

# The interplay of tourism economy and food security in dessert-prone agricultural heritage sites

Tourism  
economy and  
food security

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## Abstract

**Purpose** – The purpose of this study is to examine how the tourism economy affects local food availability, access, utilization and stability in dessert-prone agricultural heritage sites. Specifically, the study aims to explore the relationship between the tourism industry and local agricultural practices and how this connection influences food security in the Siwa Oasis, located in the Western Desert of Egypt.

**Design/methodology/approach** – The study employs a qualitative exploratory research design using in-depth interviews and focus groups to investigate the impact of the tourism economy on food security and identify potential benefits and limitations for food security in the region.

**Findings** – The research reveals that the tourism economy in Siwa Oasis has only a marginal contribution to food security. The study highlights a lack of a strong connection between the tourism industry and local agricultural practices within the heritage site. As a result, the potential benefits and synergies that could be achieved between tourism and agriculture have not been fully realized, leading to a limited impact on food stability.

**Research limitations/implications** – This study primarily relies on qualitative data from Siwa Oasis, Egypt, which may limit the generalizability of findings beyond this specific context. Additionally, while the study provides valuable insights into the complex relationship between tourism and food security, it does not quantitatively measure the magnitude of tourism's impact. Future research could incorporate quantitative methods for a more comprehensive understanding of this relationship in diverse desert-prone regions. Finally, the study highlights the need for more integrated approaches to enhance food security through tourism, but the specific strategies and policy recommendations require further investigation and adaptation to local contexts.

**Practical implications** – This study underscores the need for tourism development strategies that prioritize food security in desert-prone areas like Siwa Oasis. Policymakers and stakeholders should promote sustainable tourism practices that enhance local agriculture, create diversified income sources and foster equitable benefits for communities. Moreover, recognizing the seasonal nature of tourism, interventions to address food shortages during off-peak periods are crucial. Efforts should also focus on skill development and gender-inclusive opportunities within the tourism sector to ensure broader community participation. Additionally, collaborations between tourism and agriculture should be encouraged to optimize food availability and stability while preserving cultural food traditions.

**Originality/value** – This study adds original insights by examining the specific impact of the tourism economy on food security in dessert-prone agricultural heritage sites. The study's originality lies in its exploration of the untapped potential for synergy between the tourism and agricultural sectors and the implications for local food security. This research contributes to understanding how tourism can improve food security in specific contexts and provides valuable insights into sustainable development in heritage sites.

**Keywords** Agricultural heritage sites, Food security, Food stability, Tourism, Siwa Oasis

**Paper type** Research paper

## Introduction

Siwa Oasis, located in the Western Desert of Egypt, is renowned for its unique agricultural cultural heritage and historical significance. With an increasing number of tourists, Siwa Oasis



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experiences the potential for economic growth and development (Asham *et al.*, 2022). However, it is essential to examine the impacts of tourism on the oasis's food security to ensure sustainability. Food security, encompassing availability, access, utilization and stability of food, is a fundamental aspect of human well-being and development (Berry *et al.*, 2015).

The existing approaches to studying the relationship between tourism and food security fail to acknowledge food security as a fundamental objective of tourism development. This narrow perspective overlooks the intricate and diverse connections that exist between tourism and food security. Previous research in the field of tourism and sustainable development has predominantly centered on the link between tourism and poverty reduction, without explicitly considering the specific challenges related to food issues (Scheyvens and Geographies, 2008; Sharpley and Naidoo, 2010; Spenceley and Meyer, 2012; Croes, 2014).

Thus, this article aims to investigate the linkage of the tourism economy and food security in Siwa Oasis. The main question is how tourism activities affect food security in terms of availability, affordability and cultural adaptability. By utilizing a qualitative data analysis from the fieldwork, the study seeks to explore the community perception of the tourism economy and analyses the potential implications for food security.

Understanding the relationship between tourism and food security in Siwa Oasis is crucial for policymakers, local communities, and tourism practitioners. This study's findings contribute to the existing literature on the intersection of tourism and food security, offering insights into the complex dynamics within a unique cultural heritage and desert environmental context. This article finds that the integration of tourism in Siwa Oasis falls short of effectively bolstering the food security of the local communities. Although tourism provides some support in terms of food availability, access and utilization, its overall effects on ensuring stable food conditions are minimal. This can be attributed to the tourism sector's inability to establish robust connections with local agricultural practices and the broader food system. As a result, the full potential benefits and synergies between tourism and agriculture have not been realized, leading to limited effects on food stability.

The study's findings have the potential to guide policymakers and tourism stakeholders toward sustainable practices that balance the economic benefits of tourism with the preservation of food security and cultural heritage in Siwa Oasis. The rest of the paper is organized as follows: a literature review on the linkage of the tourism economy and food security. This is followed by material and methods sections and the study findings. The last part of the paper reflects on the potential of the tourism economy in desert-prone agricultural heritage sites.

### **Theoretical background**

This study is grounded in the Sustainable Livelihood Framework (SLF), which elucidates the achievement of sustainable livelihoods through the utilization of various resources in diverse contexts (Scoones, 1998). The SLF, employed to understand the intricate interplay between tourism and food security, delineates five key components: livelihood assets, context, conditions and trends, moderating institutions and processes, livelihood activities (including tourism) and resultant food security outcomes (Ashely, 2000; Tao and Wall, 2009). By adopting the SLF, this study aims to develop a comprehensive understanding of challenges and impacts on various stakeholders at community and destination levels, considering food security as a subsystem of broader livelihood security (Connolly-Boutin and Smit, 2015). The framework facilitates the identification of how tourism, as an alternative livelihood, can address food security concerns in destination communities and establishes links between local-level livelihood activities and macro-level policies for potential intervention (Degarege and Lovelock, 2020). This study utilizes the SLF to connect tourism as a livelihood means with fundamental food security outcomes.

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### Key elements and factors of food security

Food security, a critical global concern, encompasses the availability, access and utilization of food that ensures individuals and communities have sufficient nutrition for a healthy and productive life (FAO, 2006). Understanding the key elements and drivers of food security is essential for addressing the challenges associated with hunger, malnutrition and food insecurity. This literature explores the key elements of food security and the key drivers influencing its attainment (FAO, 2022).

