture, wildlife, and woodland in Zambia [132] have showcased the potential of land tenure to enhance food security.

Inequalities in land rights prevail on a global scale, encompassing both formal and customary contexts, attributing to the varying strengths of land rights held by different societal groups. Weaker forms of these inequalities tend to impede tenure security, diminish land utilization, and jeopardize the food security of those reliant on the land for sustenance [144]. Nara et al. [144] highlighted that feeble and unequally distributed land rights result in uncertain tenure durations and reduced farm sizes, influencing farmed areas, agricultural output, food availability, accessibility, and ultimately food security. Farmers have expressed the necessity to adopt coping mechanisms to mitigate the repercussions of unequal land rights.

#### ***Smallholder farmers and the role of land tenure security***

Land tenure security is paramount for rural transformation, diversification, increased agricultural production, and environmental sustainability [129]. According to Holden et al. [92] and Muchomba [139], land tenure security refers to the assurance that individual land rights will be acknowledged and safeguarded in the event of private investor intrusion, expropriation, or government redistribution. The dimensions of land tenure security encompass *de jure* (officially sanctioned by government authority), *de facto* (widely recognized tenure security), and perceived tenure security (individual subjective assessment of their land rights situation) [163]. When land tenure security is established through well-enforced rights, it could stimulate investments, and facilitate credit access, and land transfer, thereby alleviating poverty and fostering economic progress [199].

Ibrahim et al. [95] demonstrated that smallholders who obtained land freely were less likely to exhibit high



Household Dietary Diversity Scores (HDDS), which could be attributed to the lack of long-term security and investment incentive. When land is obtained freely, there may be a lesser sense of ownership or permanence, leading to reduced investment in agricultural practices that improve food diversity. Conversely, individuals owning family-inherited plots tended to have more varied diets and possess greater assets, as inherited land often carries a stronger sense of stability and long-term investment potential. Smallholders with inherited land documentation were more inclined towards food security, indicated by lower food expenditure share, higher HDDS, and the Livelihood Coping Strategy (LCS). Moreover, the perception of being able to mortgage land for a loan was stronger with inherited land certificates compared to informal documents, allowing for better agricultural practices and land management, which can improve food security outcomes. The study by Ibrahim et al. [95] emphasized the importance of formal land governance in acknowledging land ownership through inheritance and recognizing informal land documentation to bolster smallholder food security through enhanced dietary diversity and reduced food expenditure shares.

Although smallholder farmers play a dominant role in food production within developing nations, they represent a significant portion of food-insecure individuals and constitute a large percentage of the world's impoverished and malnourished population [57]. Limited access to and control over land among smallholders may impede their ability to access innovations and financial resources. Nara et al. [144] highlighted the presence of food insecurity among smallholder farmers (settlers/migrants) with fewer and weaker land rights compared to landowners with stronger and more numerous rights. In Ref. [182] proposed that lower land tenure security did not impact farmers' satisfaction with the crop program, as many emphasized that the most crucial aspect was the continuous increase in their harvest yields.

#### ***Enhancing agricultural productivity and sustainable farming practices***

In Ref. [151] posited that the assurance of food security has emerged as a pivotal concern for nations with varying levels of economic advancement, with the agricultural sector assuming a crucial role in enhancing food availability. Nonetheless, the encouragement of investments in agricultural infrastructure and extension services, coupled with the implementation of measures aimed at bolstering the purchasing power of households, particularly those residing in rural areas, are perceived as fundamental catalysts for enhancing both food availability and access. The sustainability of food security is impacted by climate change and the

degradation of natural resources [121]. Similarly, factors such as population growth, rapid urbanization, shifts in dietary patterns, and economic progress intensify competition for limited land resources, thereby influencing food security [93]. The reinforcement of land tenure governance through the provision of secure tenure and equitable land access can foster sustainable agriculture and food systems [88]. In contemporary discourse, land reforms, particularly the establishment of secure land tenure, are acknowledged as primary mechanisms for enhancing agricultural productivity and food security on a global scale [75]. Furthermore, such reforms are recognized as pivotal contributors to a nation's advancement, development, social harmony, and poverty alleviation, among other developmental benchmarks [199].

Global agricultural systems must enhance productivity and minimize inefficiencies. Sustainable agricultural methods and food systems, encompassing both production and consumption aspects, should be approached from a comprehensive and integrated standpoint. Enhancing yields on existing agricultural lands, including the restoration of degraded lands through sustainable agricultural practices, could alleviate the pressure to clear forests for agricultural purposes. Effective management of scarce water resources through improved irrigation and storage technologies, in conjunction with the development of drought-resistant crop varieties, can play a role in maintaining productivity in arid regions. Arresting and reversing land degradation will also be crucial for meeting future food requirements [195]. The global population is forecasted to reach 9.7 billion by 2050 and 11.2 billion by 2100. Meeting the escalating food demands of this exponentially growing population necessitates a substantial increase in food production. Agricultural activities on both terrestrial and aquatic ecosystems have adverse impacts on the planet's ecological balance. The combined repercussions of climate change, land degradation, loss of croplands, water scarcity, and pest infestations are major contributors to agricultural yield losses of up to 25% (Dhanarajan, 2017). Consequently, a paradigm shift in agricultural development towards sustainable food production and security is imperative through initiatives such as the green revolution and eco-friendly approaches. Thus, agricultural practices must be geared towards sustaining the capacity of farmlands to yield food indefinitely while ensuring sustainable impacts on the broader environment. The forthcoming and current agricultural challenges vary based on geopolitical and socioeconomic contexts. Hence, sustainable agriculture needs to be all-encompassing, adaptable, and flexible over time to meet the demands of food production [38].

### Gender equality and women's empowerment

The concept of gender inequality is not only a key element of basic human rights but also an essential aspect of sustainable advancement. Regrettably, within numerous global regions, women encounter substantial impediments when endeavouring to acquire and oversee vital productive resources, encompassing land, water, inputs, technologies, loans, and market access [20]. Moreover, female's opinions are frequently pushed aside to the background, reducing their ability to shape decisions that have a significant impact on their well-being, food security, and overall quality of life. These disparities inflict not only harm upon female farmers but also compromise the attainment of Sustainable Development Goals and the efficacy of agricultural endeavours [5]. A significant gender inequality in agriculture is spotlighted by the Food and Agriculture Organization. Despite women making up 43% of the agricultural workforce, they own less than 20% of global agricultural land and face various obstacles, driven by cultural norms, in accessing credit, education, and decision-making roles [32]. Addressing these disparities is crucial for empowering women, improving food security, reducing poverty, and supporting environmental sustainability [32]. The potential benefits include increased agricultural productivity, reduced hunger, and improved well-being for women and their families, along with more sustainable resource use and resilience to climate change [160]. Hence, the empowerment of women farmers in agriculture is of utmost importance in our combined effort to achieve food security and sustainable development. It stands as both a moral obligation and a sagacious investment [20].

