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Research Paper

Exploring the Viability of Utilizing Agricultural and Rural Areas for Tourism: A Comparative Analysis of Farming Between Conventional and Agritourism Farms during the COVID-19 pandemic

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Abstract: This study compares the performance of conventional and agritourism farming to investigate how the COVID-19 epidemic has affected agricultural efficiency. The study was carried out in Sub-Saharan Africa, particularly in Tanzania, due to a comparatively high concentration of agritourism and conventional farmers. Regression analysis and the slack-based measure data envelopment analysis model (SBM-DEA) are used in this study to assess farming efficiency and identify the critical variables influencing the productivity of conventional and agritourism farmers. The application of the comparative approach is what sets this paper apart, as most researchers tend to examine conventional farmers and agritourism farmers separately leading to a noticeable methodological gap. The results reveal a significant efficiency gap, where conventional farmers outperformed agritourism farmers. This result shows how vulnerable agritourism farming is to external disruptions exemplified by COVID-19-related disruptions. Moreover, the study identifies the positive influence of training and direct sales-to-consumers on efficiency, while recognizing the negative influence of lack of value addition and production of export crops. These insights are important for designing targeted strategies to ensure a sustainable recovery post-COVID-19.

Keywords:

1. Agritourism
2. Efficiency
3. SBM-DEA Model
4. Comparative Analysis
5. COVID-19

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1. Introduction

Agriculture and tourism are two critical sectors for socioeconomic development in Sub-Saharan countries like Tanzania as they generate a huge portion of employment opportunities, income, and foreign exchange earnings. In Tanzania, around 65% of the workforce is employed in the agriculture sector, which contributes 25% of the GDP (NBS, 2020). Similarly, Tanzania is a popular tourist destination, well-known for its wildlife, islands, and cultural attractions. The

tourism sector creates employment in various areas, such as hotels, tour companies, restaurants, and related businesses. In 2019, the sector contributed around 17.5% to the nation's GDP and employed 11.1% of the workforce (UNWTO, 2020). Various studies suggest that the tourism industry holds the potential to reduce poverty and foster economic development in developing countries (Binns and Nel, 2002; Li et al., 2018; Liu and Wu, 2019; UNCTAD, 2004). In Tanzania, the tourism sector is used to reduce poverty through job creation and the market for traditional products (Odhiambo, 2011).

Now let's turn our focus to tourism-oriented diversification in agriculture. By combining the two sectors, agritourism has emerged as a unique form of diversification that has a positive impact on both ends. It helps farmers preserve and safeguard their rural environment while providing tourists with the chance to experience and enjoy a rural lifestyle (Sonnino, 2004). Agritourism also offers farmers a chance to improve their standard of living, opens up a new revenue stream, and creates a unique combination of tourism and agriculture-related activities. Agritourism can also offer a different market and an alternative distribution channel for farm products (Valdivia & Barbieri, 2014).

Tourism-oriented diversification has been recognized as an effective way to accelerate socioeconomic development in rural areas (Ohe & Kurihara, 2013). Additionally, it offers financial incentives to the local government and community to protect tourism resources, preserve traditional farming practices, and support a sustainable economy.

This type of diversification has resulted in the coexistence of two separate subsectors in Tanzania: agritourism and traditional farming. This study will broadly describe conventional farmers as those who just engage in traditional farming practices, without offering tourism-related experiences to visitors. And agritourism farmers will be broadly defined as individuals who own and operate farms or agricultural businesses actively providing touristic experiences. The agritourism sub-sector remains in its early stages of development and involves activities such as farm tours, agroforestry, and culinary services. In times of economic distress, such as a poor harvest or low prices, diversification strategies have been suggested to increase and stabilize farmers' incomes or to best supplement farm incomes (Kim et al., 2019). However, just as conventional farming is susceptible to external shocks like market fluctuations and climate change (Shemdoe, 2011), agritourism farming is also not immune to such shocks.

Both the conventional and agritourism subsectors experienced unparalleled disruption following the onset of the COVID-19 epidemic. As COVID-19 rapidly spread, many nations implemented strict measures to safeguard public health (Weible et al., 2020). These responses profoundly shocked the global economy (Ceylan, 2020), particularly affecting developing nations. As a result, the outbreak added huge damage to the already-vulnerable agritourism and the conventional farming subsector. While tourism-oriented diversification in the agricultural sector has been more popular recently in Sub-Saharan Africa (SSA), little research has been done on its economic resilience and effectiveness in times of crisis. The goal of the present research is to evaluate how the pandemic has differentially affected agritourism and traditional farming, with an emphasis on comparing farming productivity. The paper will also explore factors influencing the efficiency of the two groups of farmers during disruptions. Finally, the paper will recommend some insights on sustainable recovery for farmers and agricultural systems from periods of disruptions. Two questions are proposed:

- RQ1: Is there a significant efficiency gap between agritourism and conventional farmers during the pandemic?
- RQ2: What are the key factors that affect efficiency of both conventional and agritourism farmers?

The capacity of a farm to produce the highest level of output with the lowest amount of feasible inputs will be the definition of farming efficiency used in this paper (Chimai, 2011). Therefore, given the quantity of input utilized, efficient farms are those that are able to generate the maximum amount of revenue. In other words, an efficient farm uses its resources effectively to get the most value and to produce revenue while minimizing waste; conversely, inefficient farms are those that fail to utilize their inputs effectively to produce the same level of output compared to the most efficient farms in the sample (Odhiambo et al., 2004). Inefficient farms may needlessly require a higher level of inputs than necessary to produce the outputs they generate, indicating that they have not adapted well to the pandemic disruptions.

The results of this study can provide valuable insights for stakeholders aiming for a sustainable post-pandemic recovery for farmers and agricultural systems across Sub-Saharan Africa (Duguma et al., 2021; Gordon, 2020). Similarly, conflicts of interest between players in the agritourism subsector are an inevitable occurrence (Wang & Yotsumoto, 2019). Thus, the research findings may help policymakers in arriving at well-informed choices that yield mutual benefits among all stakeholders, particularly as they strive to recover from the COVID-19 pandemic. Finally, knowing what influences efficiency will equip farmers with some insights to withstand future economic disruptions.

The sections of this paper are organized as follows. Section 2 reviews Tanzania's agriculture and tourism sectors, the emergence of tourism-oriented diversification, the impact of COVID-19, and the implementation of data envelopment analysis. Section 3 covers the study's methodology and background. Section 4 presents and discusses the results. Section 5 lays out the conclusion, recommendations, and further research. Section 6 elucidates the study's limitations.