The concept of food security has evolved beyond a narrow focus on food production to encompass a multidimensional understanding. The widely accepted definition by the Food and Agriculture Organization (FAO) emphasizes four dimensions of food security: availability, access, utilization and stability (FAO, 2006). Availability refers to the physical presence of food, access relates to individuals' economic and physical ability to obtain food, utilization pertains to the proper nutritional use of food, and stability refers to consistent access to food over time (Weingärtner, 2009). This comprehensive definition acknowledges the complex nature of food security and recognizes the interplay of various factors influencing its achievement.

Several drivers shape the status of food security at global, regional and local levels. These drivers can be categorized into various dimensions, including socio-economic, political, environmental and technological factors. Socio-economic drivers exemplified in poverty and income inequality play a pivotal role in determining food security status. Individuals with limited resources often face difficulties in accessing an adequate and nutritious diet (Ogunniyi *et al.*, 2021). Studies have shown a strong correlation between poverty and food insecurity, highlighting the importance of addressing income disparities in achieving food security (Odoms-Young and Bruce, 2018). Additionally, employment and livelihood opportunities are critical factors influencing food security. Stable and decent employment can enhance household incomes, improving access to food and overall food security (Mutea *et al.*, 2019). Furthermore, the presence of social safety nets, such as cash transfers or food assistance programs, can act as a safety net for vulnerable populations, ensuring their basic food needs are met (Monchuk, 2013).

Governance structures that prioritize agricultural development, land tenure security, trade regulations and investment in rural infrastructure can contribute significantly to improving food security (Pingali *et al.*, 2005). On the other hand, political conflicts, civil unrest and unstable governance can disrupt food systems, leading to food shortages, displacement and compromised food security (Pingali *et al.*, 2005). Addressing political drivers is crucial for creating an enabling environment that supports food security initiatives. Further, environmental factors, particularly climate change, have significant implications for food security. Climate change impacts agricultural productivity, water availability and natural resource management, posing challenges to food security, particularly in vulnerable regions (Misra, 2014). Extreme weather events, such as droughts and floods, can also disrupt agricultural production and compromise food availability (Davis *et al.*, 2020). Adapting to and mitigating the effects of climate change is crucial in ensuring long-term food security.

### The relationship between tourism and food security

The linkage between tourism and food security is exemplified by SDG 2, which aims to eradicate hunger, ensure food security and improve nutrition through food security policy (UN, 2015). While SDG 2 emphasizes inclusive access to land, resources, knowledge, finance, markets and employment opportunities (UN, 2015), the role of tourism in relation to food security remains inadequately addressed or clarified. Recognizing this connection, the UNWTO acknowledges tourism's potential to enhance agricultural productivity by promoting local produce utilization and sales within tourist destinations, integrating it into the tourism value chain (UNWTO, 2023).

Most studies on tourism are devoting more attention to understanding how tourism affects food security and is striving to uncover the factors that determine the significance of tourism in this context (Getz *et al.*, 2014; Henderson, 2015; Martín *et al.*, 2018). However, despite claims that tourism can contribute to food security and sustainable development, scant attention has been paid to the mechanisms and factors that influence food security dynamics within tourist destinations. While the current body of literature on tourism and livelihoods recognizes tourism as a viable and sustainable means of income for local communities, it often overlooks the specific impacts on food security. The predominant focus has been on the direct advantages of tourism, such as employment opportunities and income generation, without adequately considering the wider implications for food security (Jelavić *et al.*, 2013; ILO, 2016; Gómez López and Barrón Arreola, 2019).

The existing studies suggest a prevalent belief in the potential of tourism to facilitate local development through its interconnections with other economic sectors (Arthur and Mensah, 2006; Saxena *et al.*, 2007; Newland and Taylor, 2010). Moreover, the relationship between tourism and food availability challenges has been explored from diverse angles (Telfer and Wall, 1996; Henderson, 2009). When agricultural production fails to meet expectations or households encounter difficulties in accessing affordable or imported food, the consequences for food availability become evident (Clover, 2003). These implications are relevant not only for food producers but also for households engaged in livelihood activities that are unrelated to food production (Pritchard *et al.*, 2019).

Several studies in developing countries linked between tourism and food security. Degarege and Lovelock (2020) emphasize the need to address the interplay between sustainable tourism development and food security in Ethiopia by highlighting the divergence between current tourism policies, centered on employment and poverty reduction and the imperative to explicitly integrate food security concerns into policy and practice for more effective outcomes (Degarege and Lovelock, 2020). In Tanzania, Anderson (2018) explores the linkage between tourism and agriculture using a value chain perspective, highlighting the potential for economic inclusivity by integrating local farmers into tourism food supply chains through the application of Porter's value chain analysis (Anderson, 2018).

While in Indonesia, Wijaya (2019) explores the rich and diverse food culture of Indonesia, emphasizing its potential as a strategic tool to enhance the country's tourism industry and underscores the importance of not just showcasing traditional foods but also communicating the socio-cultural values embedded in Indonesian cuisine for effective promotion in the international market (Wijaya, 2019). Furthermore, Addinsall *et al.* (2017) employ the Agroecology and Sustainable Rural Livelihoods Framework to investigate how agroecological tourism can serve as a sustainable approach to enhance the livelihoods of rural smallholders in South Pentecost, Vanuatu, addressing challenges related to climate change, underinvestment and competition for land and resources while promoting conservation and food security (Addinsall *et al.*, 2017). As well as, Filimonau and De Coteau (2019) present a critical review of food waste management in hospitality operations, in a framework based on core competencies, training needs, initial investment costs and potential monetary savings for managing food waste across different areas of hospitality operations (Filimonau and De Coteau, 2019).

Extant studies have shown that utilizing tourism as a comprehensive strategy for growth and development can help address the issue of food availability. By linking tourism with food production, tourism can boost agricultural productivity, leading to more food being available (Henderson, 2009). Moreover, the growth of food processing and manufacturing sectors influenced by tourism can also contribute to a greater supply of processed food (Bernstein, 2008). Furthermore, tourism's ability to generate income can empower individuals and communities, enabling them to afford and import food, thereby enhancing food availability (Scheyvens, 2002).