When woman farmers are empowered through equal access to resources, decision-making opportunities, and fair compensation, and are given the authority to instigate positive transformation to unlock their maximum potential. This undertaking extends beyond equity alone; it's crucial to improving food security and sustainable growth. It corresponds to the basic human right to have enough to eat, which implies universal provisioning to an acceptable minimum quantity of quality food, as proclaimed by the Universal Declaration of Human Rights, the Convention on Global Food Crisis or the International Covenant on Economic, Social, and Cultural Rights, and the Voluntary Guidelines for Food Security [136]. Implementation of policies and initiatives that are sensitive to gender considerations, accommodating both the unique requisites of men and women in food security endeavours, stands as an imperative for upholding the right to food. This necessitates the proactive addressing of the underlying determinants of gender inequality, encompassing prejudice and violence, through multifaceted strategies [14]. These strategies must

include collecting gendered data, formulation of legal frameworks, gender equality in participation, increased awareness on gender dimensions, creation of accountability mechanisms and establishing. To realize food security and sustainable development for all, the imperative to empower women farmers is not solely a moral prerogative, it is a pragmatic necessity [74].

### Food systems transformation

A food system encompasses the complex network of activities, processes, and interactions involved in the production, processing, distribution, consumption, and disposal of food. It includes various components such as agricultural practices, food supply chains, market dynamics, and consumption patterns, along with the socio-economic, environmental, and policy contexts that influence these components [72]. A sustainable and resilient food system integrates environmental stewardship, social equity, and economic viability, aiming to ensure that food is produced and consumed in ways that do not deplete natural resources, minimize environmental impact, and support the well-being of all stakeholders. This system is designed to withstand and adapt to shocks and stresses, such as climate change and economic disruptions while maintaining the ability to provide safe, nutritious, and accessible food for current and future generations [59, 60]. It necessitates substantial adjustments and enhancements in the institutions, infrastructure, regulations, markets, and resources that underpin these systems [58]. This food systems transformative endeavour is a complex undertaking, demanding collaboration among diverse stakeholders and sectors, as well as a comprehensive and systematic approach that considers the intricate interplay and trade-offs within food systems [116]. To facilitate nations in their pursuit of modernized food systems by the year 2030, the World Bank Group has established a dedicated Umbrella Multi-Donor Trust Fund known as Food Systems 2030. The aim is to support individual welfare, environmental benefits, and economic prosperity by increasing alternatives for small- and medium-sized enterprises, facilitating access to markets and resources, and developing bigger, diverse, inclusive markets (The World Bank, 2024) Food system transformation endeavours to address the challenges and inherent trade-offs encountered by current food systems, with the overarching goal of advancing the well-being of both humanity and the environment [168].

Some of the goals of food transformation are:

#### Sustainable and resilient food systems for ensuring the right to food

A sustainable and resilient food system for nutritious diets has been recognized as the primary focus of the six

action pillars for the United Nations Decade of Action on Nutrition [68]. Sustainable food systems are crucial in achieving advancement on each of the 17 Sustainable Development Goals. Food systems are at the heart of the 2030 Agenda for Sustainable Development, which was established by the United Nations to eradicate poverty and hunger, combat climate change, and preserve our natural resources [187].

The food system transformation seeks to align with human rights, environmental preservation, and well-being. Highlighting the accessibility, adequacy and acceptability for all, access to food is considered as the basic human right itself. Sustainable food systems play a crucial role in ensuring food security, nutrition, and the conservation of ecosystems and natural resources for future generations [26]. They aim to meet current dietary needs without jeopardizing the ability of future generations to do the same while addressing environmental challenges like greenhouse gas emissions, biodiversity loss, soil degradation, water pollution, and deforestation [198]. The significance of resilient food systems lies in their capacity to protect the right to food for all, as they are adept at withstanding a spectrum of shocks and stresses, ranging from natural calamities and conflicts to pandemics and market fluctuations [115, 216].

Food systems have been linked to the three key components of sustainability which are environmental, social, and economic [47, 68]. Food systems start at production and end at consumption, with manufacturing and distribution networks positioned in between. These networks include various processes and actors involved in transforming raw agricultural products into food and delivering it to consumers. To maintain sustainability, food systems must evolve by integrating practices that minimize environmental degradation, optimize resource use, and enhance social equity throughout the entire chain to ensure they remain sustainable over time [50]. Even numerous components of the existing food production systems, according to scientific evaluations stimulate the loss of the preservation of biodiversity, the deterioration of land, soil, and water quality, as well as climate [89, 100, 202]. The COVID-19 epidemic made the food system's problems worse and revealed its vulnerabilities. The most obvious of them was the fact that there are severely vulnerable individuals all around the world whose ability to eat a healthy meal was jeopardized by the crisis. In addition, 149 million children are severely stunted. 82 million people across the globe experience food insecurity, and an estimated 2 billion people suffer from micronutrient deficiencies internationally [22, 104]. It became clearer and clearer that our food system required a profound and radical transformative shift to change consumption habits to transition to sustainable and healthful diets, and

to guarantee that we get back on track to end hunger, to guarantee the improvement of equality and shared ideals among producers, society, enterprises, and consumers; ensuring that natural resources are not only conserved but also renewed; and to make sure there are intentional and coordinated measures made to strengthen resilience to the shocks and stresses that are only expected to get worse as a result of climate change damage [104].