2. Literature review

2.1. An overview of Tanzania's agriculture and tourism sectors

Tanzania is a country with abundant resources for both agriculture and tourism. Agriculture in Tanzania is dominated by conventional farmers involved in cultivation of staple crops, livestock keeping, and subsistence farming (Kimaro & Hieronimo, 2014; Tanzania invests, 2020). Tanzania is also one of the most popular tourist destinations in sub-Saharan Africa. According to the World Tourism Organization, 2021, In 2019, Tanzania held a significant share of international tourism receipts in the region, ranking behind South Africa as the leader in terms of international tourism receipts. Tanzania's economy is heavily dependent on the agricultural sector (Mwonge & Naho, 2021); But, the sector faces challenges like low productivity, price fluctuations, and limited market access, preventing it from realizing its full potential (World Bank, 2018). Moreover, Shemdoe (2011) mentioned climate variability, such as irregular rain patterns, periodic droughts, and flooding, as huge challenges in the agriculture sector. Similarly, the tourism sector faces its own set of challenges, including the seasonality of its operations, competition from other destinations, and a lack of diversification (OECD, 2014). Other studies argued that the leakage of tourism revenue is one of the biggest challenges (Boz, 2011; UNEPTIE, 2007). Tourism leakage occurs when revenue fails to remain or circulate within the host destination's economy because it's spent on imported goods and services, accommodations in foreign-owned hotels, and external payments such as travel agent commissions, tour operator profits, and revenue from foreign airlines (Boz, 2011; UNEPTIE, 2007). The challenges above emphasize the necessity for tourism-oriented diversification as a strategy to mitigate the issues in Sub-Saharan Africa, as discussed in the next section.

2.2. The emergence of tourism-oriented diversification

Agritourism has been more popular in recent years as a way for the agricultural sector to diversify. It gives farmers an opportunity to make extra revenue and broaden their horizons by engaging in activities beyond conventional farming practices (Lyon & Canovi, 2019). Along with helping farmers preserve agricultural viability and diversify rural economies, it offers visitors a unique chance to enjoy traditional rural hospitality, access to nature, and cultural experiences (Yang, 2012). Additionally, by guaranteeing that even marginalized rural populations actively participate in and profit from tourism, agritourism might play a vital role in establishing more inclusive and sustainable socio-economic growth in rural areas. A tourism-related poverty reduction plan has to include policies that promote quick and sustainable economic growth (Karunarathne et al., 2019). In principle, the exclusion of the local community hinders sustainability. Lastly, due to high competition in the tourism sector, countries are increasingly aiming to leverage and promote their natural resources as a strategic approach to attract more tourists (Plourde, 2003). This is achieved by strategically expanding and diversifying the range of attractions and services within a destination to appeal to a broader spectrum of tourists; these new tourism products, experiences, and services cater to different demographics of tourists. Consequently, if Sub-Saharan African countries like Tanzania fail to capitalize on this opportunity, they might find themselves in a disadvantaged position.

2.3. Economic susceptibility in the agriculture sector and the impact of covid-19

Tanzania's government imposed localized lockdowns around the country in response to the surge in COVID-19 cases that began in 2020 (Economic Commission for Africa, 2020). Restrictions on movement delayed time-sensitive tasks, which had an effect on the amount and quality of agricultural output. Disruptions in labor mobility, supply chains, and the availability of crucial farming inputs were the causes of the impacts (Ayanlade & Radeny, 2020; Wang et al., 2022). Due to the unforeseen labor supply disruption caused by the COVID-19 pandemic, it was difficult to fill production roles, which increased costs and decreased productivity (Wang et al., 2022). This added to the vulnerability associated with external shocks, such as climate change and market fluctuations. Similarly, amid its successful establishment, the trajectory of tourism-oriented diversification encountered an unforeseen disruption by COVID-19, inflicting a profound and devastating impact. The substantial negative consequences of movement restrictions on non-essential sectors, particularly the service and tourist industries, were brought to light by Arita et al. (2022).

2.4. Unexplored areas and gaps in the existing literature

Considering that agricultural systems and crop production in Sub-Saharan Africa are diverse and heterogeneous by nature (de Graaff et al., 2011), the impact of the COVID-19 disruption is unlikely to be uniform across the board (Ayanlade and Radeny, 2020). Different farmers undoubtedly have different capacities to react, adjust, and absorb the shocks from the disruption depending on aspects including crop types, agritourism engagement, age of farmers, value addition strategies, reliance on foreign markets, and training. Béné (2020) revealed that the ability of farmers to address the challenges posed by COVID-19 is deeply influenced by context, including factors like country-specific restrictions, socio-economic conditions, and integration within supply chains.

Despite the importance of tourism-oriented diversification in the agricultural sector, the empirical evidence of the impacts of COVID-19 on agricultural systems across Sub-Saharan Africa is notably limited. Previous research has consistently pointed to the need for a thorough investigation and comprehension of the effects of the COVID-19 disruption on different farmer

groups (Cattivelli & Rusciano 2020; Darnhofer 2020; Gunther 2020; Henry 2020). Furthermore, existing literature has predominantly focused on conventional farming, ignoring the emerging sub-sector of agritourism; therefore, there is a contextual gap resulting from the prior studies' failure to consider the agritourism subsector. Lastly, as far as the authors know, there is a noticeable methodological gap involving the oversight of comparative analysis between the two categories of farmers in Sub-Sahara Africa, as most researchers tend to examine conventional farmers and agritourism farmers separately. The application of the comparative approach is what sets this paper apart. This study aims to bring a fresh perspective and lay the foundation for future researchers to examine variations in the impacts experienced by different sub-groups within a broader collective during disruptions. The use of data envelope analysis (DEA), which is not yet widely applied in the domains of agriculture and agritourism, would be another noteworthy contribution.

2.5. Data envelopment analysis (DEA) and DEA extensions

Data envelopment analysis (DEA) is a non-parametric approach used for the estimation of the efficiency of the decision-making units of companies, businesses, or farms (Cooper et al., 2007). It is employed to provide insights about how best to allocate resources to increase efficiency. For its implementation, the DEA approach only requires data on quantities produced and inputs used (Coelli et al., 2005). DEA analysis is appropriate for assessing farm efficiency in the context of this study as it does not need assumptions about farm production technology, can be used at any aggregate level, including the farm level, and allows multiple outputs and inputs (Perrigot et al., 2009). Two basic DEA models are the CCR (Charnes-Cooper-Rhodes), which assumes a constant return to scale, and the BCC (Banker-Charnes-Cooper), which assumes a variable return to scale (Cooper et al., 2007). Due to its radial design, which emphasizes reducing inputs and increasing outputs, these models, although being frequently used, have several drawbacks. As a result, non-radial models such as SBM models were developed. The Slack-Based Measure (SBM) of Efficiency (Tone, 2001) aims at maximizing the sum of the inputs and outputs slacks for each decision making unit (DMU) used in a sample. This model has an advantage since it considers unutilized resources in the evaluation of efficiency (Ohe, 2022).