However, the existing empirical evidence regarding the relationship between tourism and food security is limited. Specifically, there is a lack of attention given to addressing all aspects of food security in the context of tourism research. Nonetheless, it is recognized that tourism can serve as an alternative livelihood option and potentially contribute to solutions for food security challenges, both direct and indirect relationships. However, it is crucial to acknowledge that the effectiveness of tourism in addressing food security issues can be influenced by the prevalence of food insecurity. This highlights the need for a food security-centered approach when examining the links between tourism and livelihoods. This study conducts empirical studies that explore tourism's role in relation to all components of food security, including food availability, food access, food utilization and stability. This study provides valuable insights for policymakers and researchers seeking to address the challenges and opportunities at the intersection of tourism and food security.

### The case study: Siwa Oasis

The Siwa Oasis (Wāḥat Siwah) is situated in the Western Desert, specifically within the Qattara Depression and the Great Sand Sea. It is positioned approximately 50 km to the east of the Libyan border and around 560 km away from Cairo the capital city. It is known for its drought-prone conditions (Figure 1) (Eldomeriy, 2005). Siwa is also known for its rich cultural, agricultural and natural history, dating back to the late Egyptian antiquities, Greek and Roman periods, making it an interesting case study for examining the impacts of tourism on food security

Siwa's tourism potential is evident in its designation as a Globally Important Agricultural Heritage Site/System (GIHAS) of FAO in 2016 and its inclusion in the tentative lists of UNESCO since 1994 (FAO, 2016; UNESCO, 2023). In addition to that, its designation as a national protected Area in 2002 further highlights its ecological significance (EEAA, 2006). The region's abundant biodiversity, including various animal species and migratory birds, adds to its appeal as a tourism destination (Nabhan, 2007). Investigating the impacts of tourism on food security in Siwa can shed light on the dynamics and complexities of this relationship and contribute to our understanding of sustainable development in tourism destinations.



**Figure 1.** Case study area, Siwa Oasis based on the general organization for physical planning of Egypt (GOOP)



Agriculture is the mainstay of Siwan's economic, social and political structure where its community is dependent on subsistence agriculture for their livelihoods (Hedia and Abd Elkawy, 2016). Siwa has a variety of date palm cultivars, with approximately 700,000 palm trees producing around 84,000 tons annually at a rate of 120 kilograms per tree; this accounts for about 2% of Egypt's total date production. The oasis is also an important producer of olives, with a total annual production of 27,500 tons (Raid, 1996; Hassan, 2021). Its other agricultural products, such as citrus fruits and vegetables, have a rich historical heritage dating back to the past.

Agricultural systems in the oasis are based on the cultivation of date palms alongside other crops, such as olive and barley trees, among others (FAO, 2016). The food situation in Siwa Oasis is significantly impacted by both drought and insufficient institutional capacity (Alary *et al.*, 2014). These factors contribute to challenges in ensuring food security and meeting the nutritional requirements of the local community. In response to these challenges, the promising pathway for achieving sustainable development in the country is the development of the tourism sector, which holds great potential in Siwa Oasis. In addition, the Siwa Oasis, recognized as a prominent tourism destination in Egypt, boasts a remarkable tangible and intangible heritage that bears witness to its extensive historical evolution. One notable element is the Shali fortress, constructed in the 12th century CE utilizing Kashif, a composite mixture of salt and mudbrick (Figures 2 and 3) (Fakhry, 1973).

Another noteworthy attraction within Siwa is the Gebel el-Mawta, commonly referred to as the "Mountain of the Dead." (Figure 4). Situated atop a hill adjacent to historical Siwa, this necropolis served as the burial site for Siwans throughout the 26th Dynasty until the Ptolemaic (Greek) and Roman periods (Eldomeriy, 2005). Among the significant archaeological heritages is the Temple of the Oracle of Amun (Figure 5), constructed approximately 2600 BP. Its renown emanates from two historical events: the visit by Alexander the Great and the ill-fated expedition of the Cambyses army (Fakhry, 1973).

Additionally, the Temple of Umm Ubayda, built around 2,400 years ago during the 30th dynasty, stands as a revered sanctuary dedicated to the venerable ancient Egyptian deity Amun (Müller, 2012). In close proximity to the village of Aghurmi lies the Cleopatra Spring (Figure 6), an ancient water source potentially utilized for countless millennia. Surrounded by groves of date palm trees, it exemplifies the existence of over 200 operational "Roman wells" dispersed throughout the oasis (Belgrave, 1923).



**Figure 2.**  
The houses inside  
Shali Citadel

Source(s): Author



Source(s): Author

**Figure 3.**  
The outer shape of the  
Shali Citadel



Source(s): The author

**Figure 4.**  
Mountain of the dead  
“Gebel el-Mawta”



**Figure 5.**  
The temple of  
the Oracle

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**Source(s):** The author



**Figure 6.**  
Cleopatra spring,  
called (Eye of the Sun)

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**Source(s):** The author



Siwa Oasis showcases cultural diversity. The community residing in the oasis comprises individuals from different 12 tribes, including indigenous inhabitants of the Berber group (Vivian, C., 2002). The preservation of their cultural practices, such as using the Amazigh/Siwi language and continuing traditional crafts, demonstrates the cultural richness within the oasis. Moreover, the oasis serves as a repository of indigenous knowledge related to agriculture, including the cultivation, and harvesting of date palms and post-harvest practices that require specific agricultural techniques (Vale, 2014).

The oasis's landscape diversity contributes to its appeal as an agricultural heritage site (Figure 7). The combination of green areas, date palm gardens, fruit orchards and scattered medicinal plants creates a visually captivating and contrasting environment within the arid desert surroundings (Serreli and Schiattarella, 2021). This diverse landscape is a testament to the oasis's ability to adapt to challenging desert conditions and showcases the aesthetic value of the site. Furthermore, the Siwa Oasis harbors remarkable biodiversity, the oasis provides a habitat for rare medicinal plants and supports a diverse array of fauna, including reptiles and birds (Saleem, 2012; Soliman and Mohallal, 2014). This biodiversity contributes to the ecological significance of the oasis, enhancing its appeal to visitors interested in both cultural and natural heritage.