Essentially, resilient food systems could be flexible, responding effectively to adverse conditions and bouncing back quickly—if not unscathed, then with minimal loss of effectiveness. Furthermore, they have an impact on the lives of all players in the food systems such as farmers, consumers, policymakers, scientists, civil society, and businesses and reduce their dependencies and capacity to cope with disruptive impacts and risks [177]. Sustainability and resilience in food systems are intricately interconnected and interdependent facets. An adaptive or resilient food system, for instance, could improve sustainability through maintaining productivity and maintaining biological and cultural diversity under stress and strains. Conversely, a sustainable food system can bolster resilience by diminishing susceptibility to shocks and stresses [141]. As such, any effort at changing the food system requires adopting a systems approach that carefully assesses the interactions between different goals, players, spatial scales, and settings in all facets of life and society. A holistic viewpoint acknowledges the intricate and dynamic nature of food systems, which are replete with numerous feedback loops and nonlinear connections [98]. Simultaneously, a systemic perspective recognizes that food systems are embedded within larger social, economic, political, cultural, and environmental systems that both shape and are shaped by them. This integrated method of analysis is crucial to grasp and transform the opaque relationships governing food systems and to advance tangible advances of change [10].

#### ***Enhancing value chains, post-harvest management, and market access***

An agri-food chain of value is a collection of interconnected processes that function to develop an agricultural product from beginning to end. Using the Resilient Food Systems Program (RFS) initiatives as a model, an agri-food value chain strategy involves developing and putting into place interventions that deal with issues and problems that are present in certain linkages of an agricultural production system, from input producers to end markets [165]. The food systems known as nutrition-sensitive value chains (NSVCs) are better positioned to enhance diversity in diets and quality of nutrients, hence boosting nutrition. They are structured in a way that will increase the availability of nutrient-dense foods, their

nutritional worth, and the demand for them along the supply chain [34]. Based on the research investigations by [126, 207] as regards NSVCs and African indigenous vegetables (AIVs), the realization of post-harvest management prospective impact for transformation on the local value chains can be achieved through such strategies as minimizing food losses in terms of both quantity and quality, the improvement of food safety, increasing vegetable storage efficiency and shelf life, and improving food nutritional quality by maximizing preservation techniques [53].

Improving the efficiency, quality and sustainability of food production and consumption is key to transforming food systems. However, this initiative depends on building links between the different players of the supply chain, ranging from farmers, producers, and traders to retailers and final consumers. Value chains play a significant role in this context, offering avenues for improvement [83]. Components of potential value chain improvement may include increasing productivity, reducing operating costs, increasing levels of quality and safety, expanding product offerings and market access, and enhancing coordination and cooperation at the level of market players. Value chains, when optimized, render food systems more consumer-responsive, competitive in both local and international markets, inclusive of smallholders and marginalized groups, and resilient in the face of shocks and stressors [189]. Adding to that is post-harvest management, where all the various operations are involved in managing agricultural products after harvest. This involves sorting, grading, packaging, storing, transporting, processing, marketing, and distribution [18]. In this context, the goals are to mitigate food losses and waste throughout the supply chain, enhance or maintain the quality and safety of food products, and bolster the pricing and income of such products [18].

Efforts in value chain enhancement and post-harvest management can result in numerous benefits for food systems, including improved food security and nutrition outcomes, reduced environmental impacts stemming from food production and consumption, heightened accessibility, and availability of food for consumers, and the creation of income and employment opportunities for stakeholders within the chain [151]. However, to truly harness these advantages, facilitating access to markets is paramount. Reliable and adequate market access promotes food security, raises earnings, and increases productivity. It can aid in alleviating hunger and poverty in places where there are producers of food if suitable steps are implemented to lessen market dangers and unfair market dominance [99]. Many rural producers and smallholder farmers frequently encounter significant barriers and restrictions when trying to enter markets to sell their

products due to their inaccessible location, expensive transit expenses, and little expertise [99, 165]. However, market access is influenced by a lot of things, including hard and soft infrastructure, policies, regulatory frameworks, standards, trade agreements, informational systems, and market institutions. This access has significant supply chain impacts relating to cost, distribution, product quality and variety for both suppliers and end users [200]. Boosting access to markets, therefore, is a powerful tool for improving resource allocation efficiency, fostering economic growth and development, unleashing innovation, and adding value in terms of a wider array of products and services, thus raising consumer welfare. Strategies for improving value chains, post-harvest management techniques, and market access complement one another, offering opportunities to optimize food systems in multiple ways. These strategies can be instrumental in realizing the overarching objectives of inclusive, environmentally sustainable, and resilient food provision for all individuals [151].

#### **Promoting local food production, agroecology, and biodiversity conservation**

Agroecology as a technique has been identified as a strategic method for addressing, combating, or adjusting to climate change and promoting long-term production [24]. This is accomplished by incorporating ecological and biodiversity mechanisms and procedures into food production, lowering the quantities of external inputs and adopting organic or green alternative options [161]. By infusing ecological principles into agricultural practices while upholding social equity and diversity principles, agroecology accentuates ecosystem services, encompassing benefits such as food production, soil fertility, pollination, pest management, and cultural values [200]. Employing agroecological techniques like crop rotation, diversification, organic farming, integrated pest and nutrient management, and reforestation augments the quantity and diversity of these services on agricultural plots. Aside from mitigating biodiversity depletion and curtailing water contamination, this approach reduces dependence on agrochemicals, synthetic fertilizers, and non-renewable energy sources [208]. Agroecology becomes the catalyst for change in the food system and makes farming environmentally, economically, and socially viable. It empowers individuals to exercise food sovereignty, deciding the production and distribution of their sustenance, and empowers small-scale farmers to thrive even in the face of challenges like climate change [76].

The Agroecological and Other Innovative Approaches section of [68] and the HLP Report #14 proposes a succinct list of 13 agroecological principles connected to:

reuse and recycling, improving soil quality, protecting the welfare of livestock, the utilization of fewer inputs, biodiversity, synergy (interaction management), economic diversification, and knowledge co-creation that incorporates both local and international knowledge, Justice and fairness, interconnectedness, administration of land and natural resources, social values and diets, and participation [69]. The implementation of the 13 agroecological principles outlined in the Agroecological and Other Innovative Approaches section of the [68] and HLP Report #14 increases local food production and generates numerous benefits for the food system and society in general. This provides a secure source of nutritious provision which is tailored to people's dietary needs, improving food security. Simultaneously, it curtails the transportation distances for food, thereby mitigating greenhouse gas emissions and ameliorating the ecological impact of such emissions on climate change [211]. In addition, local food production creates jobs, revenue, and social capital accumulation among small-scale farmers and other players within the food supply chain, which helps support local economies. It also plays a pivotal role in the preservation of indigenous knowledge and cultural heritage by safeguarding time-honoured farming methods, crop varieties, and culinary traditions [184]. The bolstering of local food accessibility, affordability, nutritional quality, and cultural resonance consequent to the promotion of local food production substantiates a transformative effect on the food system [48]. As a result, producers and consumers have a more sustainable and fairer position due to less reliance on outside supply chains and markets. It also gives more autonomy to small-scale farmers over their resources. The establishment of connections between food producers and consumers through localized production endeavours fosters social cohesion and engenders trust [178].

