



Review article

Agripreneurship as a panacea for food security in Tanzania: A systematic review

Isaac Kazungu^{a,*}, Neema P. Kumburu^b^a Department of Business Management, Moshi Co-operative University, Kilimanjaro, Tanzania^b Department of Human Capital Management, Moshi Co-operative University, Kilimanjaro, Tanzania

ARTICLE INFO

Keywords:

Agripreneurship
Entrepreneurship
Food security
Tanzania

ABSTRACT

Agripreneurship as one of the means to ensure food security in Tanzania has received scant attention. This study bridges the knowledge gap by showing the state of the art on agripreneurship and food security in Tanzania, research themes and new developments on the two concepts, showing literature gaps and practise on the concepts, and showing how agripreneurship is a solution to food insecurity in Tanzania. Herein, a total of 61 articles retrieved from Scopus, Google Scholar, and the Web of Science databases on the themes of agripreneurship and food security were reviewed. This study has demonstrated agripreneurship techniques can be a solution to food security by ensuring food availability, accessibility, and affordability. Thus, it is recommended to the policymakers that they formulate a policy that focuses on both supply-side and demand-side factors. Furthermore, agripreneurs are urged to update their knowledge and skills so that they can access timely information through ICT tools, mostly TV, radio, and phone.

1. Introduction

Africa is rich in human capital, arable land, and water, which promote the sustainability of agriculture and improve food security [12]. Whereas research reveals that increasing food security in Africa requires more investments in agricultural infrastructure and technological supports, capacity building, and uniformity in public policies and programmes for economic growth and transformation, a critical challenge to agricultural transformation remains a low level of investments in the agricultural sector [35]. Africa is also known for having the fastest population growth rate in the world. It is projected that its population will grow from 1.1 billion (in 2015) to 2.5 billion (in 2050), respectively [42]. This will have enormous implications for food security on the continent.

Governments across the continent, in collaboration with donor communities and development partners, have launched numerous programmes that focus on transforming the agriculture sector and promoting food security. Some of these programmes include the African Union's (AU) 2014 Malabo Declaration on the growth and transformation of agriculture in Africa, the Comprehensive Africa Agriculture Development Programme (CAADP), and the Science, Technology, and Innovations Strategy for Africa 2024, which focuses on promoting research and development in agriculture. Other continental initiatives include the African Union Agenda 2063 and the Feed Africa Strategy 2025 of the African Development Bank (AfDB), which together focuses on promoting food security in Africa [39, 59].

In East Africa, investments in agriculture production and food security are reported to have continued to fall short with less of a

* Corresponding author.

E-mail address: isaackazungu@gmail.com (I. Kazungu).

national and regional commitment. According to AfDB [2], Burundi is the only country in the region that has at least managed to realise the CAADP objective of spending 10% in the agricultural sector. Tanzania, just like other East African countries, is a victim of food insecurity as it has not achieved stable agriculture production and food security. This, among others, is largely attributed to the low level of food production, which is the result of challenges such as deprived agriculture infrastructures, unreliable markets, poor access to agriculture credits, low number of agro-dealers operating in rural areas, fluctuation of food prices, adverse weather conditions, poor drainage, and inadequate irrigation [30,35,51].

As a solution to these problems, local farmers may opt for agripreneurship. They can shift from traditional subsistence farming to modern agribusiness enterprises. Agripreneurship has proven to be an effective means for food security, poverty reduction, and socio-economic transformation. Unlike traditional farming, agripreneurship is flexible and multi-functional in nature. It has great potential for absorbing an educated and unemployed population, which may lead to high productivity and thereby promote food security in Africa. This highlights the opportunity for unemployed people to enter agribusiness and, as a result, transform the rural sector and food security. This will therefore make agripreneurship an attractive and lucrative sector and thereby realise SDGs 1, 2, and 8 (i.e., zero poverty, no hunger, a decent working environment, and economic growth) [4].

Agriculture is undergoing a comprehensive shift from conventional farming to the agro-industrial sector. Currently, agripreneurship is viewed as a means to transform traditional agriculture into an enterprise [54]. Agripreneurs are a very important part of sectoral development; they play a significant role as catalysts in efforts to transform traditional farming into a modern-day agricultural sector. Agripreneurship is often construed as a solution for youth unemployment, especially in rural areas [15]. Agripreneurs are also motivating rural youth to actively participate in agri-activities rather than migrating to urban areas for other off-farm activities. It also inculcates a sense of self-reliance and economic self-sufficiency among entrepreneurs and local communities as a whole [55].

The need for agripreneurship emanates from factors such as the continued increasing demand for quality and organic food and the availability of low-cost agricultural production technologies, which serve as a competitive advantage to primary agricultural production activities (e.g., livestock, wild craft production, and rain-fed farming). Others include increased ability and willingness to enter into agribusinesses by the private sector; increased efforts to reduce child and women's malnutrition; and increased global attention to safeguarding food security [56].

The word "agripreneurs" originates from two words, "agri" and "preneur," where agri is taken from the word "agriculture" and preneur refers to a short form of the word "entrepreneurship" [8]. Thus, "agripreneur" is well-defined as an entrepreneur who is majorly engaged in agriculture or agriculture-related undertakings [5]. From this aspect, agripreneurs can be defined as individual farmers who engage in a series of farming activities as their income-generating activities [58].

Agripreneurship therefore refers to a profitable blend of agricultural and entrepreneurial activities in the agri-food and agriculture sectors that transforms a farm into an agribusiness enterprise. Agripreneurship in its holistic form consists of the traditional activities like production and supply of agricultural inputs, production, harvesting, processing, storage, and delivery of farm produce [49]. It also includes modern business undertakings like initiating and growing an agro-business, changing business strategy, mergers and acquisitions, business innovations, and risk-taking in relation to the unreliable farming environment [54]. Overall, agripreneurship focuses on promoting entrepreneurship skills among individual farmers and creating an entrepreneurial way of doing things in agriculture production [57].