Now let's turn our attention to DEA extensions. After getting the results of the DEA analysis, most researchers implement additional steps using the efficiency scores obtained for further analysis. The most used method is regression analysis, particularly the tobit regression model. The use of the Ordinary Least Square (OLS) model can give biased results because of the possibility of including zero values obtained in DEA analysis (Chang et al., 2022). To avoid biased results, the tobit model is preferred for exploring the socio-economic variables that are affecting the obtained efficiency scores (Gabdo et al.2018; Hassen et al. 2017).

3. Methods

A cross-sectional survey was carried out between September and November of 2022. The Arusha and Mwanza regions in Tanzania were selected due to the high concentration of agriculture and tourism activities. A single-stage sampling procedure was used for the selection of the respondents for interviews and the completion of the questionnaires. The primary respondents were farmers, but government officials were also included for additional information. Farmers were divided into two groups, namely 25 conventional farmers and 20 agritourism farmers. A random sampling technique was adapted to reduce bias and improve the generalizability of our findings (Keppel and Wickens, 2003). Ensuring that each member of the defined groups had an equal probability of being selected required the use of this technique.

Data on inputs utilized and outputs generated was gathered from both farmer groups. Revenue was the output variable, while the input factors were land size, labor cost, other material cost, and capital cost. This comprehensive approach ensured that the survey instrument included all relevant components of farming operations, hence strengthened the dataset.

The study employed a two-stage method for data analysis, whereby the input used and output generated by each farm are used as data in the first stage to estimate efficiency using a DEA model. And in the second stage, the efficiency scores of the DEA analysis were used as a dependent variable in a regression model. Since this paper touches on the topic of agritourism, which is a form of farm diversification, the Slack-Based Measure (SBM) was adopted. The SBM model is more adequate for farm diversification activities because excess inputs or shortfalls in outputs can be expected (Ohe, 2022). Furthermore, a bilateral model was used since two sets of inputs and outputs are being considered simultaneously in this study to assess the effectiveness of DMUs. The model assumed a constant return to scale (CRS) because the farms included in the sample had narrow variation and all decision-making units (DMUs) were at optimal scale (Javed et al., 2010). Additionally, the output-oriented super SBM model was used for cross-validation of the results of the SBM model, as it allows for a more robust assessment of the model's performance. In the output-oriented DEA model, the inputs are held fixed while aiming to maximize the outputs produced by the DMUs (Charnes et al., 1978; Farrel, 1957).

Because the analysis of efficiency scores is not enough to explain the factors that cause variation in efficiency, the study used the efficiency scores as dependent variables in a regression analysis for the determination of the factors influencing efficiency (Bojnec & Latruffe, 2008; Coelli et al., 2005). Since the DEA efficiency scores are bounded between 0 to 1, they are not normally distributed (Dhungana et al., 2004). For this reason, normal regression analysis is not suitable as the variables are partly continuous and partly discrete (Wooldridge, 2010). Hence, the tobit regression model was preferred (Cooper, 1999). In previous studies by Al-Mezeini et al. (2020), Dhungana et al. (2004), and Li et al. (2018), tobit analysis was applied after efficiency evaluation to detect the factors that affect the efficiencies. In our study, the variables that were anticipated to influence efficiency included age of farmers, level of education, number of crops produced, years of training, production of export crops, direct sales to consumers strategy, and value-added practices.

4. Results and Discussion

4.1. Comparative efficiency of farmers

Using data envelope analysis (DEA), farms were assessed to determine whether they were efficient or inefficient. This categorization is based on the ability of the farm to convert inputs into outputs relative to other farms included in the sample. Table 1 summarizes the variables that were used to estimate the model.

Table 1. Descriptive statistics of the Input and output variable used for DEA model

	Inputs				Output
Item	Land size (ha)	Material Cost (USD)	Labor Costs (USD)	Capital Cost (USD)	Revenue (USD)
Max	10	2200	5500	10000	12000
Min	0.5	100	200	400	500
Mean	4.6	963.3	2259.4	4153.3	5082.2
SD	2.8	660.6	1758.3	3059.8	3469.6

Note: DEA: data envelopment analysis; Source: Field survey, 2022.

The results of the bilateral SBM model show a significant efficiency gap, where conventional farmers outperform agritourism farmers. The same results were obtained by the output-oriented Super SBM model, thereby indicating a better fit of the data. The graphical representation of the relative efficiency is shown in Figure 1. Conventional farmers may have achieved greater efficiency scores because they primarily focused on producing food crops and did not rely much on the global market. According to Torero (2020) and Frelat et al. (2016), conventional farmers in Sub-Saharan Africa are largely responsible for growing a significant amount of food crops. During the COVID-19 pandemic, trade in food products experienced comparatively less disruption. This resilience in demand for food products is rooted in their essential nature for survival (Chenarides et al., 2021). Actually, as people stocked up and cooked more at home, there was an increase in demand for staple food crops like rice and maize. This increased demand pushed prices higher, increased conventional farmers' revenues, and made it easier for them to improve their efficiency compared to their counterparts. Conversely, agritourism farmers rely on revenue from both hospitality and agricultural production; And the hospitality part of the agritourism operation were heavily affected by COVID-19 restrictions leading to less efficiency. Moreover, implemented measures for maintaining health and safety protocols to keep staffs and visitors safe added to the cost of operation (Wang et al., 2022). Wang et al. (2022) compared tourism and non-tourism sector by examining the effects on output, basic price, and investment; The study found that there was a decrease in the prices of tourism goods while the prices of non-tourism goods increased owing to a demand shock. Additionally, the study found that the reduction in output in the tourism-related sector was substantially higher than that in non-tourism sectors like agriculture sector.