Despite the tourism potential, the development of tourism as a sector has been overlooked until recently, with a growing recognition of its potential as a driver of development (Amara, 2010; Alhaddad *et al.*, 2017). Nature-based and cultural tourism have been identified as promising means of generating economic growth and employment (Kennedy, 2007; Ayad and Shujun, 2013). However, the challenges posed by drought and instability continue to hinder the realization of these aspirations.

Siwa's tourism industry commenced its journey in the 1980s, with the peak season aligning with Ramadan and Easter holidays. In the year 2010, approximately 1,000–1,400 foreign visitors, alongside 800 Egyptian tourists, explored the oasis within a single month (FAO, 2016). The tourist numbers have soared to numerous each year, with no specific figures available since the last census in 2010.



Source(s): The author

Figure 7.  
Siwan agricultural  
landscape

## Methodology

The study adopts a qualitative exploratory research design with the aim of gaining a deeper understanding of key issues related to the impacts of tourism on local food security in Siwa Oasis (Stebbins, 2001). To achieve the study's objectives, data was collected through qualitative in-depth interviews with key informants and focus group discussions (FGDs) (Morgan, 1997). This allowed for a comprehensive exploration of tourism economy and its effects on local food security at the community level.

The interviews were conducted face-to-face from March to September 2021, and all interactions were recorded with the participant's consent. The interviews focused on capturing information about the participants' living conditions, livelihoods, food security history, changes in their social, cultural and economic realities, and the relationship between tourism and food security. The FGDs aimed to gain a deeper understanding of the challenges of tourism development, development interventions and how different stakeholders perceive the connection between tourism and food security.

Key informants were selected based on their residency in the study area, their experience and their role in relation to the research topic. To enhance the validity and reliability of our findings, the methodology employed data triangulation, combining information gathered through interviews and FGDs. This approach helps ensure that our results are robust and reflective of the diverse viewpoints within the community.

The informants included members of the local communities, community leaders, tourism workers and government officials. The local participants consisted of (1) tribal leaders responsible for the community's well-being and were in contact with other local administrations. (2) A community member (often the head of the family) operating in farming and related occupations like government services, operators in the industries, trading and retail (3) A community member operating in farming and occupation in tourism (e.g. transport, tourism services). In agricultural heritage areas, it is believed that most local people may earn their living from the agricultural sector, tourism and trade sectors. Thus, to reduce bias, the information of an occupation other than the agricultural sector.

Regarding policy and administration, local administrative agencies' officers and NGO officers were chosen using the snowball technique. This was to understand how their roles have influenced community livelihoods and the effect of the site policies and management/governance on community people from the perspective of the local administrative agencies' officers and NGO officers. This information has to be involved in their position for over three years as they were assumed to know the problems and provide the experience of areas including the agricultural heritage management/policy and local people's livelihood. They also reflect the condition of the issues and solutions implemented by the government sector. Governmental representatives include the City Council, the Ministry of Tourism and Antiquities (MoTA), the Egyptian Environmental Affairs Agency (EEAA), the Desert Research Center (DRC), the Ministry of Agriculture and Land Reclamation (MALR), the Agriculture Directorate and the Faculty of Desert and Environmental Agriculture of Marsa Matrouh. In total, 40 in-depth interviews and 5 FGDs with 5 participants each were conducted.

The data collected from the interviews and FGDs were transcribed into Arabic and then translated into English. The data were analyzed qualitatively through narration and interpretation, identifying themes and generating conceptual generalizations. This thematic data analysis involved a process of becoming familiar with the data, generating initial codes, searching for recurring themes, reviewing and defining the themes and finally producing the research findings.

The demographic characteristics of the study participants are presented in [Table 1](#). More participants were enrolled in in-depth interviews (57%) than FGDs (43%). Similarly, more men (81%) participated in the study than women (19%). The reason for this can be attributed to the prevailing social norms in Siwa communities where more men participated in decision-

**Table 1.**  
Demographic  
characteristics of the  
study participants

(N = 70)	Frequency
<i>Interview type</i>	
In-depth interview (40)	57
FDG (avg. of 5 per discussion = 25)	43
<i>Gender</i>	
Male	81
Female	19
<i>Age</i>	
18–25 yrs	23
26–30 yrs	22
31–45 yrs	27
46–60 yrs	17
Above 60 yrs	11
<i>Marital status</i>	
Single	26
Married	63
Widow	5
Divorced	6
<i>Level of education</i>	
No degree	15
Primary education	47
Secondary (high) education	30
University education	5
Post-graduate education	2
<i>Job status</i>	
Permanent	20
Intermittent	28
Temporary	17
Seasonal	35
<i>Source of income</i>	
Government employee	12
Agriculture	40
Tourism employee	20
Industrial employee	21
Self-employed (Business, trade, handicraft)	7

making in the public sphere than women do. 40 and 20% of the study participants were farmers and tourists service providers respectively while 12% were government representatives. Overall, the age of the participants ranges from 18 years to 60 years and above. Most participants fall within the category of 31–45 years. This also accounts for more representation of married men and women than unmarried ones.

## Results

The results highlighted the complex interplay between tourism development and food security in Siwa Oasis. The results explore community perception of food security from different perspectives, including the various ways in which tourism activities influence local food security, food affordability, availability, food consumption and food stability. While tourism may bring economic benefits, it may also pose challenges including changing food availability, food affordability and consumption habits, and this has environmental and cultural implications too.

### Community perception of food security in desert-prone areas

Participants shared different perspectives about what it means to be food secure, especially with respect to food availability and consumption. It emerged that food security has different connotations: the sense of uncertainty about where the next meal will come from, the availability of varieties of food for consumption, divine providence, a stable climate and rich soil for planting and pump harvesting (FDG. 1). For example, some participants associated food insecurity with a complete lack of food, scarcity of preferred staple items, quantity of food intake and limited options for food variety. One community leader highlighted that not having enough food to feed their families was a red line for food security.

Feeling uncertain about where our next meal will come from is a red line for me when it comes to the experience of food security. Struggling to grow our staple crops and raise livestock to meet our needs (Local Farmer, 13).