Agripreneurs are motivated by pull factors, are profit-oriented, have cooperation and networking skills, are strategic thinkers, want to diversify farming, and make extensive use of available market potentials, technologies, and resources. They are also technically trained, agriculturally knowledgeable, prepared to compete, able to access high-value markets, have potential entrepreneurial opportunities, product and market innovations, good business decision-making skills, and a high proclivity to take risks. Furthermore, they are self-motivated, have strong market linkages, and have strong supply chains [9,15].

Agripreneurship undertakings have gained momentous popularity for their contribution to socio-economic gain among African economies. Agripreneurship contributes a lot to African economies in terms of higher productivity, increased food security, poverty reduction, the creation of rural employment and livelihoods, more tax revenues, higher income to farmers, improved welfare, economic growth, the facilitation of non-farm investments, especially in rural areas, the preservation of ecosystems, and the incubation of entrepreneurial talents [34,45,50,56].

Despite all these benefits, the participation of local Tanzanians in agribusiness is still in its infancy. This low participation in agribusiness is largely attributed to low food production, thereby leading to food insecurity in the country. Studies [44,50] reveal several barriers to participation in agripreneurship, and these include lack of capital, technical support, access to market and financial information, extension services, and the prevalence of environmental factors such as storms. To make the agricultural industry more appealing and attract more agripreneurs, the Tanzanian government is taking serious efforts like liberalising labour laws, introducing reduced interest rates, and implementing favourable policies and programmes like the 2008 National Agricultural Marketing Policy and programmes like "agricultural first," "politics means agriculture," "agriculture is life," and "food as a matter of life and death" [29].

Other measures by the Tanzanian Government include the establishment of the Agricultural Development Bank, the National Agricultural Input Voucher Scheme, the Agriculture Sector Development Programme, and the Fertilizer Bulk Procurement System [35, 51]. These initiatives are aimed at increasing agricultural production by creating attractive investment opportunities and thereby strengthening food security in the country. In this study, we assess the contribution of agribusiness to food security in Tanzania. We also attempt to show how the relationships between farmers' access to markets, entrepreneurial education and training, and entrepreneurial development relate to sustainable agricultural production and food security in terms of their access, availability, utilization, and stability. All these would then be the areas that need priority intervention.

2. Theoretical and empirical debates on agripreneurship and food security

The proponents of entrepreneurship, such as Jean-Baptiste and Richard Cantillon, lived between the 18th and 19th centuries, when agriculture was viewed as the main economic activity [58]. It is during this time that the term "entrepreneur" was invented by Richard Cantillon to mean a farmer who pays money for a farm with no guaranteed profit from such farming. Likely, Jean-Baptiste defined an entrepreneur as a farmer who carries risk and organises factors of production [46]. In the 20th century, the world witnessed a significant improvement in entrepreneurial theories. The theories were clustered into three main intellectual domains or traditions as a result of this development, each emanating from inventions by Richard Cantillon and directing at different aspects of entrepreneurial functions [60]. The first was the German tradition of Baumol, Schumpeter, and von Thünen. The second tradition was the famous neo-classical by Knight, Marshall, and Schultz, while the Austrian tradition by Kirzner, Menger, and von Mises was the third one. The German intellectual domain underscores that an entrepreneur is an architect of creative destruction and volatility; the neo-classical school observes that an entrepreneur is moving markets to a state of equilibrium with the use of entrepreneurial activities; and the Austrian domain accentuates the entrepreneur's ability to recognize profitable opportunities [60].

While defining the term "entrepreneurship," scholars in all these three domains have overemphasized and confined themselves to focusing on who the entrepreneur is and what he or she is doing. In view of this, Shane et al. [53] assert the need to take into consideration the variations in quality of entrepreneurial opportunities that dissimilar populations recognize. Entrepreneurship is essentially a set of behavioural characteristics of an individual person as opposed to a profession [60]. It reflects a propensity to respond to the situational clues of events, opportunities, and unstable characteristics that distinguish certain people from others [53]. This distinction generates new contributions that drive the market process and may take the form of new ventures, existing enterprise growth, or the formation of businesses within an existing business [22]. Despite this, traditional entrepreneurship research has largely ignored the agricultural sector, most likely due to the complexity of market regulation mechanisms and the nature of agricultural activities [22]. Agripreneurship operates in a multifaceted and versatile environment. There are multiple interesting concerns to analyse concerning agripreneurship. The nexus between agripreneurship and food security is increasingly becoming an area of research interest among scholars. The agricultural sector is dominated by smallholder farmers, with stiff competition and traditional ways of operations; nevertheless, agricultural activity is still providing potential entrepreneurial opportunities like innovations in new products, business processes, and marketing activities that can enhance food security [47].

Tanzania's food security is a national disaster; between November 2019 and April 2020, more than 20% of the residents of the 16 districts of Arusha, Tanga, and Manyara face acute food insecurity (16% face a catastrophe and 5% face an urgent situation). Approximately 34% of the population necessitates livelihood support [40]. Also, the extent of food insecurity is high in Dodoma, Singida, and Tabora, where between 45% and 55% of households is food insecure, and that 24–27% of these households are susceptible to food insecurity. It is also reported that Mwanza, Kagera, and Manyara regions have food insecurity ranks that are slightly low, representing 20–30% of households. By May 2022, a total of 5.3 million Tanzanians will have insufficient food for consumption, which equates to 9.4% of the nation's inhabitants [33].

Statistics further revealed that the rank of food insecurity is elevated in Tanzania: 15% of rural households are food insecure, with 15% extra in danger of food insecurity. Food expenditure is seen to be poor in all households; smallholder farmers wage labor, and low-income households have poor food spending levels. This demonstrates the intensity of the problem internationally and from Tanzania's perspective. While agribusiness is expected to increase farming production and advance food security, the degree to which agribusiness advances food security in Tanzania is not acknowledged. The government of Tanzania has introduced a range of actions to curb the crisis of food insecurity and increase farming production through the enactment of numerous country-wide regulations and tactics that are powerfully recognising the significance of agripreneurship in rising food security from an individual to the national level.