The significance given to agroecosystems in the transition of sustainable food systems has been connected to their capacity to contribute to sustainability when managed for various advantages, in climate, land, water, and biodiversity for food and famine [39, 51, 128]. In this transition towards sustainability—of human well-being, of natural systems, of ecosystem service provision, and of biological existence itself—biodiversity conservation is central, meaning an effort to protect the Earth's vast array of creatures and plants. It forms the linchpin for sustaining the resilience of agroecosystems and food systems, characterized by intricate interplays between human activities and the natural world for food production [112]. Biodiversity conservation is concerned with protecting these bizarre organisms and their habitats from menaces, including deterioration of habitats, overexploitation, invasion by alien species, pollution, and fluctuations

in climate change as well. Crucially, it underscores the safeguarding of ecosystems and natural resources, the bedrock upon which human requisites for sustenance, clean water, air, and climate regulation repose—a critical facet of the food system's overhaul [13]. This has an array of positive impacts on human well-being, cultural wealth, and the ability to respond to changing conditions through innovation and adaptation—all from diverse ecosystems. Furthermore, it is a manifestation of our moral and existential duty of care towards animals on this planet, as part of the wider community of life we are responsible for maintaining.

According to Mason et al., [124], concerns about sustainable food have often been addressed by agroecology in the setting of family farms or home gardens. Farms do, however, become more resilient via improved biodiversity management and the removal of foreign synthetic inputs, not only through tackling social, economic, and political challenges but also by fostering equality [19, 81]. The implementation of agroecological approaches can be incorporated with conventional farming practices in African countries beginning with practices based on the agro-ecological environments and practices of the region. The preservation of the bio-diversity is one of the key principles in which farmers can grow a variety of crops and different species of livestock for handling soil health problems, improved pest control and productivity [6, 56]. For example, in the semi-arid regions, two crops can be used, in which sorghum or millet are rotated with other crops to overcome the problem of water shortages. In wetter, tropical climates by incorporating trees within crops the practice known as agroforestry helps enhance on biodiversity, decrease on soil erosion, and raise the water holding capacity which is good for the farmer and the environment [176]. Another agroecological approach entails improving on the health of the soil through ways such as use of organic matter. Various technically less advanced farmers in different contexts of Africa can apply natural ways of getting nutrients to the farm soil, such as composting, green manure and the use of cover crops instead of utilizing chemical fertilizers [153]. Legume crop which can be incorporated into cropping systems in West African savannah zones can effectively allow fixing of nitrogen in the soil hence increasing the fertility of the ground and, therefore, the yields [130]. The management practices used by agroecology also incorporate the availability of local materials and locally generated knowledge. Through good ecological agriculture that takes locality into consideration, African farmers are capable of reducing on indigenous pest control methods, enhancing water usage in the dry regions through rain water [166]. Furthermore, combining livestock with crops in mixed farming systems in various regions also

improves on nutrient recycling, minimizes wastage and increases efficiency on the farms. There should be policies that would sustain practicing of agroecology to various farming systems of Africa thereby enhancing proper technical support to farmers and access to markets and produced products. In this respect, various integration of agroecological approaches can assist African farmers to enhance yields, mitigate the adverse impacts of climate change and enhance sustainable production [25].

## **Nutrition and food quality**

### **Addressing malnutrition, stunting, and micronutrient deficiencies**

Nutrition is indeed essential to human health at both individual as well as community levels, which is intertwined with the social, economic, and environmental dimensions of sustainable development. One such pressing issue within the world of nutrition and food quality is malnutrition. This condition arises when one or more essential nutrients are consumed in excess or deficiency, leading to diverse health problems such as stunting, wasting, underweight and micronutrient deficiencies [30]. Malnutrition is among the main factors that contribute to mortality among under-five children [55]. Micronutrient deficits and stunting can both affect one's physical and mental development and growth in kids as well as increase the chance of getting sick [170, 174]. Stunting and micronutrient deficiencies have a complex epidemiology that is known to be influenced by several variables [55, 94].

According to research data from across the globe, latent malnutrition is very common. Development and childhood growth have been negatively impacted for a long time by inadequacies in several micronutrients, including folic acid, iodine, iron, and vitamin A, which have long been a national focus [143]. Understanding the social determinants of health is essential to understanding why there are differences in health outcomes within and across groups. Also contributing to an uneven burden of illness and morbidity are the variations in nutritional consumption, dietary patterns, and dietary quality observed in some populations [155]. The increased incidence of undernutrition, overeating, and obesity (overnutrition) are indications of dietary inequality; or both, under unequal socioeconomic situations like poverty. Low- and medium-income nations (LMICs) are where undernutrition occur more frequently, in contrast to high-income nations (HICs) where overnutrition occurs, as well as in these nations' subpopulations. Under- and overnutrition overlap, which is referred to as the double burden of malnutrition (DBM) may occur at the level of the person, the household, or the entire community [155]. Thus, policies and institutions that prioritize

equity must address them, by altering political will, advocating for change, and strengthening community ability [86, 185]

To address undernutrition, stunting, and micronutrient deficiencies, we need to make sure people have access to enough, diversified, and nutrient-dense foods that match their dietary needs and food preferences. Many people in low- and lower-middle-income countries (LMICs) confront food insecurity, which means a lack of access to adequate and safe food due to reasons, including poverty, war, climate change, natural conflicts, and poor infrastructure. The increased instability then raises the risk of undernourishment, stunting and micronutrient deficiency due to limited nutritious food access [29]. In addition, dietary diversity is constrained for many individuals in LMICs due to cultural, religious, seasonal, availability, affordability, and taste-related factors. This restriction amplifies the danger of lack of nourishment, stunting, and absence of micronutrients by limiting the utilization of micronutrients. Also, the people in low- and lower-middle-income countries (LMICs) suffering from micronutrient deficiencies (deficiency of one or more essential micronutrients in diet or body), have difficulty in getting adequate nutritious food. These shortcomings often arise from inadequate intake and utilization, increased losses or needs, or interactions with other nutrients or substances, all of which can increase the likelihood of malnutrition, stunting, and other health conditions [206].