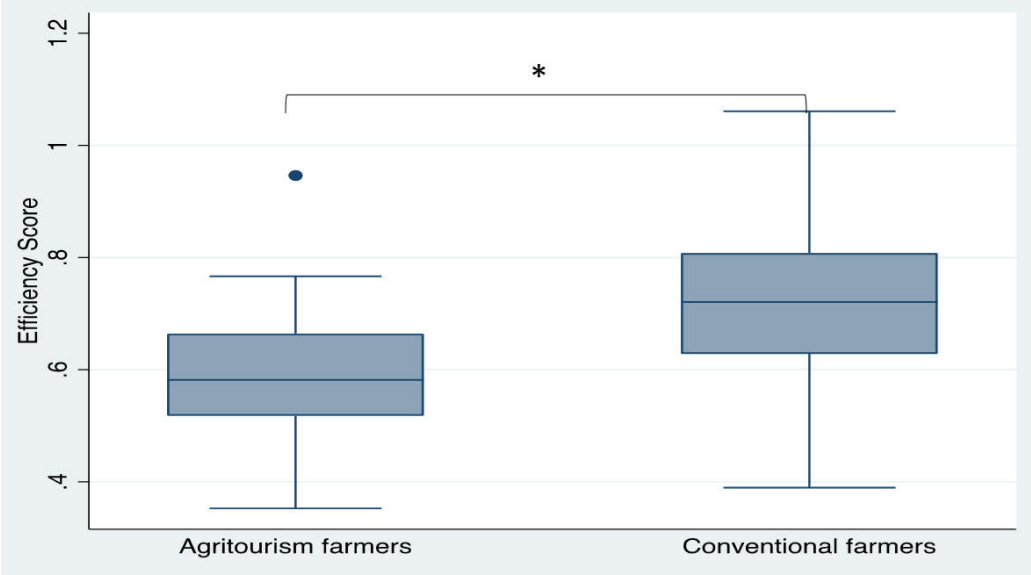

Figure 1. Boxplot of efficiency score by groups (Bilateral SBM-C)
Note: DEA: data envelopment analysis; SBM: Slack-based measure; (*) indicates 5% significance; Source: Field survey, 2022.

Additionally, due to low demand during the pandemic, harvest festivals and seasonal crop tours had to be canceled, which significantly decreased revenues. This resulted from either travel bans enforced by the government or travelers choosing to forego travel out of fear of catching the virus (Wang et al., 2022). The fact that agritourism farmers' activities did not fall

under a category of important businesses made matters worse by limiting their access to government support. This might account for the comparatively lower efficiency shown, especially among those who were still in the pioneer stage.

The boxplots indicate that conventional farmers have a higher median efficiency score but a wider interquartile range (IQR) than conventional farmers, suggesting that conventional farmers are generally more efficient but have more variability in performance than agritourism farmers. The reason behind the disparity in efficiency for conventional farmers could be attributed to several factors: Firstly, some conventional farmers are involved in the cultivation of food crops that are not typical for domestic consumption. Products not directly tied to food consumption at home often show higher sensitivity to economic disruptions (Binkley & Liu, 2019). Other conventional farmers were impacted because they produced relatively expensive crops. This is because people became reluctant to purchase some expensive crop because of decreased income and financial uncertainty. Wang et al. (2022), showed that people focused on increasing savings and reducing consumption.

Further, variability in the efficiency score may also result from some conventional farmers' use of hired labor, particularly those with farms that are relatively larger than those of their peers. Harvesting, weeding, and planting were among the crucial farm management tasks that were delayed due to a manpower shortage. Meuwissen et al. (2020) found that smaller farms which rely mostly on family labor exhibited higher resilience than bigger farms that use hired labor. Lastly, some conventional farmers produced high-value perishable crops; as a result, supply chain disruption caused more severe post-harvest losses. When Varshney & Meenakshi (2023) analyzed the effects of COVID-19 on perishable and non-perishable goods, they found that the effects varied according on the type of goods. Food products were the most negatively impacted by trade restrictions because they were especially vulnerable to disruptions in transportation (WTO, 2020).

4.2. Factors influencing efficiency

This section presents a comprehensive analysis of several factors, including age, the number of crops, involvement in export crops, years of training abroad, direct sales to consumers, and involvement in value-addition. The independent variables that affect farmers' efficiency are shown in Table 2. The output indicates that the tobit regression model is significant at the 0.000 level. The LR chi2 value of 96.29 is significant at the 5% level (prob > chi2 = 0.0000), and a higher log-likelihood of 65.744 indicates that the model is a good fit for the data.

Table 2. The results of tobit regression

Score	Coefficient	t Static
Age (years)	-0.0051***	-3.74
Number of crops produced	7.088e-06	0.00
Years of training abroad	0.0393**	2.59
Export crops (export crop =1, food crops =0)	-0.0401*	-2.24
Direct sales to consumers (direct sales to consumer =1, Other	0.0761*	2.25
Value-added products (without = 1, with = 0)	-0.0454*	-2.30
Constant	0.8134***	9.99
LR Chi-Squire	96.29*	

Note: 1) ***, **, and * indicates 0.1% significance, 1% significance and 5% significance, respectively; Source: Field survey, 2022.

4.2.1. Age of the farmers

At a statistically significant level of 0.1%, the coefficient for the age of farmers in years showed a negative value, suggesting that an increasing in age is linked to a decrease in efficiency score. This may be related to the degree of adaptation and flexibility exhibited by farmers across various age groups. During Covid-19 pandemic, a quick adjustment was required due to supply chain disruption, changing market needs, and changed customer behavior. Hence, it became obvious that flexibility and adaptability were important. Unfortunately, older farmers were less flexible to the adjustments, which could have lowered their efficiency. Although useful, elder farmers' experience may have created a degree of rigidity that made it more difficult for them to face the challenges brought on by the COVID-19 pandemic. This observation aligns with Weeden (2008) and Fried & Tauer (2016), who observed a comparable negative correlation between farmers' age and efficiency. It's necessary to understand that age's impact extends beyond production to affect marketing efforts. To illustrate, Kamdem (2012), examining the relationship between farmers' age and marketing efficiency, found a negative effect. Contrastingly, Ohe (2020) observed that the age of the farmers had a positive relationship to business performance because the elder farmers could take good care of the visitors in tourism-oriented diversification. Other studies, indicated a different observation, where efficiency slightly increases with age before eventually decreasing (Lordkipanidze & Tauer, 2000; Tauer,1995).

4.2.2. Production of export crops and food crops

The coefficient associated with the production of export crops was negative, indicating a significant decrease in the efficiency score when engaged in the production of export crops at the 5% significance level. This suggests that farmers involved in the production of export crops attained lower scores compared to those cultivating food crops. Considering the restrictions imposed, it is not surprising that there was a decline in the export trade. These results can be attributed to the more complex management requirements for export-oriented agricultural businesses during a time of economic disruption. Most countries were in survival mode, and the focus was only on the food crops, making it difficult to export crops such as cotton, coffee, and flowers. A study by Barichello, (2020) indicated that, among other things, the imposition of import restrictions in different countries threatened the agricultural trade. The outbreak of COVID-19 impacted agricultural exports negatively due to the shutdown of processing facilities and the increased number of cases among workers (Mallory, 2021). Furthermore, Mao & Chen (2021) demonstrated how trade barriers and import bans made agricultural exports more vulnerable. Specific to the context of Tanzania, Saleh (2020), demonstrated that farmers who invested in export crops suffered significant consequences, especially because Tanzania exports a significant amount of its crops to neighboring East African countries. Severe lockdowns and travel restrictions were imposed by Kenya and Uganda, resulting in border closures and restrictions on cross-border movement (Tripathi et al., 2021). As a result, there were significantly fewer delivery trucks crossing Tanzania's borders with Kenya and Uganda (für Afrika, 2020).