Research in agribusiness and food security is still fairly scarce. Recent studies in systematic reviews such as Dias et al. [16] and Fitz-Koch et al. [22] show that over the years and to a large extent, research in entrepreneurship has overlooked aspects of food security; albeit, there has recently been a slight increase in research on agricultural entrepreneurship. Furthermore, across Africa, research on agripreneurship is still comparatively limited compared to the rest of the world [1,16,22]. This is largely contributing to knowledge gaps and theoretical and contextual applications of the relationship between entrepreneurship and food security in Africa (George et al., 2016). It is worth noting that the development of agripreneurship is a promising avenue for promoting food security in Africa and Tanzania in particular. Likely, promotion of agripreneurship on the continent will strengthen agricultural commercialization, which will stimulate smallholder income growth and poverty alleviation [61].

Recent systematic literature reviews in agricultural entrepreneurship have bridged the last five decades, but little in terms of research studies has been done on agripreneurship in Africa and specifically in Tanzania. This is regardless of the significant contribution of the agricultural sector and entrepreneurship to employment creation, food security, manufactured exports, and GDP [21]. While agripreneurship embodies the elongation of entrepreneurship to the field of agriculture [22], the coverage of this inter-disciplinary field is lagging behind and, to a large extent, not well tapped in Africa and Tanzania. In addition, the few studies that have been done in this area have used distinct research objectives and methodologies.

Moreover, academicians are reasonably unsure if agripreneurship can augment food security. Research discloses incompatible views concerning the impact of agripreneurship on food security. Liang [36] believes there is a positive contribution, whereas Boney et al. [11] believe there is not. The disparity could be attributed to scholars' differing perspectives on the basis and parameters of food security, as well as the setting and methods. Furthermore, the studies have been conducted outside Tanzania and used a survey and mixed-methods approach. This gives an authentic query concerning the effect of agribusiness on food security. Furthermore, the above works utilise thin proxy measures of food security; thus, this study used three dimensions (i.e., food access, food availability, and food affordability) to define food security.

Food security refers to the accessibility and availability of foods that meet a community's nutritional needs. Usually, food security at the household level is contingent on income, fruitful land, and other productive resources possessed by the individual households [11,20]. The importance of agripreneurship is based on its ability to guarantee the accessibility, affordability, and availability of food in society, from an individual level to a countrywide level. It aids in the advancement of farming by providing a path to hunger reduction as farmers apply innovative farming methods; this, in turn, enables them to have a high yield, diverse source of income to cater for food availability, accessibility, and affordability throughout the year [20]. Agripreneurship generates employment opportunities for household members and encourages smallholder farmers to utilise advanced farming techniques because it is easy to mobilise the available resources. Thus, this work intends to examine the state of the art on agripreneurship and food security in Tanzania, assess contemporary studies and trends, and spot possible research niches. To address this goal, the following research questions are put forward: (i) What is the state of the art in agripreneurship and food security in Tanzania? (ii) What are the themes and trends in research on the two concepts? and (iii) are there gaps in the literature about either or both concepts?

3. Materials and methods

This paper reviewed and scrutinized secondary sources of data and information to assess small-scale agribusiness and guest farming for food security in Tanzania. In doing so, the study utilised the FAO framework for food security [19,21] (i.e., availability, access, utilization, and stability). Three electronic databases (i.e., Web of Science, Scopus, and Google Scholar) were utilised to explore data and information before the execution of content analysis of recognized literature sources. Proceeding to search the literature, an examination of studies on areas of agripreneurship and food security revealed numerous expressions such as "farm entrepreneurship," "farming business," "smallholder farmer entrepreneurship," and "farm agripreneurship." Consequently, the search in this study adopted these terminologies as keywords. Two terms, i.e., agripreneurship and food security, were incorporated into the search criteria. The database searches were completed on August 10, 2022, and the search results were limited to dates ranging from 1999 to 2022.

The following criteria were observed and used for screening the articles: those connecting agripreneurship and food security; free-of-charge, available full-text English articles; and those subscribed to by the Moshi Co-operative University. After examining for significance and removing duplicates from the two databases, a total of 61 articles were included for further analysis. The comprehensive agriculture and food security study yielded four themes: availability, accessibility, utilization, and stability. The techniques of examination were observed for the content of these themes and the degree to which they relate to food security in each of the articles considered. The four themes were also applied in the presentation of the findings. Results were then deliberated in the framework of food security dimensions [19,21]. See Fig. 1 for further details.

The systematic review (SR) was preferred over other research designs such as case study, longitudinal, cross-sectional, or quasi-experimental because it offered numerical benefits. One of the advantages of this design is that it delivers an apparent and all-inclusive overview of accessible substantiation on a given topic. Moreover, SRs are useful in identifying research gaps in the current understanding of a research topic and highlighting methodological concerns in research studies that can be utilised to improve later investigations on the same topic. SR is beneficial in identifying questions for which the available evidence provides clear answers and, thus, for which further research is not necessary. Authors can use this method to improve their knowledge of their subject of interest, generate new research ideas, and gain valuable skills in synthesising existing literature. SRs are thus an appropriate and well-established methodology in entrepreneurship research [16], when compared to traditional narrative reviews, as they adopt a transparent, scientific, and replicable process, which increases the quality of the intended review process as well as the results.