### **Promoting diversified diets and sustainable food production practices**

A balanced nutritional diet is essential for health, as it provides the body's metabolic requirements without excess or deficiency. Adequate food intake is crucial for maintaining a healthy existence [8]. Malnutrition in all its manifestations can be warded off with a nutritious diet. In addition to noncommunicable illnesses (NCDs), which include conditions, including diabetes, heart disease, stroke, and cancer [8, 107]). In addition to a fast-changing climate, increased hunger and malnutrition, and major socioeconomic disparities, food systems are central to a growing crisis. Meanwhile, there are several chances to make sure that food systems generate nutritious food in a fair manner that supports sustainable development for the environment [59, 60]. Even if a lack of food is a sign of hunger or undernutrition, only the quantity of meals is insufficient to guarantee optimal health [21]. As a result, eating foods rich in vitamins and minerals is crucial to avoid micronutrient shortages [125]. The production of food is just one aspect of food systems (and the ecologies that support it), down to the processing process, food preparation, handling, sale, and consumerism with a variety of crucial results that are essential to achieving

sustainable growth [59, 60]. These outcomes include supplying meals for nourishment, maintaining living conditions, and promoting environmental and social advantages [90].

Agriculture diversification is an initiative linked to economic expansion, which stands out thanks to its steady shift from subsistence farming to a driven by customer demand diverse production structure, by a more diverse and simultaneous movement of farm resources to non-farm enterprises or from low-value to high-value agriculture [37], and prompted by the agriculture industry's sophisticated rural infrastructure and the rapid rate of technological progress [171]. By making a wider variety of foods more accessible to customers, diversifying food production has the primary benefit of improving dietary quality and wellness [84, 169]. By reducing the risks brought on by unfavourable occurrences like extreme weather and climate crises, the second pathway delivers enhanced and maintained food supplies. Thirdly, having lucrative and more steady incomes is an economic benefit of manufacturing a range of goods, which households may employ in times of fluctuating prices to buy a range of food supplies, reducing risks associated with markets [59, 60, 84]).

Strategies to increase the dietary availability of nutrient-rich foods in LMICs include dietary fortification, micronutrient supplementation, biofortification, dietary diversification, nutrition education, and social protection. While these methods hold promise, they must be tailored to suit the needs of specific target populations and integrated with other sectors and stakeholders, despite the challenges they encounter [15]. Incorporation of different types of food items in diets (from multiple food groups) provides solutions to these problems as they supply the required nutrients, and sustainable food practices can increase nutrition along with enhancing food security. These types of foods usually include grains, legumes, greens, fruits, animal foods and fats, all of which provide vital nutrients needed for peak health [82]. Sustainable Food production practices focus on using natural resources efficiently and sustainably reducing the impact on the Environment & Society. These approaches can improve the quality, variety, and robustness of food systems which can in turn promote better feeding and nutritional security. Promoting environmentally friendly methods of food production will help provide people with adequate access to nutrient-dense and culturally appropriate foods that accommodate special needs and wants [11].

Appropriate and sensitive means for enhancing contextual dietary diversity in the African societies can be formulated using culturally relevant approaches such as use of food traditional practices, enhanced household costs,

and other factors on communities' preferences. In this sense, the first strategy can be to promote the intake of locally produced grains and green vegetables including millet, sorghum, amaranth and other green fortics that are resistant to harsh climates and are easily recognizable by local peoples. These traditional foods are relatively cheaper and easier to access than imported foods, therefore, can easily be adopted by the low income earning households [206].

Supporting small kitchen garden and urban farming can go a long way in improving the status of access to diverse foods since families can learn how to grow crops for improved nutrient densities at home. This also assists in the sustainability of the conventional food practices even as a vehicle for increasing food choice options. Cultural promotion is important as it can be tailored and focuses on the nutritional value of foods and the local dishes hence encouraging change from processed foods by the youthful population [28].

Other interventions should include food fortification programmes and the encouragement of increased small scale livestock production for protein nutrition like poultry, eggs and fish which will diversify the African communities' diets. To maintain affordability, governments and NGOs can provide subsidies to components such as seeds, fertilisers and farming equipment especially to the small-holder farmers. Local markets can also contribute more for the effectiveness by supplying right and varied food items round the year with improved structures and fewer wastages [183].

These forms of policies should honour cultural choice freedom and multiplication of food options within a typical community as a way of improving dietary diversity and food security in the long run.

#### **Improving food safety, food labelling, and consumer protection**

The state of the world's food systems is changing drastically, and today, there is more focus and emphasis on improving food systems to protect the environment, provide nutritious and safe meals, offer equitable incomes and livelihoods, and promote prosperity [59, 60, 77, 180, 205, 209]. In nutrient-dense foods and overall improvement in food quality issues revolving around food safety, food labelling, and consumer protection stand at the front of the line. These factors significantly affect the health and prosperity of consumers [181]. Both concepts involve preventing harm and disease derived from food-source outbreaks, while labelling means ensuring that key details, including ingredients list, food allergen list, calorie, origin, expiration date etc. Consumer protection involves the compliance of legislation to regulate fraudulent activities (adulteration, cheating), along with others,

including misleading advertising claims [15]. Improving these aspects has positives for food quality/nutrition. It results in decreased incidence of foodborne diseases, contamination and spoilage risks, and preservation of nutrients using best practices in hygiene and sanitation, proper handling, storage, and traceability. Better food labelling allows producers to improve their products and for consumers to have the ability to select based on health-related claims, eco-label, or organic certification [215].

Furthermore, enhancing consumer protection measures against deceptive or subpar food products fosters fairness and innovation within the food industry by upholding quality standards and rigorously monitoring compliance. Clear food labelling empowers consumers, improved food safety preserves nutrients and prevents illnesses, and robust consumer protection measures ensure fairness and innovation while safeguarding the right to food [214].

However, the practicality of the rules that govern the implementation and enforcement of food safety in the informal food markets is significantly challenging to achieve in several African nations [16]. There are lack of proper infrastructure like proper sanitation facilities, clean water, and even a proper refrigeration system to put in place to ensure that foods sold by different vendors are handled under strict hygienic conditions. This usually leads to contamination issues, especially when transporting perishable products such as meat products, dairy products and fruits among others [150].