Further, it emerges that availability of food is associated with divine providence in which people. The community leader shared that food was ultimately dependent on the will of God, who was the ultimate provider (Local Farmer, 14). Some participants shared that they rarely experienced food insecurity in their local communities, but natural factors such as adverse climate change affected crop yields and the varieties of food available for local consumption. Most participants identified themselves as being food secure indicating that food production in Siwa Oasis heavily relies on date palm cultivation with several varieties especially Saidi and Freihi, with additional crops such as sorghum, cucumber, zucchini, apple, guavas and bananas being cultivated to a limited extent for household consumption (FDG. 1).

In contrast, other participants highlighted that the cultivation of certain vegetables and fruits in Siwa Oasis is constrained by specific environmental factors. The participants pointed out that the high salinity of the soil and the arid climate poses challenges to the successful growth of certain crops. For instance, although rice was introduced to the oasis, its cultivation proved to be unviable due to the presence of mosquitoes and malaria parasites associated with the stagnant water required for rice cultivation. As a result, the cultivation of vegetables is relatively abandoned in Siwa Oasis. Other challenges shared by the participants include scarcity of land for farming due to population growth, aridity, weather fluctuations, and the lack of political will to address the reoccurring challenges (Interview 1, Government Representative).

Local leaders shared that the demand for most fruits and vegetables in Siwa Oasis is primarily met by sourcing them from the Nile Delta region. The accessibility and availability of these produce items from the Nile Delta are relatively higher compared to locally grown varieties in Siwa and the surrounding villages. However, there are a few fruits and vegetables that are exceptions to this trend, suggesting that they can be successfully cultivated in Siwa Oasis despite the constraints.

The construction of the Siwan road between the main cities has facilitated the introduction of a diverse range of vegetables and fruits in the region (Vivian, C., 2002). While these produce items were abundant and readily available in other parts of Egypt, Siwa Oasis had remained isolated for centuries, resulting in limited access to such varieties (Eldomeriy, 2005). However, starting from the 1990s, a significant influx of new vegetables and fruits has been introduced to Siwa Oasis, bringing about the increased availability of these produce items in the local community (FAO, 2016).

With respect to access to livestock in Siwa Oasis, the participants experience scarcity in terms of availability, accessibility and affordability. One participant specifically mentioned that cattle are predominantly accessible to individuals with higher wealth, whereas sheep, goats and chickens are the predominant livestock species within the local community (Interview 14, Local Farmer).

The Bedouin population, coexisting with the Berbers in the area, possess the largest number of livestock and play a significant role in supplying livestock to the community market. Additionally, it was revealed that camels (traditionally eaten) cannot thrive in Siwa

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Oasis due to their susceptibility to prevalent diseases in the region, which poses a challenge to their survival (Interview 15, Community Leader).

### **Tourism activities and local food security**

In this section, I explore the various ways in which tourism activities influence local food security in Siwa Oasis. The results highlight both the positive and negative aspects, such as changes in food availability, access to nutritious food, income generation opportunities and the potential risks of dependency on tourism.

Participants held diverse perspectives on how tourism activities affect food security in their localities. Some participants who directly engaged in tourism activities highlighted the significant role of tourism as a source of livelihood income. They acknowledged the evolution of tourism as a means of sustenance, stating that tourism has progressed over the years, becoming more organized and offering diverse opportunities for economic benefits (FDG. 2). Other participants noted that in the past, the benefits derived from tourism were limited to earning income from foreign tourists and engaging in individual tasks such as serving as security guards at archaeological sites (Interview, 21, Tourism Workers).

Tourism has breathed new life into our oasis and revitalized our food security. Through tourism opportunities, we have seen an increase in income and employment, providing us with the means to meet our dietary needs and enhance our livelihoods (Interview 22, Tourism Worker).

In contrast, the interviews conducted with the participants who were not directly involved in tourism activities commonly revealed little or no effect of tourism on their ability to secure enough daily meals. They expressed skepticism about the ability of tourism jobs to address food insecurity comprehensively, arguing that income and employment generated solely from tourism would not address food shortage (Interview 23, Tourism Worker). One community leader shared that not everyone in the community benefited from tourism and it would be challenging to accrue any benefits from the sector in the future.

While tourism may bring economic opportunities, it has not proven to be a panacea for our food security challenges. The benefits seem to be limited to a select few, while most of our community still struggles to access nutritious food (Interview 24, Community leader).

During the focus group discussions, participants expressed concerns regarding the gender disparities in benefit-sharing within the tourism sector. They highlighted the absence of well-designed mechanisms to ensure the inclusion and participation of women. According to participant statements, unmarried women are engaging in tourism-related activities outside their homes, such as employed in industries such as salt artifacts and packing dates. On the other hand, married women are constrained to working exclusively from home, focusing mainly on embroidery and Siwan decorations' "motives" due to cultural norms. The participants also highlight that fewer women benefit from tourism due to prevailing social norms, as a result, women only rely on seasonal farming for livelihood compared to men who had to switch to tourism sectors when there are fewer farming activities during the dry season (FDG. 2) An NGO involved in the discussion acknowledged the need for intervention, stating,

we recognized the importance of providing educational support to enhance the embroidery skills of Siwan women for tourism commercial purposes. we collaborated with external instructors who were brought in from outside the oasis to improve the quality of embroidery work and handicrafts from palm fronds, making it more marketable and enabling women to derive economic benefits from their craftsmanship (Interview 7, NGO Representative).

Furthermore, the participants indicated that participants widely shared the belief that tourism primarily benefits only a small portion of the community. Furthermore, participants



from local communities highlighted the negative impact of tourism on their food availability and consumption.

Participants stated that a small portion of the local community is able to reap the advantages offered by the tourism sector while other participants expressed that, the unequal benefits in the tourism sector have detrimental effects on food security in Siwa; this is primarily due to the lack of strong connections and collaborations between tourism and agriculture. As a result, the potential for tourism to contribute to agricultural development and enhance food security is hindered (FDG. 2).