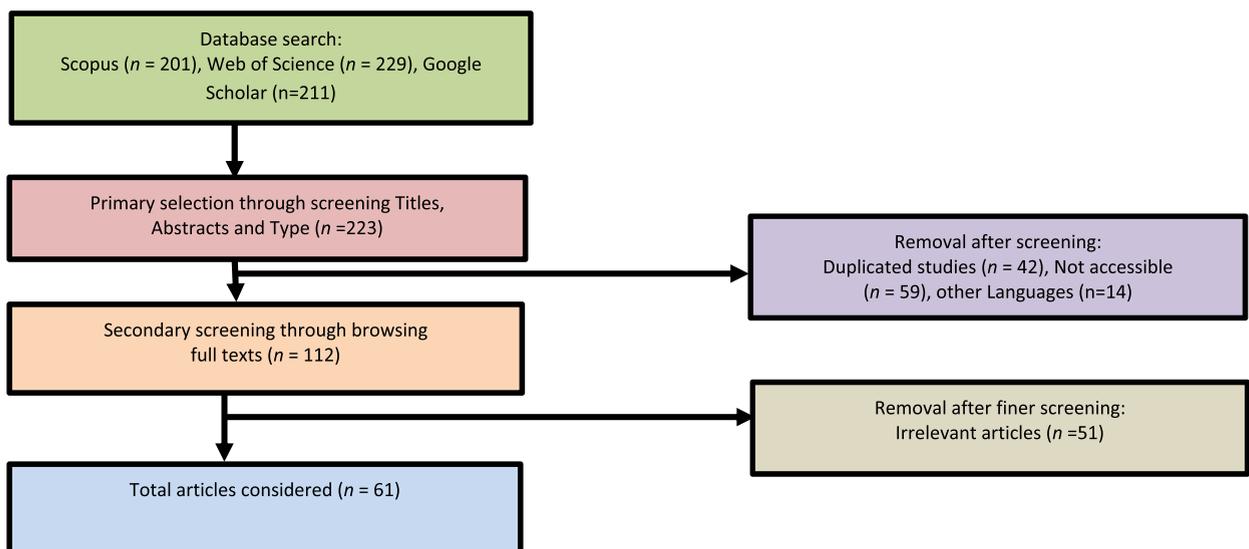


Fig. 1. Systematic review process.

4. Findings and discussions

4.1. Description of articles used

The final review used a total of 47 articles, as indicated in [Table 1](#). Out of the articles selected for the review, six (12.77%) used a qualitative research design, 34 (72.34%) a quantitative design, and seven (14.89%) a mixed design. As regards the journal articles used, all the articles used in this study were published at a rate of one article per journal.

4.2. Themes covered in the literature

Results show that the two most important themes emerged from the analysis of the texts selected: agripreneurship and food security in Tanzania. Regarding agripreneurship, three themes were identified: access to reliable market information, entrepreneurship education and training, and entrepreneurial development. All these themes were discussed and linked to the state of food security in Tanzania. Food security on the other hand has three sub-themes, which are food availability, food accessibility, and food affordability. An analysis of these items is crucial if food security is to be understood in its totality.

4.2.1. Agripreneurship in Tanzania

4.2.1.1. Access to markets. According to the review, the second-most problem that entrepreneurs face, after financing, is access to reliable market information. Farmers with reliable market information are in a good position to combat unfavourable market trends and capitalise on favourable ones. Agripreneurs in Tanzania tend to demand up-to-date information accessed through ICT tools, mostly radio and TV. They use two ICT tools to obtain information on weather forecast patterns, input prices, projected market prices, government incentives, and agricultural-related policies and programmes. Others are training on agricultural entrepreneurship, innovations, and technologies, which are essential in encouraging commercial farming that assures high productivity and food security among farming communities [10,44].

4.2.1.2. Entrepreneurship education and training. Access to entrepreneurship education increases efficiency among agripreneurs and results in higher yields, higher household income, and greater food security. Entrepreneurship education is considered an important tool in managing farming businesses. Entrepreneurship education is among the long-standing strategies that can be used to increase agriculture production and commercialization. Farmers in Tanzania should be taught commercial practices such as marketing, networking, farm accounts, distribution, and competition [41,51]. Further, entrepreneurship education needs to go further to focus on modern farming practices, the solidification of land tenure security, the formation of substantial agricultural organizations, land rights, and productivity investments among producers in local rural areas for the sake of food security in society [27,31].

4.2.1.3. Entrepreneurial development. Farming is considered a perplexing livelihood strategy. To be successful agripreneurs, farmers need to overcome a number of farm-related constraints to agriculture development [15]. In Tanzania, the most pressing constraints to entrepreneurial development that are facing local farmers include access to finance, the non-remunerative price for agricultural produce, education, weak market linkages, poor mechanisation, lack of farm inputs, storage facilities, human capital, the weak functioning of the agricultural marketing co-operatives, and overdependence on rain farming [29,35,51].

These impediments to entrepreneurial development faced by Tanzanian farmers are a barrier to the country's efficiency in food production and food security. To overcome these constraints and make farming the most profitable livelihood activity, studies [27,35, 41] advocate for the need for an entrepreneurial way of transforming farming into a commercial activity through agripreneurship as a means to empower unemployed rural communities with the ability and capability of starting farm enterprises and prospering in agriculture and its allied activities. This may take the form of capacity building on several drivers for entrepreneurship development among farmers; these may include inculcating farmers with entrepreneurial intentions such as respect for farming as a business, creativity, self-determination, passion, trust, having a wide customer base, and the desire to fulfil family responsibility. From the macro-level, there is a need for the establishment of agricultural incubation centres, e-commerce platforms for farmers, agriculture development funds for start-ups, and input supply markets [26,45,51].

Table 1
Dimensions of food security.

Pillar	Description
Food availability	The availability of an adequate amount of food of suitable quality, distributed through domestic production or imports
Food access	Access by persons or country to food, counting admission to resources to make food and the capacity to pay for food
Food utilization	Utilization of food using a suitable diet, clean water, hygiene and health care to attain a condition of nutritional well-being where all wants are attained
Food stability	To be food secure, a populace, family or person must have access to sufficient food throughout. They should not be victims of sudden shocks (e.g. an economic, communal or climatic crisis) or cyclical events (e.g. migratory food insecurity)

Source: Chanza and Musaka (2022).

4.2.2. Food security in Tanzania

According to Hlophe-Ginindza et al. [28], food security occurs when all individuals in a community have access to adequate food for a vigorous, healthy life. Thus, broadly, food security is elaborated as: (1) the presence of secure and nutritious food; and (2) a certain capability to buy and obtain food of superior quality in a communally acceptable way. On the contrary, food insecurity is evident when essential healthy food is not easily available and the poor populace is struggling to obtain sufficient food for their needs. Similarly, Chanza and Musakwa [14] adopted the FAO [19] definition, which refers to food security as being attained when "all individuals, throughout the world, have financial and physical access to enough, secure nutritious food to meet their food desires and food favourites for an active and healthy life."

Food security is classified into four main perspectives: accessibility, availability, utilization, and stability [19]. Whereas in numerous areas of the world, advances have been attained in food organisation methods that forever guarantee food accessibility and availability, Sub-Saharan Africa continues to face snags in food management due to equipment and knowledge infiltration problems [3,17]. This region trails behind the rest of the globe's efforts to deal with food insecurity; nevertheless, it happened to be food independent [32,37] (Table 1).