Another challenge is that the legal framework is weak in these markets or at least the capacity to regulate and enforce that law is limited. Informal food markets are in those places not within the realm of the formal economy hence difficult for the government agencies to counter check. The regulatory bodies who are tasked with the responsibility of overseeing food safety may not be well resourced, staffed or funded adequately enough to undertake frequent inspections or monitor compliance in the food industries thus there are likely to be variations in stringency of enforcement across the various regions [2]. It is equally important to note that both the vendors and the consumers in the informal markets may not be well conversant with the food safety laws. The traders may still use traditional business practices and may not be aware of the modern food safety standards and thus need to be educated and trained but in settings that are small scale, widespread and informal [113].

The economic factors that are also present in the whole dealings between the vendors and the consumers also present major challenges. Vendors in informal markets have low profit margins and may barely be in a position to afford the structures or consumable products

that are instrumental in observing food hygiene. Consequently, consumers in these markets tend to consider the price over the safety of foods due to little income, and as a result, they keep on demanding on cheaper, but sometimes dangerous foods [2]. Meeting all of these challenges means finding a way to enhance the levels of infrastructure, to strengthen the capacities of the regulatory authorities, to raise awareness among the stakeholders at the same time with regard to the fact that they are working in the sphere of informal economy and have limited resources for investments and innovations.

### **Governance, accountability, and participation**

The concept of governance has undergone significant development across various academic disciplines, resulting in a diverse array of definitions and applications [110]. Termeer et al. [190] describe governance as “the interactions between public and private entities ultimately aiming at the realization of collective goals”. Distinguishing governance from government, as noted by [158] and [106], reveals that governance is characterized by less hierarchical and more decentralized approaches to addressing public issues. In recent years, the significance of governance has grown, particularly in the context of food security. Food security encompasses the elements of food availability, access, and utilization and is often defined as ensuring “all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life” [68]. These components are also required to remain stable over time [66]. These interactions span both the internal and external dimensions of food systems, encompassing a wide range of factors, including food pricing, agricultural trade, poverty reduction, infrastructure development, education, and crisis management [98]. Moreover, within the context of food security, governance extends its reach to encompass the management of the overarching environment within which these interactions occur [102]. In essence, food security governance not only pertains to fostering interactions aimed at enhancing food security but also involves overseeing the broader framework within which these interactions unfold.

Good or democratic government is indispensable on this foundation for the successful application of agricultural policies that will improve food security and the sustainable development of all. In this setting, these include elements such as stability, the rule of law, administrative competency, and a strong and effective civil society, all of which are crucial prerequisites for making policy instruments work (and achieve) food security goals. Important to note: The [68]itself has many references in its documents underlining



the centrality of “good governance” for improving food security, reducing poverty, and promoting sustainability. Such papers encourage “all countries” to strengthen governance in all relevant domains regarding the achievement of food security and “the right to adequate food”, the latter term taken directly from the World Food Summit Agenda, paragraph 25, in 1992. It’s worth mentioning though that these records fail to provide an exact meaning for the term ‘good governance’ [210]. The difficulty in defining what governance might mean (‘good’/‘democratic’) is doubled by how fleeting and nuanced governance is. In addition, meanings related to ‘enhancing governance’ can differ across various types of actors and governments [62, 65]. As we navigate these complexities, it becomes evident that achieving good governance is a critical pillar within the broader aim of enhancing global food security and advancing sustainable development.

As per [62, 65] characteristics of Good Governance include responsibility, accountability, transparency, involvement and equity. Those accountable are answerable to people who suffer, are affected by, or have granted these individuals the power to explain themselves. Responsibility means people can be held responsible for what they deliver and face consequences when failing to do so. Examples of accountability mechanisms include legal frameworks, operational procedures, oversight committees, complaint systems, social audits, and budget tracking. It is important to have accountability to ensure the effectiveness, efficiency and equity in food security policies and programmes [62, 65]. Participation is the engagement of the key players in making, delivering, watching, and evaluating policies and programmes concerned with food security. Various forms of involvement are permissible—e.g. representation, cooperation, power sharing, or consultation. Quality, legitimacy, and ownership may also be improved through involvement when decisions and actions associated with food security are taken. It also enhances the participation of marginalized groups, including women, youth, local communities, smallholder farmers and small food enterprises [62, 65].

Political and economic instability has all but ravaged the much-needed attempts to improve food security in several African countries through misappropriation of resources, skewed provision of food aid and general bureaucratic inefficiency in policy execution [213]. For example, in Nigeria, there has been a corruption in the distribution of agricultural subsidies such that fertilizers, seeds and farming equipment meant for smallholder farmers end up being sold to people in the black markets [114]. Likewise in Kenya, food aid intended for the drought affected areas has in some cases either been stolen or sold and hence failure to reach the targeted groups

thereby denying those in need the assistance that they require to fight food insecurity [54].

Another weakness is that in Zimbabwe implementation of the land reform program that was supposed to see the displacement of large scale commercial farmers and the allocation of land to small scale producers was characterised by corruption and political influence. Many of the new landholders were not equipped with the means and knowledge that are required for farming hence there was widespread famine [31]. Likewise in Malawi, the funds that would have been used in supporting agricultural development projects have been either stolen or mis-used thus resulting to poor food security programs and delayed agricultural production [204].

To promote transparency and accountability in the food system, countries should provide for the formation of decentralized supervisory agencies that would monitor the food aid, subsidies and other resources meant for the agricultural sector. These bodies should have the ability to conduct audits on any programs as well as disclose the results to the public to guarantee that the right resources are attained effectively and by the intended recipients. Furthermore, blockchain technology could help to enhance the transparency of supply chains thus providing an evidence of subsidies and aids given in the food industry [151].

Another area that requires reinforcement is improvement of legal provisions for the legal prosecution of corruption within the food sector. Authorities must formally establish anti-corruption units endowed with the remit and capacity to probe and sanction persons involved in corrupt activities within the FSPs. It is in the interest of civil society organizations, media, human rights organizations to spear head the expose and awareness campaign to put pressure on the government to increase its transparency levels.