On the other hand, less disruption was experienced by farmers who produced food crops for the domestic market. This could be because they are less reliant on international markets; thus, disruptions in the global market had a negligible impact on them (Arita et al., 2022; Tripathi et al., 2021). This can also be attributed to the low-income elasticity of food demand due to its essential nature and shipping channels that require minimal human interaction (WTO, 2020).

4.2.3. The absence of value addition in agricultural products by farmers

Value addition means improving the original state of agricultural products to create new commodities that hold increased value and desirability in the market, thereby aiming for higher returns (Evans, 2012). In this study, involvement in value addition was given a binary variable (Lack of Value Addition = 1, Presence of Value Addition = 0). The coefficient associated with the absence of value addition was negative at a significance level of 5%. This indicates that the lack of value addition in agricultural products leads to a decrease in the efficiency score. The absence of value addition could imply a reliance on raw or unprocessed agricultural products, which are often more vulnerable to logistical challenges and market disruption. Unprocessed food products require specific conditions and infrastructure for storage and transport, which have been compromised due to COVID-19 disruption. Value addition could act as a buffer against supply chain disruptions because value-added products have a longer shelf life and are better suited to withstand fluctuations in demand and supply. By extending the shelf-life of commodities (Davis, 2006), farmers could manage to minimize post-harvest losses, thereby contributing to stability during disruption. Also, value addition contributes to increased productivity and income for farmers (Kibuthu et al., 2021).

4.2.4. Capacity building through training

The coefficient associated with years of training abroad had a positive value, meaning an increase in the efficiency score at a 1% significance level. The existence of a positive coefficient sheds light on how exposure to different practices and technology improves the efficiency of farmers. The COVID-19 disruptions called for flexible practices that could withstand unforeseen disruptions. Hence, the years of training and learning from the challenges facing other countries became very important. Farmers who received training built the capacity that could aid them in adapting quickly in order to withstand the shocks and navigate the complexity of the pandemic disruption. Our findings are in line with the work of Wright et al. (2018), who emphasize that farmers' engagement in training to enhance skills and knowledge significantly contributes to the improvement of their overall efficiency. Moreover, training for capacity building equips farmers with the necessary technology and skills required to create innovative products (Davis, 2006). Further reinforcement is found in Anang & Awuni (2018) and Mariyono (2019), who demonstrated that training programs tailored for farmers can notably improve their productivity. Similarly, Xayavong et al. (2016) unveiled the pivotal role of training in increasing farm efficiency, particularly in adopting critical cropping innovations.

4.2.5. Direct Sales-To-Consumers

In the context of this study, direct sales-to-consumer marketing includes the direct sale of farm products or services to the end consumer, local grocery stores, or restaurants (Curtis et al., 2018). This approach is popular among farmers in Tanzania, where the supply and home delivery of food crops like vegetables and fruits are very common. This study aimed to explore whether the adoption of direct sales gave an advantage to farmers during the COVID-19 disruption. Direct sales-to-consumer marketing has a positive coefficient at a 5% significance level, meaning that using this marketing approach raises the probability of having higher efficiency score. The positive relationship between efficiency score and direct sales to consumers, sheds light on the advantage of this marketing practice in adapting to the challenges posed by the pandemic disruption. This could be because direct sales strategies facilitate improved engagement and interaction with consumers to ensure a more secure market and allow for rapid adjustments to

meet changing consumer demands during the COVID-19 pandemic. Kapała et al. (2015) noted that direct-sales-to-consumers marketing, with its targeted approach centered on customer preferences, simplifies the agricultural product supply chain, and fosters stronger relationships between farmers and their customers. Quick adjustments and responses are also made easier by an uninterrupted flow of information, which helps farmers understand the needs of their customers and align crop production with market pricing estimates, resource availability, and target market preferences. This increases efficiency (Koreleska, 2008; Mick, 2019).

Studies have also shown that direct sales to consumers can bypass middlemen and still guarantee that goods reach their intended customers (Kádeková & Kretter, 2012; Minta & Uglis, 2018). Similarly, small and medium-sized farm owners can increase their revenue by obtaining a higher portion of the final price (Curtis et al., 2018; Wojcieszak-Zbierska & Bogusz, 2020). In contrast, traditional marketing strategies that frequently center on intermediaries and brokers have the potential to deprive farmers of their rightful earnings (Haque et al., 2022).

5. Implication and conclusion

This study has analyzed the difference in vulnerability between conventional and agritourism farmers during the COVID-19 period. It was revealed that the impact caused by economic disruptions during the pandemic was not uniform across all farmers. On average, conventional farmers outperformed agritourism farmers. Consequently, even though tourism-oriented farm diversification has huge potential, policymakers should bear in mind its vulnerability to external disruptions. The impact was diverse along the lines of involvement in the hospitality, capacity building, reliance on the international market through export, and value-addition practices. The study identified training abroad and direct sales marketing strategy as the best practices that made farmers more resilient and efficient. Contrarily, the production of export crops and lack of value-added were shown to have a negative influence.

Our results emphasize the importance of direct sales-to-consumer marketing for farmers who are looking for ways to reduce their vulnerability in the event of disruption. Direct sales to consumers ensure a smooth flow of products and align farmers with changing consumer preferences, thereby increase the agility required to thrive amidst disruptions. Further, the study calls for integrated training programs that are inclusive and adaptable across all ages to facilitate capacity building. Moreover, given the revealed vulnerability of relying on export crops, the study encourages farmers to produce a mix of export crops and food crops to reduce the risks. The study calls for players in Tanzania's agriculture sector to work toward reducing their dependence on global markets by strengthening local supply chains. Furthermore, this paper draws attention to the importance of making deliberate efforts to promote value-addition techniques among farmers to increase their resilience to market shocks.

In consideration of our findings, we can conclude that farming efficiency is profoundly influenced by factors related to market dynamics, supply chain disruptions, and adaptability to unforeseen externalities, as exemplified by the pandemic.