4.2.2.1. Food availability. Food availability refers to the extent to which food is constantly physically available in the desired amount, depending on the production, circulation, and trade arrangements of food supplies [13]. Possibly the most obviously debated component of food security is its availability. The state of food availability is well described as "the sufficiency of the distribution of good food" [6]. The existence and dominance of food retailers are fundamentals of food availability, and academicians focus on the type or superiority of food available at such merchants; for example, locations to purchase, produce, or types of nearby eating places [48]. In Tanzania, food availability has been a challenge mainly because, apart from lowering the cost of operating businesses, reducing the time incurred in transporting food items from farm to storeroom in cities or to customers in remote areas would reduce car repair costs, which increase as a result of breakdowns. Road facilities not only make food movement easier, but they also minimise the difference between farmers in rural and urban areas. As a result, consumers have two options for obtaining food: they can both stay at home and wait for farmers to sell food items, or they can go to a grocery store. The disadvantage of this method is that it consumes a lot of time, and food may not be available, or they may go out "knocking on the farmers' doors," expressing their intent to buy the food crops. This is supported by the findings of Nkwabi and Fallon [43], who noted that a large part of the population in Tanzania was found to face seasonal variations in food availability, most critically three to four months before the main harvest.

4.2.2.2. Food accessibility. Food accessibility is defined as the ability to obtain food without having to huddle due to travel time, physical characteristics of the location and store, surrounding safety, and shipping costs [3]. Food accessibility balances and builds on food availability by guaranteeing food is not only present, but that those who need it have the capital to attain that food [13]. In this arrangement, though, accessibility greatly interconnects with both availability and affordability, serving as an overpass between the two dimensions. Physical proximity to food supply areas has long been regarded as a reliable indicator of food accessibility, and a review of 107 publications on "food security" identified geographic scrutiny as the most commonly used measure in cross-sectional articles [6]. The most recurrent specification of distance, possibly, is the sum of miles to a grocery store, and it is the only one. Despite the fact that Tanzania is food-self-sufficient at the national level, food is not accessible to all. Indeed, 34% of the population is not able to meet their daily caloric requirements. Small access to food, the farming productivity gap, and susceptibility to ecological shocks are the main snags facing Tanzania's rural population. A significant proportion of rural people are malnourished (39.3%), have a low dietary energy intake (33.9%), and live in poverty (26.7%) [7]. This concurs with Fraval [23], who found that the majority (39%) of households were grouped as "harshly food insecure" (in terms of food access), and as many as 49% of households were likely to be deficient in micronutrients in the lean period.

4.2.2.3. Food affordability. Carson and Boege [13] and Fraval et al. [23] depict food affordability as the capability to acquire sufficient amounts of harmless and nourishing food given demands on household income outside of food. Together with availability and accessibility, affordability is possibly one of the most well-recognized dimensions of food security. Food affordability, like the previous two, is not unique to food or its sources, but is unrivalled and comprehended by the characteristics of individuals, families, and societies. Precisely, "food affordability" does not imply the cost of food alone but also regards non-food requirements on family income and the presence of dietary supports to help settle those prices. Studies linking food prices and food insecurity noted that food costs have been gradually mounting worldwide and have predominantly risen in recent decades. In less developed states, escalating food prices and price instability occurred in aggregate with the upsurge in food insecurity [52]. Nevertheless, there is limited research on the association between agripreneurship and food insecurity in Tanzania, largely owing to a lack of household finance data. Similar results were noted by GAIN [25], that the majority of Tanzanians cannot afford to pay for food items.

4.3. Agripreneurship and food security in Tanzania

In Tanzania, agripreneurship has been denied the opportunity to promote food security over the last half-century. This, among other things, is because of the state's anti-capitalist policies and practices, access to finance, the non-remunerative price for agricultural produce, the low level of education, weak market linkage, poor mechanisation, lack of farm inputs, storage facilities, human capital, the weak functioning of the agricultural marketing co-operatives, and overdependence on rain farming. With support from the government through various policies, programs, and projects, agriculture is undergoing a comprehensive shift from conventional

farming to the agro-industrial sector. Currently, agripreneurship is viewed as a means to transform traditional agriculture into an enterprise and thus enhance food security. Since food security in this paper is operationalized through availability, access, and affordability, Explanations on how agripreneurship could enhance food security are discussed hereunder.

Results in Section 4.2.1 show that in Tanzania food availability has been a challenge, so this paper argues that agripreneurship can be used as a tool to promote food availability in the country. Agripreneurs can begin selling food or agricultural products to both local and distant markets. However, it is important to note that having food available nearby does not mean that people will purchase and consume it. This implies that food buying decisions are complex and consumers do not necessarily shop at the closest available store, even if they lack resources or transportation. Thus, agripreneurs in Tanzania can ensure food security not only by selling farm produce to nearby and distant markets but also by understanding factors influencing consumers' willingness to pay. By doing so, they will be in a position to make food available based on consumers' preferences and thus help the country to be food secure.

Food access is another critical issue that necessitates agribusiness intervention. Findings also in sub-section 4.2.2 revealed that although Tanzania is food self-sufficient at the national level, food is not accessible to all. Indeed, 34% of the population is not able to meet their daily caloric requirements. Low access to food, high nutritional needs, agricultural productivity, and transportation are among the problems. Agripreneurs can ensure food accessibility by investing in the transportation of farm produce to markets and consumer households. This is crucial because transportation is a meaningful indicator of food access. This assent implies that "of all the influences that affect access to food, the most vital is a lack of finance, but second in rank is a lack of vehicles." Agripreneurs' transportation may sustain food access, especially for those lacking transportation; however, this does not negate the fact that roads need to be convenient.