Governance, accountability, and participation can be improved in food security as seen in Table 3 by:

1. Strengthening governance structures and accountability mechanisms: Doing so could entail establishing or re-establishing institutions responsible for coordinating, implementing, and monitoring food security policies and programs at different levels (local, nationwide, regional, or global) depending on the specific context. As an example, the United Nations Committee on World Food Security (CFS), created in 2009, represents a multi-stakeholder platform to facilitate policy coherence and accountability for food security. [43]. In 1974, the CFS came into existence due to the global crisis of food and then re-formed in 2009 to be more comprehensive, efficient, and adaptable for tackling the concerns around food insecurity

**Table 3** Ways to improve food security through governance, accountability and participation

Improvement strategy	Description
Strengthening Governance Structures and Accountability Mechanisms	Institutional structures should be established or reinstated to oversee the coordination, implementation, and monitoring of food security policies and programs across various levels, including local, nationwide, regional, and global scales
Civil Society Participation and the Role of Grassroots Organizations	Efforts should be made to develop the skills and create opportunities for civil society actors, especially those representing marginalized groups impacted by food insecurity, enabling their active involvement in food security governance processes
Promoting Transparency and Monitoring Progress	Establishing or reinforcing information systems is essential for collecting, analyzing, and disseminating data regarding food security indicators, outcomes, and effects. In addition, employing human rights-based benchmarks and standards is crucial for assessing governmental adherence to obligations in respecting, protecting, and fulfilling the right to food

and under-nourishment. The Committee on World Food Security (CFS) is made up of government officials, members of civil society, businesspeople, representatives of international agencies, academics and other interested parties who meet twice yearly to agree on policy recommendations and guidance papers on all sorts of food security and the Voluntary Guidelines to support the progressive realisation of the right to adequate food in the context of national food security (Right to Food Guidelines), two instruments crucial to the strengthening of governance and accountabilities for food security issues [63].

2. Civil society participation and the role of grassroots organizations: This can mean building the capacity and opportunities of civil society actors, particularly those representing the groups most affected by food insecurity to engage in food security governance processes. For instance, the [68]Right to Food Guidelines state that right-holders should be strengthened, and their effective participation ensured in all processes that bring about greater accountability and transparency [68]). Civil society organisations (CSOs) have a critical role to play in the advocacy for the right to food, raising awareness, resource mobilisation, service delivery, monitoring progress and holding duty bearers accountable. CSOs can also build networks and coalitions to increase their voice of influence at different levels. This includes CSO networks like the Global Network for the Right to Food and Nutrition (GNRtFN) which boasts over 60 member organizations working collaboratively to promote food and nutrition rights at country and local levels as well as at the regional and global levels [78].
3. Promoting transparency and monitoring progress in the realization of the right to food: This entails setting up or strengthening information systems for gathering, processing, and presenting data on food security

indices, results, and impact. It can also entail designing or utilizing human rights-based benchmarks and standards that measure state compliance with their duties to respect, protect and ensure the right to food. An example is the [68]. Right to Food Assessment Handbook which offers guidance on how to make an exhaustive assessment of the situation of the right to food within a given country [68]. The manual includes elements of law and institutions, policy analysis, budget analysis, stakeholder mapping, vulnerability analysis, impact evaluation and reporting. It also provides examples of indicators that can be used to assess various dimensions of the right to food, including availability, accessibility, adequacy, and stability of food. A handbook to help guide governments, civil society, academia, and others involved in facilitating participatory and evidence-based stock-taking on the right to food [68].

**International cooperation and aid**

International cooperation refers to international aid which is provided by one country or a group of countries to another country or a group of countries, mainly intended for promoting development, humanitarian aid, peace and security, human rights, or other global public goods. International cooperation and aid may come in different forms in terms of modality, including grants, loans, technical cooperation/assistance, capacity building, trade preferences, and debt forgiveness, among others, and with different stakeholders such as governments, and international organizations. Access to food as a human right (by self-production or purchase) is threatened by hunger, malnutrition, poverty, and conflict in Africa [145, 172, 173]. To secure this right to food, global actors, donors, and institutions can offer financial,

technical, and political assistance to African governments and other stakeholders to improve food security and nutrition [27]. In addition, this right should be implemented domestically via legal, and institutional reform, capacity-building, monitoring, and advocacy, for example in the form of guidelines for countries drafting new laws, policies, and strategies [63]. To tackle global challenges and achieve Sustainable Development Goals (SDGs), effective international cooperation is critical [196]. It is not without problems, though. The challenges impeding successful international collaboration are divergent interests and objectives from donor states and receiver states, absence of synchronicity between different actors and initiatives, insufficient association with national strategies and commitment from local actors, deficient monitoring and effectiveness of results and impact. While there are challenges, such as ineffective coordination between different actors and initiatives (leveraging comparative advantage and complementarity among different actors and initiatives, building mutual learning and knowledge sharing among partners, fostering participative and empowering civil society organizations in the process of decision-making and implementation [63].

Aid dependency, however, is highly problematic for the development of local food systems since it threatens the ability of local agriculture production to sustain itself in the long-term, distorts financial markets, and discourages people from relying on their own resources. When people are forced to turn to international aids to source for their foods then local farmers cannot compete with free or subsidized foods and thus there reduced production to feed the communities hence increased reliance on aids. The emphasis placed on the global supply, processing and marketing of food leads over time to the subversion of local food systems' production, distribution, and innovation capabilities, posing a challenge to nutrition security for communities that are unable to build sustainable autonomous food systems (Bjornlund et al., 2020). Before dependence on the international aid can be created, the aid must be so structured in a way that will strengthen and complement local systems through knowledge transfer, and skills development and actual improvement in infrastructure. For example, agriculture assistance schemes can support education and development of the smallholder farmers, better access to appropriate tools and equipments, development of markets and supply chains as a way contributing to boost up the productivity and profitability for the farmers [191]. There is need for aid initiatives particularly to link up with the local governments, organizations, and communities to capture the needs and contexts of any given region. Such an approach could, therefore, foster the development of the desired, culture-sensitive nutrition, health,

and development responses that strengthens instead of undermining local food systems. This should also include supporting an effective means for local agricultural development related policies, including land for agricultural purposes, affordable credit, and effective market for small farmers [192]. In addition, there should be a gradual reduction approach to the aid programme implying that as the local food systems get developed, there should be equal reduction on aid. This phased approach promotes independence and power and makes certain that local food production is capable of gradually remove outside help. In addition, the proper report on the distribution of aid should be encouraged to enhance the noble goals aimed at achieving sustainable development of the countries rather than a short-term humanitarian crisis response. When aid is provided as part of large strategies of agricultural and economic development, it is good to help without the risk of creating aid dependency in the end someday.