Finally, while conventional farmers generally outperformed agritourism farmers on average, agritourism as a subsector exhibited stronger performance compared to conventional tourism such as wildlife safari, mountain climbing and Island destinations. Unlike conventional tourism, agritourism diversification serves as a protective measure against disruptions such as travel bans, enabling farmers to sustain income streams through the sale of farm products. The unique blend of physical products and hospitality services in agritourism contributed to a more income stability, showcasing its risk aversion capabilities during crises like the COVID-19 pandemic. These observations suggest that agritourism holds promise for mitigating crisis impacts by

providing diversified income sources and strengthening resilience against economic shocks. However, further research is needed to explore the long-term sustainability and scalability of agritourism strategies in response to various crisis scenarios.

6. Limitation and future studies

Since in Tanzania the agritourism subsector is still in its infancy, the present study focuses only on efficiency and factors influencing efficiency in the early stages of agritourism projects. Although we were able to reflect the efficiency levels, the situation may differ during the maturity stage, when the agritourism subsector is already well established. The early developmental stage of agritourism, coupled with the COVID-19 context, may pose potential limitations impacting the generalizability of these results. To gain a better understanding, further research is required once agritourism is well established and outside the context of the COVID-19 pandemic. Such research would shed light on efficiency and related factors in non-crisis scenarios, offering valuable and more widely generalizable insights. Additionally, a research on the broader context of sustainability, emphasizing the importance of considering environmental and community impacts in agritourism development would offer valuable and more widely generalizable insights.

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Disclosure statement
The author(s) declare no potential conflict of interest.

Statement of Author Contributions
IK: Conceptualization, Methodology, Data collection and Analysis, Writing - Review & Editing; YO: Validation of the research design, validation of the results as well as reviewing and editing the manuscript.

References

Al-Mezeini, N. K., Oukil, A., & Al-Ismaili, A. M. (2020). Investigating the efficiency of greenhouse production in Oman: A two-stage approach based on Data Envelopment Analysis and double bootstrapping. *Journal of Cleaner Production*, *247*, 119160.

Anang, B. T., & Awuni, J.A. (2018). Effect of Training on Small-Scale Rice Production in Northern Ghana. *Applied Studies in Agribusiness and Commerce*, 12(3-4), 13-20.

Arita, S., Grant, J., Sydow, S., & Beckman, J. (2022). Has global agricultural trade been resilient under coronavirus (COVID-19)? Findings from an econometric assessment of 2020. *Food Policy*, *107*, 102204.

Ayanlade, A., & Radeny, M. (2020). COVID-19 and food security in Sub-Saharan Africa: implications of lockdown during agricultural planting seasons. *npj Science of Food*, *4*(1), 13.

Barichello, R. (2020). The COVID-19 pandemic: Anticipating its effects on Canada's agricultural trade. *Canadian Journal of Agricultural Economics/Revue canadienne d'agroeconomie*, *68*(2), 219-224.

Béné, C. (2020). Resilience of local food systems and links to food security–A review of some important concepts in the context of COVID-19 and other shocks. *Food security*, *12*(4), 805-822.

Binkley, J. K., & Liu, Y. (2019). Food at home and away from home: commodity composition, nutrition differences, and differences in consumers. *Agricultural and Resource Economics Review*, *48*(2), 221-252.

Binns, T., & Nel, E. (2002). Tourism as a local development strategy in South Africa. *Geographical Journal*, *168*(3), 235-247.

Bojnec, S., & Latruffe, L. (2008). Measures of farm business Efficiency. *Industrial Management & Data Systems*, 108(2), 258-270.

Boz, A. M. (2011). Leakages and value added in international tourism revenues, tourism satellite account as a measurement method. *International Journal of Business and Social Science*, *2*(24).

Canovi, M., & Lyon, A. (2019). *Family-Centred Motivations for Agritourism Diversification: The Case of the Langhe Region, Italy*. https://www.tandfonline.com/doi/full/10.1080/21568316.2019.1650104

Cattivelli, V., & Rusciano, V. (2020). Social innovation and food provisioning during COVID-19: The case of urban–rural initiatives in the province of Naples. *Sustainability*, *12*(11), 4444.

Ceylan, R. F., Ozkan, B., & Mulazimogullari, E. (2020). Historical evidence for economic effects of COVID-19. *The European Journal of health economics*, *21*, 817-823.

Chang, M., Liu, J., Shi, H., & Guo, T. (2022). The effect of off-farm employment on agricultural production efficiency: micro evidence in China. *Sustainability*, *14*(6), 3385.

Charnes, A., Cooper, W.W., & Rhodes, E. (1978). Measuring the efficiency of decision making units. *European journal of operational research*, *2*(6), 429-444.

Chenarides, L., Manfredo, M., & Richards, T.J. (2021). COVID-19 and food supply chains. *Applied Economic Perspectives and Policy*, *43*(1), 270-279.

Chimai, B.C. (2011). *Determinants of technical efficiency in smallholder sorghum farming in Zambia* (Doctoral dissertation, The Ohio State University).

Coelli, T.J., Rao, D.S.P., O'Donnell, C.J., & Battese, G.E. (2005). *An introduction to efficiency and productivity analysis*. Springer science & business media.

Cooper, W.W. (1999). Operational research/management science: Where it's been. where it should be going?. *Journal of the Operational Research Society*, 3-11.

Cooper, W.W., Seiford, L.M., & Tone, K. (2007). *Data envelopment analysis: a comprehensive text with models, applications, references and DEA-solver software* (Vol. 2, 489). New York: Springer.

Curtis, K.R., Allen, S., & Slocum, S. (2018). Fresh Produce Direct Market Sales Considerations.

Darnhofer, I. (2020). Farm resilience in the face of the unexpected: Lessons from the COVID-19 pandemic. *Agriculture and Human Values*, *37*(3), 605-606.

Davis, J.R. (2006). How can the poor benefit from the growing markets for high value agricultural products?. *Available at SSRN 944027*.

de Graaff, J., Kessler, A., & Nibbering, J.W. (2011). Agriculture and food security in selected countries in Sub-Saharan Africa: diversity in trends and opportunities. *Food security*, *3*, 195-213.

Dhungana, B.R., Nuthall, P.L., & Nartea, G.V. (2004). Measuring the economic inefficiency of Nepalese rice farms using data envelopment analysis. *Australian Journal of Agricultural and Resource Economics*, *48*(2), 347-369.

Duguma, L.A., Van Noordwijk, M., Minang, P.A., & Muthee, K. (2021). COVID-19 Pandemic and Agroecosystem Resilience: Early Insights for Building Better Futures. *Sustainability* 2021, 13, 1278.