Agripreneurship is also a solution to food affordability; the results in Section 4.2.3 show that the majority of Tanzanians cannot afford to pay the costs associated with having balanced meals three times a day. High food prices and non-food wants on household income shape whether food is "affordable" for consumers. Higher food prices correlate highly with food insecurity, especially for low-income earners. Findings from previous studies show that a \$10 increase in food prices might increase food insecurity by about 2.5%. Thus, agribusiness can enhance food affordability by increasing economies of scale and selling at a lower price. Improving production systems combined with higher yields leading to lower food prices is an alternative means to improve food security. Increasing production puts downward pressure on food prices, specifically in disjointed markets and where poor people reside. Lower prices facilitate access to food and essential nutrients for net food consumers.

5. Conclusions and way forward

Agripreneurship as one of the means to ensure food security in Tanzania has received scant attention. This is evidenced by the fact that most of the previous studies related food insecurity to capital, climate, the price of agricultural produce, a low level of education, weak market linkages, poor mechanisation, a lack of farm inputs, and storage facilities. Thus, this study concluded that while other factors remain constant, agribusiness is vital to ensuring food security. This study has demonstrated agripreneurship techniques can be the solution to food security by ensuring food availability, accessibility, and affordability. Notwithstanding the observed agribusiness challenges in ensuring food security, there is evidence that agribusiness is critical among many strategies that the government embarks upon. Thus, it is recommended to the policymakers that they formulate policies that centre on both supply-side and demand-side factors by enabling agripreneurs to locate a store in a society without one. Furthermore, policies should encourage the retailer to help susceptible consumers with household spending power, and transportation is needed as that will ensure availability, affordability, and access. The government should also enact policies and programmes that allow consumers to shop at traditional market outlets that are not only effective at getting food to consumers in need but also ensure their dignity and ability to make individualised food choices. Furthermore, agripreneurs are urged to update their knowledge and skills so that they can access timely information through ICT tools, mostly TV, radio, and phone. This will enable them to acquire information on weather forecast patterns, input prices, projected market prices, government incentives, and agricultural-related policies and programmes. Others are training on agricultural entrepreneurship, innovations, and technologies, which are essential in encouraging commercial farming, which assures high productivity and food security among farming communities.

Author contribution statement

All authors listed have significantly contributed to the development and the writing of this article.

Funding statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Data availability statement

No data was used for the research described in the article.

Declaration of interest's statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to

influence the work reported in this paper.