The participants revealed that the tourism industry in Siwa Oasis operates under the framework of “Siwan Sons,” which comprises an umbrella association and a few individual businesses and retail establishments concentrated in the city center. This organizational structure facilitates the creation of broader networks of employment opportunities for the local population, especially the youth. Some participants corroborated this perspective, highlighting the positive impact of community development projects supported by tourism-related activities with (NGOs) and the private sector. However, participants emphasized the need for better structuring of these initiatives to maximize the benefits derived from tourism (Interview 25, Tourism Worker).

Through group discussions, participants expressed that despite the aim of development in policies, the impact of tourism on agricultural development was limited and not as strong as desired due to a weak local value chain. Participants aspired to sell their agricultural products through several channels including local markets, cooperatives, community-supported agriculture programs, restaurants, hotels, and even direct sales to individual consumers, which can help them mitigate the challenges posed by limited access to tourism industries and maximize their market opportunities.

We support traditional farming practices in Siwa Oasis, advocating for Organic and Halal certifications. These certifications boost market opportunities and competitiveness for Siwa Oasis date products domestically and internationally (Interview 6, NGO Representative).

Another participant mentioned that the local agricultural products related to heritage/traditional farming activities in Siwa Oasis are not currently considered for tourism development due to a lack of awareness or recognition of their potential as tourism offerings, limited resources, and most of the initiatives, focus on other tourism attractions seeing or activities, and possibly a preference for more mainstream or commercially viable options (Interview 26, Tourism Worker).

### **Tourism, food affordability, and availability**

Tourism activities have the potential to increase agricultural productivity through increased purchasing power of farmers who sell their products to tourists. Some participants highlighted the crucial role of tourism income generation that improve the local agricultural value chain in Siwa Oasis. Although the economic benefits of tourism for food security were seen as marginal due to limited income in the area, participants still recognized tourism as the most significant activity for increasing incomes. This is attributed to the presence of multiple tourism-related employment opportunities and income-generating activities in the community. The ability of the farmers to switch to the tourism sector after the harvesting period when there are fewer farming activities affects how they cope with food shortage and inflation (FDG. 3).

Participants shared that they participated in hospitality, tour guiding, transportation, handicraft production and other tourism-related services. The diversity of tourism activities provides community members with different employment options, allowing them to earn income and improve their livelihoods. It involves the exchange of money as a form of payment

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for the goods or services offered by community members to tourists. A few participants shared that tourism income has helped alleviate their financial constraints and provided them with agricultural activities (Interview 27, Tourism Worker).

In the past, we often faced cash shortages, especially during the dry season when there were few agricultural and tourism activities to generate income for purchasing agricultural inputs. However, the tourism income we receive is still relatively small (Interview 6, NGO Representative).

Similarly, participants mentioned that tourism income has facilitated the use of productive inputs for farming. They explained that the money from tourism has partly supported the purchase of improved seeds for fruits and vegetables. It was also acknowledged that tourism contributes to some extent to business development related to agriculture, although its impact may not be substantial or easily noticeable (Interview 17, Local Farmer). For example, certain farmers engage in animal husbandry activities, such as raising poultry and sheep, to sell their products to hotels and tourist camps. No additional forms of direct support from the tourism sector, such as corporate social responsibility initiatives, were mentioned by the participants. Furthermore, none of the participants were able to identify any specific interventions specifically aimed at supporting the agriculture sector (Interview 29, tourism worker).

### **Tourism and food consumption**

Tourism activities affect food consumption in terms of quantity and quality, energy and nutrient requirements. Participants shared that the growth of tourism activities in Siwa Oasis affected food storage, cooking methods, food processing and changes in consumption patterns and dietary habits. They highlighted several key themes related to tourism and food consumption, including the effects of tourism on dietary habits and the cultural aspects of food consumption in the community, as well as the relationship between tourism employment and food consumption (FDG. 4).

The participants expressed that tourism has led to changes in their dietary habits, prompting local communities to adopt new ways of preparing and consuming food. Engaging in tourism provides opportunities for sociocultural exchange with visitors, influencing their food choices and preferences (Interview 31, Tourism Worker). One local community leader mentioned their personal experience, stating that their food habits and the types of food they feed their family have changed since participating in tourism, mentioning a shift from eating traditional Siwan dishes like Tagellan intent (made from ground dates and wheat flour) to consuming bread and tea for breakfast, inspired by tourists and guides. However, another participant mentioned that affordability became a concern for many of them due to changing cultural dietary habits (Interview 16, Community leader).

Similarly, other participants shared how tourism has influenced household food consumption habits. They mentioned incorporating new food items like rice and pasta into their diets, which were not previously part of their meals. The change in food consumption was attributed to increased awareness and availability of such items in the Siwan city center market. However, the participants referred to that the cost and the need for additional ingredients attached to it especially meat posed financial challenges. Participants acknowledged that although a packet of pasta could sufficiently feed their family, they could cover a whole day's consumption by spending the same amount of money on locally accessible staple foods like wheat or flour. Most of the participants expressed that those limited financial resources acted as a constraint on adopting new food practices, highlighting the relatively small magnitude of tourism benefits and their impact on food habits (FDG. 4).

Additionally, participants mentioned the motivation to purchase certain food ingredients that were not traditionally consumed, which they attributed to their interactions with

tourism. Community leaders shared that there was increased awareness of vegetables and fruits as new food items and the adoption of fuel-saving stoves for cooking after Siwan *Infath* “Opening” of tourism. The use of fuel-saving stoves was seen as beneficial because it saved firewood and contributed to healthier cooking practices compared to traditional stoves (Interview 20, Community leader). However, the participants noted that such changes in behavior and perception were hindered by a lack of resources, particularly income. This indicates that the limited financial gains from tourism employment and the interplay with food practices pose challenges to the overall impact of tourism on food utilization. Some participants also highlighted the financial constraints faced by tourism workers, making eating outside or in restaurants unaffordable (FDG. 4).

### **Tourism and food stability**

The seasonality of tourism affects food stability in agricultural heritage sites. For example, participants highlighted the seasonal nature of tourism in Siwa Oasis and its implications for food security. They noted that employment opportunities in the tourism sector were limited and irregular, resulting in small and unstable incomes. This unpredictability affected the ability of households to acquire sufficient food, especially during the summer season (June to September) (FDG 5).