Evans, E. (2012). Value added agriculture: is it right for me. *Obtenido de EDIS document FE638, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville: http://edis. ifas. ufl. edu/pdffiles/FE/FE63800. pdf (acceso: 31/05/2013)*.

Farrell, M.J. (1957). The measurement of productive efficiency. *Journal of the Royal Statistical Society Series A: Statistics in Society*, *120*(3), 253-281.

Frelat, R., Lopez-Ridaura, S., Giller, K.E., Herrero, M., Douxchamps, S., Djurfeldt, A.A., Erenstein, O., Henderson, B., Kassie, M., Paul, B.K., & Rigolot, C. (2016). Drivers of household food availability in sub-Saharan Africa based on big data from small farms. *Proceedings of the National Academy of Sciences*, *113*(2), 458-463.

Fried, H.O., & Tauer, L.W. (2016). The aging US farmer: should we worry?. *Advances in Efficiency and Productivity*, 391-407.

für Afrika, V.N.W. (2020). COVID-19: Lockdown Exit Strategies for Africa. *United Nations Economic Commission for Africa*.

Gabdo, B.H., Mansor, M.I., Kama, H.A.W., & Ilmas, A.M. (2018). Robust Efficiency and Output Elasticity of Broiler Production in Peninsular Malays.

Gordon, L.J. (2020). The Covid-19 pandemic stress the need to build resilient production ecosystems. *Agriculture and Human Values*, *37*, 645-646.

Gunther, A. (2020). COVID-19: fight or flight. *Agriculture and Human Values*, *37*(3), 591-592.

Haque, M.K., Zaman, M.R.U., Rahman, M.A., Hossain, M.Y., Shurid, T.I., Rimi, T.A., Arby, H., & Rabbany, M.G., 2022. A review on impacts of COVID-19 on global agricultural system and Scope for Bangladesh after pandemic. *Environmental Science and Pollution Research*, *29*(36), 54060-54071.

Hassen, A., Marwa, B.B., Hanen, A., & Amira, M. (2017). Analysis of the technical efficiency, pure and scale efficiency of rained cereal farms: case of the upper semi-arid. *Journal of Experimental Biology and Agricultural Sciences*, *5*(Spl 1-SAFSAW).

Henry, R. (2020). Innovations in agriculture and food supply in response to the COVID-19 pandemic. *Molecular plant*, *13*(8), 1095-1097.

Javed, M.I., Adil, S.A., Ali, A., & Raza, M.A. (2010). Measurement of technical efficiency of rice-wheat system in Punjab, Pakistan using DEA technique. *J. Agric. Res*, *48*(2), 227-238.

Kádeková, Z., & Kretter, A. (2012). Marketing of direct selling of agricultural products. *Zeszyty Naukowe SGGW, Polityki Europejskie, Finanse i Marketing*, 7(56), 38-44.

Kamdem, C.B. (2012). The determinants of marketing efficiency of cocoa farmer organization in Cameroon. *International Business Research*, *5*(9), 158.

Kapala, A., Kalinowski, J., & Minta, S. (2015). Sprzedaż bezpośrednia w Polsce na przykładzie produktów pochodzenia zwierzęcego. *Roczniki Naukowe Stowarzyszenia Ekonomistów Rolnictwa i Agrobiznesu*, *17*(4).

Karunarathne, A.C.I.D., Ranasinghe, J.P.R.C., & Nawarathna, A.M.D.B., 2019. Role of Stakeholders in Promoting Pro-Poor Tourism in Uva Province.

Kibuthu, E. K., Gitonga, Z. M., & Muchina, R. W. (2021). Effects of value addition on smallholder farmers' income: A case of tomato farmers in Laikipia County, Kenya. *Agricultural and Food Economics*, 9(1), 1-16.

Kim, S., Lee, S.K., Lee, D., Jeong, J., & Moon, J. (2019). The effect of agritourism experience on consumers' future food purchase patterns. *Tourism Management*, *70*, 144-152.

Kimaro, D., & Hieronimo, P. (2014). Land for agriculture in Tanzania: Challenges and opportunities. *Journal of Land and Society*, *1*(1), 91-102.

Koreleska, E. (2008). Sprzedaż bezpośrednia produktów ekologicznych (Direct sales of organic products). *Roczniki Naukowe Stowarzyszenia Ekonomistów Rolnictwa i Agrobiznesu XX (4)*, 177-179.

Li, H., Chen, C., Cook, W.D., Zhang, J., & Zhu, J. (2018). Two-stage network DEA: Who is the leader?. *Omega*, *74*, 15-19.

Li, K.X., Jin, M., & Shi, W. (2018). Tourism as an important impetus to promoting economic growth: A critical review. *Tourism management perspectives*, *26*, 135-142.

Liu, A., & Wu, D.C. (2019). Tourism productivity and economic growth. *Annals of Tourism Research*, *76*, 253-265.

Lordkipanidze, N., & Tauer, L.W. (2000). Farmer efficiency and technology use with age. *Agricultural and Resource Economics Review*, *29*(1), 24-31.

Mallory, M.L. (2021). Impact of COVID-19 on medium-term export prospects for soybeans, corn, beef, pork, and poultry. *Applied Economic Perspectives and Policy*, *43*(1), 292-303.

Mao, R., Jia, Z., & Chen, K. (2021). Impacts of import refusals on agricultural exports during pandemics: implications for China. *China & World Economy*, *29*(4), 113-141.

Mariyono, J. (2019). Farmer training to simultaneously increase productivity of soybean and rice in Indonesia. *International Journal of Productivity and Performance Management*, *68*(6), 1120-1140.

Meuwissen, M.P., Feindt, P.H., Midmore, P., Wauters, E., Finger, R., Appel, F., Spiegel, A., Mathijs, E., Termeer, K.J., Balmann, A., & de Mey, Y. (2020). The struggle of farming systems in Europe: looking for explanations through the lens of resilience. *EuroChoices*, *19*(2), 4-11.

Mick, H. (2019). Direct to consumer: Growing wine sales by strengthening online engagement with customers. *Australian and New Zealand Grapegrower and Winemaker*, (670), 78-80.

Minta, S., & Uglis, J. (2018). Znaczenie sprzedaży bezpośredniej w rozwoju obszarów wiejskich. *Intercathedra*, *35*(2).

Mwonge, L.A., & Naho, A. (2021). Determinants of credit demand by smallholder farmers in Morogoro, Tanzania. *African Journal of Agricultural Research*, *17*(8), 1068-1080.