References

- [1] H. Adobor, Entrepreneurial failure in agribusiness: evidence from an emerging economy, *J. Small Bus. Enterprise Dev.* 27 (2) (2020) 237–258, <https://doi.org/10.1108/JSBED-04-2019-0131>.
- [2] Africa Development Bank (AfDB), Feed Africa: Strategy for Agricultural Transformation in Africa 2016–2025, AfDB, Abidjan, 2016. https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Feed_Africa-Strategy_for_Agricultural_Transformation_in_Africa_2016-2025.pdf.
- [3] D. Agyei, J. Owusu-Kwarteng, F. Akabanda, S. Akomea-Frempong, Indigenous African Fermented Dairy Products: Processing Technology, Microbiology and Health Benefits, *Critical Reviews in Food Science and Nutr.* 2020, <https://doi.org/10.1080/10408398.2018.1555133>.
- [4] R. Akrong, B.H. Kotu, Economic analysis of youth participation in agripreneurship in Benin, *Heliyon* 8 (1) (2022), e08738. <https://www.sciencedirect.com/science/article/pii/S2405844022000263>.
- [5] B. Aleke, U. Ojiako, D.W. Wainwright, ICT adoption in developing countries: perspectives from small-scale agribusinesses, *J. Enterprise Inf. Manag.* 24 (1) (2011) 68–84.
- [6] H. Allcott, R. Diamond, J.P. Dubé, J. Handbury, I. Rahkovsky, M. Schnell, Food deserts and the causes of nutritional inequality, *Q. J. Econ.* 134 (4) (2019) 1793–1844, <https://doi.org/10.1093/qje/qjz015>.
- [7] R. Alphonse, Addressing the mismatch between food and nutrition policies and needs in Tanzania, Africa Growth Initiat. (2017) [Online], <https://www.brookings.edu/wp/10/erh-Tanzania-policy-brief.pdf>.
- [8] K.H. Basir, S.F.P.D. Musa, An Islamic perspective of agripreneurs motivation, *J. Enterprising Communities People Places Glob. Econ.* 16 (3) (2022) 402–420, <https://doi.org/10.1108/JEC-08-2020-0147>.
- [9] O. Basso, A. Fayolle, V. Bouchard, Entrepreneurial orientation: the making of a concept, *Entrepreneurship Innovat.* 10 (4) (2009) 313–321, <https://doi.org/10.5367/00000009790012327>.
- [10] R. Benard, F. Dulle, H. Lamtane, Challenges associated with the use of information and communication technologies in information sharing by fish farmers in the Southern highlands of Tanzania, *J. Inf. Commun. Ethics Soc.* 18 (1) (2019) 44–61, <https://doi.org/10.1108/JICES-11-2018-0085>.
- [11] L. Boney, R. Collins, M.P. Miles, M.L. Verreyne, A note on entrepreneurship as an alternative logic to address food security in the developing world, *J. Dev. Enterpren.* 18 (3) (2013), 1350016, <https://doi.org/10.1142/S1084946713500167>.
- [12] W.J. Burke, T.S. Jayne, J.R. Black, Factors explaining the low and variable profitability of fertilizer application to maize in Zambia, *Agric. Econ.* 48 (1) (2017) 115–126, <https://doi.org/10.1111/agec.12299>.
- [13] J. Carson, S. Boege, The Intersection of Food Availability, Access, & Affordability with Food Security and Health, 2020. https://nhchildrenshealthfoundation.org/assets/2021/02/Carsey-Food-Insecurity-Literature-Review-Final_121720.pdf.
- [14] N. Chanza, W. Musakwa, Revitalizing indigenous ways of maintaining food security in a changing climate: a review of the evidence base from Africa, *Int. J. Climate Change Strat. Manag.* 14 (3) (2022) 252–271, <https://doi.org/10.1108/IJCCSM-06-2021-0065>.
- [15] K. Choudhury, K. Easwaran, Agricultural entrepreneurship in lower Brahmaputra valley, Assam, *J. Global Entrepreneurship Res.* 9 (1) (2019) 1–13, <https://doi.org/10.1186/s40497-019-0179-x>.
- [16] C.S. Dias, R.G. Rodrigues, J.J. Ferreira, Agricultural entrepreneurship: going back to the basics, *J. Rural Stud.* 70 (2019) 125–138, <https://doi.org/10.1016/j.jrurstud.2019.06.001>.
- [17] E. Ebifa-Othieno, A. Mugisha, P. Nyeko, J.D. Kabasa, Knowledge, attitudes and practices in tamarind [*Tamarindusindica*] use and conservation in Eastern Uganda, *J. Ethnobiol. Ethnomed.* 13 (1) (2017), <https://doi.org/10.1186/s13002-016-0133-8> available at:
- [19] FAO, Coming to terms with terminology: food security, nutrition security, food security and nutrition, food and nutrition security, in: Committee on World Food Security. Rome. 39th Session, 2012. FAO (2021). Small family farmers produce a third of the world's food. FAO Media Relations Office, www.fao.org/3/MD776E/MD776E.pdf, <https://www.fao.org/news/story/en/item/1395127/icode/>.
- [20] FAO, AQUASTAT Country Profile-United Republic of Tanzania, Food and Agriculture Organization of the United Nations (FAO), Rome, 2016.
- [21] FAO, World Food and Agriculture: Statistical Yearbook 2020. Rome, 2020. <http://www.fao.org/3/cb1329en/CB1329EN.pdf>.
- [22] S. Fitz-koch, M. Nordqvist, S. Carter, E. Hunter, Entrepreneurship in the agricultural sector: a literature review and future research opportunities, *Enterpren. Theor. Pract.* 42 (1) (2018) 129–166, <https://doi.org/10.1177/1042258717732958>.
- [23] S. Fraval, J. Hammond, J.R. Bogard, M. Ng'endo, J. van Etten, M. Herrero, M.T. van Wijk, Food access deficiencies in sub-Saharan Africa: prevalence and implications for agricultural interventions, *Front. Sustain. Food Syst.* 3 (2019) 104, <https://doi.org/10.3389/fsufs.2019.00104>.
- [25] Global Alliance for Improved Nutrition (GAIN) and United Nations Children's Fund (UNICEF), Affordability of Nutritious Foods for Complementary Feeding in Tanzania, GAIN, Geneva, 2021. Available: <https://www.gainhealth.org/resources/reports-and-publications/impact-covid-19-food-systems-situation-report>.
- [26] F. Han, B. Li, A new driver of farmers' entrepreneurial intention: findings from e-commerce poverty alleviation, *World Rev. Enterpren. Manag. Sustain. Dev.* 16 (1) (2020) 22–49, <https://doi.org/10.1504/WREMSD.2020.105512>.
- [27] C.M. Hart, What are business students taught about farming: do textbooks paint a negative picture? *Int. J. Manag. Educ.* 16 (2) (2018) 193–204. <https://www.sciencedirect.com/science/article/abs/pii/S1472811717302999>.
- [28] S.N. Hlophe-Ginindza, N.S. Mpanelli, The role of small-scale farmers in ensuring food security in africa, *FoodSecur.Afr* (2021), <https://doi.org/10.5772/intechopen.91694>.
- [29] I.J. Ismail, Market participation among smallholder farmers in Tanzania: determining the dimensionality and influence of psychological contracts, *J. Agribus. Dev. Emerg. Econ.* (2022), <https://doi.org/10.1108/JADEE-07-2021-0183>.
- [30] I.J. Ismail, I.A. Chagalima, Postharvest losses in maize: determinants and effects on profitability of processing agribusiness enterprises, *East African J. Social Appl. Sci.* 1 (2) (2019) 203–211.
- [31] T.S. Jayne, M. Muyanga, A. Wineman, H. Ghebru, C. Stevens, M. Stickler, D. Nyange, Are medium-scale farms driving agricultural transformation in sub-Saharan Africa? *Agric. Econ.* 50 (2019) 75–95. <https://onlinelibrary.wiley.com/doi/pdf/10.1111/agec.12535>.
- [32] R.H. Jamnadass, I.K. Dawson, S. Franzel, R.R.B. Leakey, D. Mithöfer, F.K. Akinnifesi, Z. Tchoundjeu, Improving livelihoods and nutrition in Sub-Saharan africa through the promotion of indigenous and exotic fruit production in smallholders' agroforestry systems: a review, *Int. For. Rev.* 13 (3) (2011) 338–354.
- [33] L. Kamer, Number of People Facing Food Insecurity in Tanzania 2021-2022, 2022. Available online, <https://www.statista.com/statistics/1236193/number-of-people-facing-food-insecurity-in-tanzania/>.
- [34] I. Kazungu, W. Magigi, Agribusiness Social Enterprises for Sustaining Livelihoods in Urban Settlements in Transition: Evidence from Nursery Gardens in Rapidly Urbanizing City in Tanzania, *City Development & Planning, Tanzania*, 2012.
- [35] A.M. Lazaro, N. Alexis, Determinants of credit demand by smallholder farmers in Morogoro, Tanzania, *Afr. J. Agric. Res.* 17 (8) (2021) 1068–1080, <https://doi.org/10.5897/AJAR2020.15382>.
- [36] K. Liang, Theme overview: the linkages between entrepreneurship and sustainable regional food networks, *Choice* 33 (2) (2018) 1–3. <https://www.jstor.org/stable/10.2307/26487437>.
- [37] Y. Luan, X. Cui, M. Ferrat, Historical trends of food self-sufficiency in Africa, *Food Secur.* 5 (3) (2013) 393–405, <https://doi.org/10.1007/s12571-013-0260-1>.
- [39] S. Mkomwa, A. Kassam, M. Bwalya, R.K. Shula, 1 the Malabo declaration and Agenda 2063: making climate smart agriculture real, *Conservat. Agri. Africa: Climate Smart Agri. Develop.* 1 (2022).
- [40] V. Mwingira, E. Msuya, W. Kisinza, S. Kathet, Summit, october 2021, *BMC Proc.* 16 (2) (2022) A1, <https://doi.org/10.11862/12919-022-00231-0>.
- [41] P.B. Nade, C.K. Malamsha, The influence of agri-entrepreneurship courses studied on youth farm entrepreneurial intention: evidence from Folk Development Colleges in Tanzania, *S. Afr. J. Econ. Manag. Sci.* 24 (1) (2021) 1–9, <https://doi.org/10.4102/sajems.v24i1.3788>.