Promoting secure access to nutritious foods is intrinsically linked to numerous facets of development, including aid quality, effective spending, innovative technology transfer, and the sharing of knowledge. Different aspects of development can contribute to enhancing food security through the following ways:

- a. Aid effectiveness: Efficient aid means the efficient use of resources to improve food production, distribution, and access. These principles allow countries receiving food aid to be responsible for their hunger prevention measures while ensuring that donors assist in a coordinated manner while being responsible themselves. The results-based approach is oriented towards the attainment of outcomes and impacts related to food security (Benin, 2014). An example of this is the Global Agriculture and Food Security Program (GAFSP), a multilateral mechanism that helps countries lead work towards improving food security and reducing poverty in low-income countries. GAFSP adheres to aid effectiveness principles by channelling its resources in line with national priorities [23], coordinating with other donors in operational processes, monitoring and evaluating its results, and establishing shared accountability between stakeholders [23].
- b. Sustainable investments: Investments pledge to bring in crucial capital for the modernization of national farming, also potentially support a slew of national development targets. To achieve the SDGs, substantially more and better investments will need to be made in agriculture and rural development. An estimated annual investment of USD 265 billion worldwide is needed to meet the two Sustainable

Development Goals (SDGs) of eliminating poverty and hunger. Agriculture accounts for a minimum of USD 140 billion from the USD 800 billion [157]. Such investments in agriculture and food systems are creating enormous expectations concerning the future of agricultural work and improved environmental sustainability for millions employed along the value chains [157]. There will be no end to hunger or poverty by 2030 without substantially higher levels of capital flows into agriculture and food systems. Agricultural investment has up to 2.5–3.15 times a higher impact on the income of the poor than does non-agricultural investment. To deliver long-term gains that benefit everyone, we need—in addition to more investment—more investment that puts at the top of the agenda sustainable access to food at the local level, decent work, secure tenure over land, equal access to natural resources and the These types of investments can be sustained with the support of inclusive and participatory decision-making processes which are inclusive of and protective of the most vulnerable [156].

- c. Technology transfer: To raise food production, sharing agricultural technologies and knowledge is essential. Enhancing agricultural practices and increasing the supply of food can result from maintaining a favourable climate for technology transfer, particularly in poor nations [133]. For instance, the Technology Facilitation Mechanism (TFM) is a platform that aids in the transfer of technology to promote the achievement of the SDGs. The TFM seeks to improve stakeholder collaboration, encourage innovation and capacity building, distribute knowledge about current technologies, and detect technology needs and gaps [133].
- d. Knowledge sharing: Societies can be enabled to make wise decisions by spreading information on sustainable farming methods, food preservation, and nutrition. ICTs (information and communication technology) can increase access to essential food security knowledge. Cooperation between nations, such as triangular and south–south cooperation, can promote capacity building and information sharing in the context of food security [103]. One organization that encourages the sharing of knowledge for food security is the Food and Agriculture Organization [68]. On a variety of topics related to food security, the [68] offers technical support, policy recommendations, data and statistics, recommendations for best practices and lessons learned, access to online communities and networks, training, education, etc. [63].

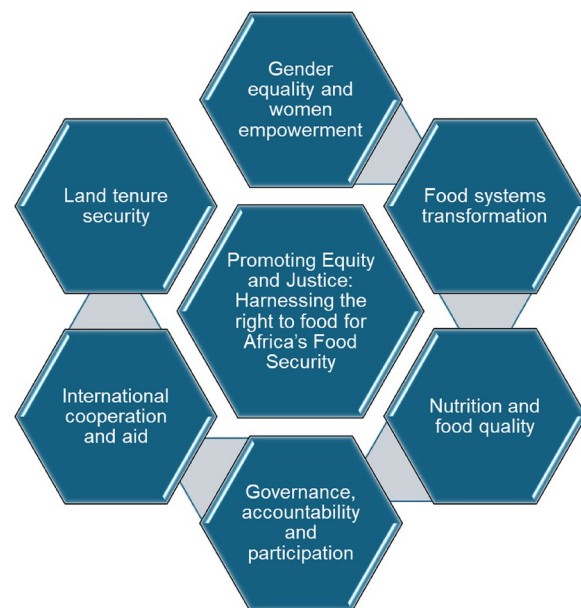
Figure 1 presents a diagram outlining various strategies to promote equity and justice in ensuring food security across Africa. The diagram serves as a visual representation of interconnected approaches aimed at addressing the complex challenges associated with food insecurity while prioritizing equity and justice.

### Food security in Africa

#### Prospects and recommendations

Emerging trends and opportunities that could help advance the right to food include the use of sustainable fisheries and aquaculture as a source of food security and nutrition, especially for coastal and island communities, the development of responsible global value chains for agricultural products that respect rights, livelihoods and resources of producers, workers and consumers, adoption of coherent food security responses that incorporate the right to food into global and regional initiatives, such as the High-Level Panel of Experts (HLPE) on food security and nutrition, and the engagement of G20 and G7 countries in supporting the provision of global public goods in the area of food security and sustainable agriculture, such as addressing climate change, migration, responsible investments, biofuels, food losses and waste, and price volatility.

Policy recommendations that could help governments, regional bodies, and stakeholders to advance the right to food are to implement the Voluntary Guidelines on the Right to Food adopted by the [68] Council in 2004, which provide practical guidance on how



**Fig. 1** Diagram showing strategies that can be used to promote equity and justice in ensuring

to realize the right to adequate food for all, to follow the OECD–[68] Guidance for Responsible Agricultural Supply Chains, which provides a framework for identifying, assessing, mitigating and reporting on risks related to human rights, labour standards, environmental protection and governance in agricultural supply chains, to endorse the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security, which provide guidance on how to improve tenure security and access to land and other natural resources for all, especially for marginalized groups, and support the work of the Committee on World Food Security (CFS), which is the foremost inclusive international and intergovernmental platform for all stakeholders to work together to ensure food security and nutrition for all.

Collaboration and partnerships that could help achieve food security and the right to food in Africa are World Banana Forum, which is a multi-stakeholder platform that brings together producers, traders, retailers, consumers, governments, research institutions, civil society organizations and others to promote sustainable banana production and trade. The Building Responsible Global Value Chains for the Sustainable Production and Trade of Tropical Fruits project aims to enhance the sustainability and inclusiveness of tropical fruit value chains in Africa, Asia and Latin America through capacity building, policy dialogue and knowledge sharing, and The African Union Agenda 2063, which is a strategic framework for the socio-economic transformation of the continent over the next 50 years, with a vision of an integrated, prosperous and peaceful Africa that upholds human rights and dignity for all.

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#### Author contributions

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