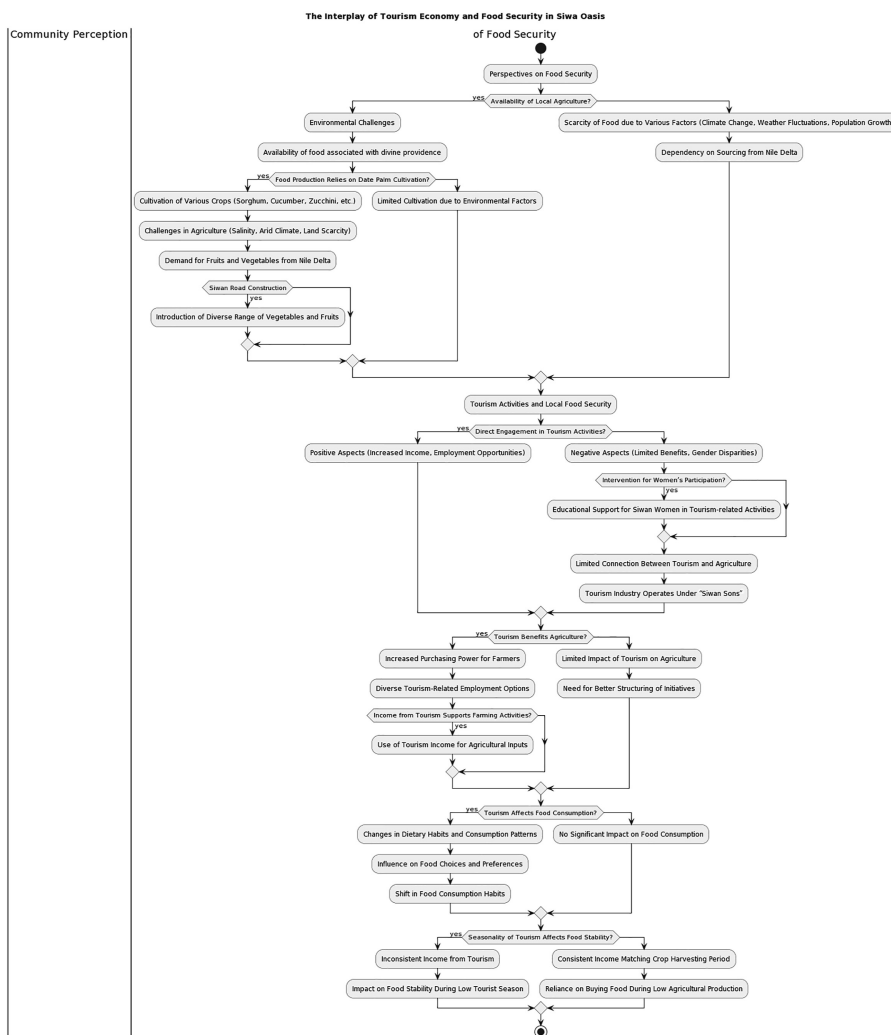
The income we got from tourism was inconsistent, usually matching the time when we harvested our crops. However, it wasn't sufficient to guarantee our food security. As a result, we had to turn to traders and individuals to borrow money so we could buy enough food (Interview 14, Local farmer).

The participants revealed that the peak tourism season in Siwa Oasis coincided with the crop harvesting period when food security conditions were relatively better. Conversely, the low tourist season corresponded to the months with the highest prevalence of food shortages (Interview 35, Tourism worker). One farmer expresses that because we have small plots of land that don't yield many different fruits and vegetables, it's challenging for us to grow enough crops to feed our families throughout the year (Interview 21, Local farmer). As a result, we have to rely on buying food from the market using the money we earn from different sources. It's a way for us to make up for the shortfall in our own agricultural production (Interview 40, Local farmer) (see [Figure 8](#)).

### **Discussion and implications**

Gaining insight into the connections between tourism and SDG2 (Sustainable Development Goal 2) requires both theoretical and empirical exploration. This study took a comprehensive approach, considering multiple perspectives from various stakeholders, to examine the perceived effects of tourism on the food security of local communities. Specifically, the research focused on tourism destinations in Siwa, Egypt. Utilizing the sustainable livelihood framework as a guide, this investigation revealed a wide range of perspectives regarding the link between tourism and food security. The results indicate that, overall, the advantages of tourism appear to be modest, with only a few community members experiencing significant benefits.

While participants acknowledge that tourism can provide income to support their food security, they rarely view it as a primary source ([Leith, 2020](#)). Instead, tourism is generally perceived as playing a minor role in this regard, none of the participants rely solely on it to meet their household's food needs, which is confirmed in other parts of the world such as South Africa and China ([Zhang et al., 2017](#)). Although some community members recognize tourism's contribution to their food security, they still prioritize agriculture as a more reliable means. Agriculture is valued not only for its direct provision of food but also for its indirect benefits, such as generating income ([Swinton et al., 2007](#)).



Source(s): The author

**Figure 8.**  
The interplay of tourism economy and food security in Siwa Oasis

Furthermore, participants raised valid concerns regarding the disadvantageous consequences of tourism on the food security of their communities (Lawson *et al.*, 2014). They provided concrete examples where local residents, particularly those employed as guides in the tourism sector, encountered challenges in obtaining an adequate food supply. Moreover, the prioritization of constructing eco-friendly hotels and resorts by exploiting agricultural resources was identified as a significant factor contributing to crop damage caused by the expansion of tourism. This unfortunate outcome directly impacted the overall production of food in the area. Through these observations, it becomes evident that tourism has indirect negative effects on the availability and sustainability of local food resources, highlighting the need to address these issues for the well-being of the community (Telfer and Wall, 1996).

Through the interviews conducted, it became evident that the presence of tourism in the Siwa Oasis has brought about noticeable alterations in various aspects related to food culture. [Ayad and Shujun \(2013\)](#) has found that local people's attitude changes towards social, economic and environmental due to the impact of tourism in Siwa Oasis with also other parts of agricultural heritage oases in Egypt (e.g. Kharga Oasis) ([Ayad and Shujun, 2013](#); [Ayad et al., 2015](#)). These include the availability of food, the methods of food preparation and consumption, as well as the overall stability of the food situation. Tourism has acted as a catalyst, creating opportunities for income generation, employment, social and cultural exchange and the sharing of experiences among the locals ([Alhaddad et al., 2017](#)). Nevertheless, the study's findings suggest that tourism's current impact on agricultural productivity and the financial well-being of heritage farming communities remains limited.