- [42] J.J. Nieves, F.R. Stevens, A.E. Gaughan, C. Linard, A. Sorichetta, G. Hornby, A.J. Tatem, Examining the correlates and drivers of human population distributions across low- and middle-income countries, *J. R. Soc. Interface* 14 (2017) 401–419, <https://doi.org/10.1098/rsif.2017.0401>.
- [43] J.M. Nkwabi, J. Fallon, The factors affecting supplier relationship management in the food manufacturing small and medium enterprises (SMEs) in dares salaam Tanzania, *Am. Int. J. Business Manage. Stud.* 2 (1) (2020) 25–34, <https://doi.org/10.46545/ajibms.v2i1.120>.
- [44] D.O. Okello, S. Feleke, E. Gathungu, G. Owuor, O.I. Ayuya, Effect of ICT tools attributes in accessing technical, market and financial information among youth dairy agripreneurs in Tanzania, *Cogent Food Agri.* 6 (1) (2020), 1817287, <https://doi.org/10.1080/23311932.2020.1817287>.
- [45] K.O. Ouko, J.R.O. Ogola, C.A. Ng'on'ga, J.R. Wairimu, Youth involvement in agripreneurship as Nexus for poverty reduction and rural employment in Kenya, *Cogent Social Sci.* 8 (1) (2022), 2078527, <https://doi.org/10.1080/23311886.2022.2078527>.
- [46] A. Paradkar, J. Knight, P. Hansen, Innovation in start-ups: ideas filling the void or ideas devoid of resources and capabilities? *Technovation* 41 (2015) 1–10, <https://doi.org/10.1016/j.technovation.2015.03.004>.
- [47] E. Pindado, M. Sánchez, Researching the entrepreneurial behaviour of new and existing ventures in European agriculture, *Small Bus. Econ.* 49 (2) (2017) 421–444, <https://doi.org/10.1007/s11187-017-9837-y>.
- [48] M.N. Poulsen, T.A. Glass, J. Pollak, K. Bandeen-Roche, A.G. Hirsch, L. Bailey-Davis, B.S. Schwartz, Associations of multidimensional socioeconomic and built environment factors with body mass index trajectories among youth in geographically heterogeneous communities, *Prevent. Med. Reports* 15 (2019), 100939, <https://doi.org/10.1016/j.pmedr.2019.100939>.
- [49] G. Rajesha, H. Talang, R. Kumar, *Avenues for Entrepreneurship Development through Agri-Horti Ecosystem for Farmers and Rural Youth*, 2016.
- [50] M.M. Ramushu, Role of Agripreneurship in Creating Youth Employment in the Sekhukhune District Municipality, Limpopo Province, South Africa (Doctoral Dissertation), 2021. <http://hdl.handle.net/10386/3614>.
- [51] P. Rutsaert, J. Chamberlin, K.O.A. Oluoch, V.O. Kitoto, J. Donovan, The geography of agricultural input markets in rural Tanzania, *Food Secur.* 13 (6) (2021) 1379–1391, <https://doi.org/10.1007/s12571-021-01181-9>.
- [52] N. Schwartz, B. Ron, W. Kathi, Disability and food access and insecurity: a scoping review of the literature, *Health Place* 57 (2019) 107–121, <https://doi.org/10.1016/j.healthplace.2019.03.011>.
- [53] S. Shane, S. Venkataraman, The promise of entrepreneurship as a field of research, *Acad. Manag. Rev.* 25 (1) (2000) 217–226, https://doi.org/10.1007/978-3-540-48543-8_8.
- [54] K. Singh, M. Misra, Developing an agricultural entrepreneur inclination model for sustainable agriculture by integrating expert mining and ISM–MICMAC, *Environ. Dev. Sustain.* 23 (4) (2021) 5122–5150, <https://doi.org/10.1007/s10668-020-00806-x>.
- [55] C. Uche, L. Famulusi, The adoption of agripreneurship as a mitigating measure to unemployment in Nigeria : a topical review, *Global J. Manag. Bus.* 18 (2) (2018) 25–31. Retrieved from, https://globaljournals.org/GJMBR_Volume18/3-The-Adoption-of-Agripreneurship.pdf.
- [56] C. Uneze, Adopting agripreneurship education for Nigeria's quest for food security in vision 20: 2020, *Greener Journal of Educational Research* 3 (9) (2013) 411–415. <https://pdfs.semanticscholar.org/7e4f/eb21657c7e31c420abc01e2da53ef3bb8fee.pdf>.
- [57] S.S. Uplaonkar, S.S. Biradar, Development of agriculture in India through agripreneurs, *Int. J. Appl. Res.* 1 (9) (2015) 1063–1066. Retrieved from, www.allresearchjournal.com.
- [58] J. Vik, G. McElwee, Diversification and the entrepreneurial motivations of farmers in Norway, *J. Small Bus. Manag.* 49 (3) (2011) 390–410, <https://doi.org/10.1111/j.1540-627X.2011.00327.x>.
- [59] E. Warinda, D.M. Nyariki, S. Wambua, R.M. Muasya, M.A. Hanjra, Sustainable development in East Africa: impact evaluation of regional agricultural development projects in Burundi, Kenya, Rwanda, Tanzania, and Uganda, *Nat. Resour. Forum* 44 (1) (2020) 3–39, <https://doi.org/10.1111/1477-8947.12191>. Oxford, UK: Blackwell Publishing Ltd.
- [60] S. Wennekers, R. Thurik, Linking entrepreneurship and economic growth, *Small Bus. Econ.* 13 (1999) 27–55, <https://doi.org/10.1023/A>.
- [61] S. Zhou, I.J. Minde, B. Mtigwe, Smallholder agricultural commercialization for income growth and poverty alleviation in southern Africa: a review, *Afr. J. Agric. Res.* 8 (22) (2013) 2599–2608, <https://doi.org/10.5897/AJAR11.1040>.