NBS (National Bureau of Statistics). (2020). Key Findings on The National Sample Census of Agriculture, Livestock and Fisheries for Agricultural Year 2019/20. [2021-1-10]. https://www.nbs.go.tz/nbs/takwimu/Agriculture/Press%20Release_ENG_NSCA_01.12.2020.pdf

Odhiambo, N.M. (2011). Tourism development and economic growth in Tanzania: Empirical evidence from the ARDL-bounds testing approach. *Economic Computation and Economic Cybernetics Studies and Research*, *45*(3), 71-83.

Odhiambo, W., Nyangito, H.O., & Nzuma, J. (2004). *Sources and determinants of agricultural growth and productivity in Kenya* (No. 34). Kenya Institute for Public Policy Research and Analysis.

Ohe, Y. (2022). Investigating farmer's identity and efficiency of tourism-oriented farm diversification. *Tourism economics*, *28*(2), 535-558.

Ohe, Y., & Kurihara, S. (2013). Evaluating the complementary relationship between local brand farm products and rural tourism: Evidence from Japan. *Tourism Management*, *35*, 278-283.

Ohe, Y., & Ohe, Y. (2020). Evaluating Integrated On-Farm Tourism Activity After Rural Road Inauguration. *Community-based Rural Tourism and Entrepreneurship: A Microeconomic Approach*, 197-215.

Perrigot, R., Leleu, H., & Brodhag, C. (2009). Measuring the efficiency of French airports: A data envelopment analysis (DEA) approach. *Journal of Air Transport Management*, 15(2), 78-84.

Plourde, P. J. (2003). “Statement On Ethıcs And Travel”, CCDR (Canada Communicable Disease Report), An Advisory Committee Statement (Acs) Committee To Advise On Tropical Medicine And Travel (Catmat), Volume 29. Acs-9 1 October 2003

Saleh, M. (2020). Impact of COVID-19 on Tanzania political economy. *International Journal of Advanced Studies in Social Science & Innovation*, *4*(1), 24-36.

Shemdoe, R.S. (2011). Tracking effective indigenous adaptation strategies on impacts of climate variability on food security and health of subsistence farmers in Tanzania.

Sonnino, R. (2004). For a ‘piece of bread’? Interpreting sustainable development through agritourism in Southern Tuscany. *Sociologia Ruralis*, *44*(3), 285-300.

Tanzania invests. (2020, September 7). *Tanzania Agriculture*. Tanzania invest. https://www.tanzaniainvest.com/agriculture

Tauer, L. (1995). Age and farmer productivity. *Review of Agricultural Economics*, 63-69.

Tone, K. (2001). A slacks-based measure of efficiency in data envelopment analysis. *European journal of operational research*, *130*(3), 498-509.

Torero, M. (2020). Without food, there can be no exit from the pandemic. *Nature*, *580*(7805), 588-589.

Tourism, O.E.C.D. (2014). *the Creative Economy*. OECD Publishing: Paris, France.

Tripathi, H.G., Smith, H.E., Sait, S.M., Sallu, S.M., Whitfield, S., Jankielsohn, A., Kunin, W.E., Mazibuko, N., & Nyhodo, B. (2021). Impacts of COVID-19 on diverse farm systems in Tanzania and South Africa. *Sustainability*, *13*(17), 9863.

UNCTAD (United Nations Conference on Trade and Development). (2004). “*Tourism and Trade Development*”, http://www.unctadxi.org/templates/Print.aspx?id=956&lang=EN , 27.7.2007

UNEPTIE (United Nations Environment Programme Division of Technology, Industry, and Economics). (2007). “*Economic Impacts of Tourism*”, http://www.uneptie.org/pc/tourism/sust-tourism/economic.htm, 27 9. 2007

UNWTO. (2020). Tourism Highlights, 2020 Edition. Madrid: United Nations World Tourism Organization. https://www.e-unwto.org/doi/book/10.18111/9789284422456

Valdivia, C., & Barbieri, C. (2014). Agritourism as a sustainable adaptation strategy to climate change in the Andean Altiplano. *Tourism Management Perspectives*, *11*, 18-25.

Varshney, D., Roy, D., & Meenakshi, J.V. (2023). Impact of COVID-19 on agricultural markets: assessing the roles of commodity characteristics, disease caseload, and market reforms. In *Contextualizing the COVID Pandemic in India: A Development Perspective* (249-271). Singapore: Springer Nature Singapore.

Wang, C., Meng, X., Siriwardana, M., & Pham, T. (2022). The impact of COVID-19 on the Chinese tourism industry. *Tourism Economics*, *28*(1), 131-152.

Wang, L., & Yotsumoto, Y. (2019). Conflict in tourism development in rural China. *Tourism Management*, *70*, 188-200.

Weeden, G.T. (2008). *An examination of differences in financial performance among age cohorts* (Doctoral dissertation, Kansas State University).

Weible, C.M., Nohrstedt, D., Cairney, P., Carter, D.P., Crow, D.A., Durnová, A.P., Heikkila, T., Ingold, K., McConnell, A., & Stone, D. (2020). COVID-19 and the policy sciences: initial reactions and perspectives. *Policy sciences*, *53*, 225-241.

Wickens, T.D., & Keppel, G. (2004). *Design and analysis: A researcher's handbook*. Upper Saddle River, NJ: Pearson Prentice-Hall.

Wojcieszak-Zbierska, M., & Bogusz, M. (2020). Direct sales as an example of a distribution channel within the małopolskie region. *Roczniki (Annals)*, *2020*(1230-2020-1890).

Wooldridge, J.M. (2010). *Econometric analysis of cross section and panel data*. MIT Press.

World Bank. (2018). *Growing Africa: Unlocking the Potential of Agribusiness*. Retrieved from https://openknowledge.worldbank.org/handle/10986/29054

World Tourism Organization (2021), *International Tourism Highlights, 2020 Edition*, UNWTO, Madrid, DOI: https://doi.org/10.18111/9789284422456

World Trade Organization (WTO). (2020b). COVID-19 and Agriculture: *A Story of Resilience. Information* Note. August 26, 2020. https://www.wto.org/english/tratop_e/COVID-19_e/agric_report_e.pdf

Wright, D., Grand, A., MacLeod, B., & Abbott, L.K. (2018). Training as Part of the Capacity-Building Ladder in Australian Agriculture. *International Journal of Agricultural Extension*, 83-97.

Xayavong, V., Kingwell, R., & Islam, N. (2016). How training and innovation link to farm performance: a structural equation analysis. *Australian Journal of Agricultural and Resource Economics*, *60*(2), 227-242.

Yang, L. (2012). Impacts and challenges in agritourism development in Yunnan, China. *Tourism Planning & Development*, *9*(4), 369-381.