The current state of tourism in the Siwa Oasis falls short of meeting the diverse needs and food security challenges the local community faces. While tourism income does play a role in supporting households' access to food through market purchases, its significance depends on the overall earnings of the household and the proportion that tourism income represents. Participants in the study emphasized the need for improvement in the quality of existing tourism offerings and the development of new products that can benefit the entire community which was approved by ([Khalil and Fathy, 2021](#)). However, it is important to note that the perceived contribution of tourism to food security primarily revolves around its immediate economic impact on the local communities. There seems to be a lack of recognition regarding the potential of a broader link between tourism and agriculture as a means of addressing food security concerns in a more comprehensive manner.

The findings of the study reveal a significant gap between the tourism sector and agriculture in terms of their impact on the food security of the Siwa Oasis community ([Asham et al., 2022](#)). It is evident that the current state of tourism is insufficient in providing the necessary support for local communities' food security ([Elgammal, 2022](#)). Therefore, there is a pressing need to foster a more integrated approach where tourism and agriculture work hand in hand. This entails developing a tourism model that not only shows interest in food but actively contributes to the production and enhancement of local agricultural practices.

### Implications

This study stands out as a unique and comprehensive study of the link between tourism and food security in the case of Siwa Oasis. Unlike previous research that mainly concentrated on the broad effects of tourism, such as income generation and job opportunities, this study delves into the specific dynamics and consequences related to food security. It fills a significant gap in the existing literature, which has predominantly overlooked the intricate developments and outcomes that shape food security within the context of tourism development ([Addinsall et al., 2017](#); [Ambelu et al., 2018](#); [Degarege and Lovelock, 2018](#)).

The results of this study highlight that establishing mutually beneficial relationships between tourism and agriculture is crucial for addressing long-term food security concerns. Previous research conducted by [Heitmann et al. \(2011\)](#), [Henderson \(2009\)](#), [Santafe-Troncoso and Loring \(2021\)](#) also supports the notion that tourism can play a positive role in addressing food security issues ([Heitmann et al., 2011](#); [Henderson, 2009](#); [Santafe-Troncoso and Loring, 2021](#)).

However, this study reveals a parallel with [Pillay and Rogerson \(2013\)](#), [Rogerson \(2012a, b\)](#); [Torres \(2003\)](#) demonstrating that the limited linkages between tourism and agriculture have constrained the potential of tourism to enhance food availability and overall food security. Nevertheless, there are indications that tourism can still offer some support to local



farmers in their efforts to protect and ensure food security. The identified perspectives shed light on the potential capacity of tourism to contribute to the local food security landscape.

Particularly, this study aligns with the findings of [Pillay and Rogerson \(2013\)](#) by highlighting that the existing connections between tourism and agriculture are not extensive enough to fully leverage tourism's potential to enhance food availability and overall food security. However, the study also identifies perspectives that identify the capacity for tourism to assist farmers in safeguarding local food security.

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The existing approach to studying the relationship between tourism and food security in the case of Siwa Oasis fails to acknowledge food security as a fundamental objective of tourism development. This narrow perspective overlooks the intricate and diverse connections that exist between tourism and food security. Previous research in the field of tourism and sustainable development has predominantly centered on the link between tourism and poverty reduction, without explicitly considering the specific challenges related to food issues ([Croes, 2014](#); [Scheyvens, 2002](#); [Sharpley and Naidoo, 2010](#); [Spenceley and Meyer, 2012](#)).

This study takes a unique approach by applying the sustainable livelihood framework to analyze the interconnections between tourism and food security in the context of Siwa Oasis. By examining both direct and indirect relationships, it delves into the intricate dynamics between tourism and the perceived outcomes of food security in local communities. This exploration enables a deeper understanding of the role tourism plays in achieving Sustainable Development Goal 2 (SDG2), which focuses on zero hunger and improved food security ([Iduseri et al., 2022](#); [Scheyvens and Laeis, 2022](#)). [Ambelu et al. \(2018\)](#), [Lee et al. \(2019\)](#) highlighted the importance of exploring tourism and food security ([Ambelu et al., 2018](#); [Lee et al., 2019](#)). However, this study applies the sustainable livelihood framework to contribute to the advancement of knowledge in this field.

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## Conclusion

Although food security is a pressing global issue, it is often overlooked in the context of tourism-related development policies and plans. The findings of this study highlight the failure of existing initiatives to recognize the potential impact of the tourism sector on food security. From the very beginning, this research aimed to understand the connection between tourism and food security, recognizing its importance in identifying sustainable tourism practices that can contribute to addressing the immense global challenge of food insecurity, as outlined in SDG2.

To effectively address food security concerns within the context of sustainable tourism, it is crucial to implement interventions guided by appropriate policies and supported by effective policy instruments. For instance, the tourism sector should consider explicitly recognizing food security as a distinct goal, which was not emphasized in this study despite the significant levels of food issues observed in the case study. By prioritizing such policy initiatives, tourism can contribute to improving food security outcomes for destinations that depend on well-nourished and adequately fed communities.

The current body of research on tourism tends to neglect the important impact of tourism jobs and income on maintaining reliable food security. However, this study brings attention to the relationship between tourism employment and its influence on both the consumption and stability of food resources. By uncovering this connection, the study contributes to a deeper understanding of how tourism activities can affect the availability and sustainability of food for individuals and communities.

Furthermore, our study prompts us to extend our gaze beyond Siwa Oasis and contemplate the broader implications of our findings for other desert-prone regions in Sub-Saharan Africa. While each region has its unique dynamics, there are overarching lessons to be drawn from our research. The study advocates for further studies and collaborative efforts that delve into the specific challenges and opportunities of desert-prone areas, ultimately aiming to develop context-specific strategies that can bolster food security in these vulnerable regions.

In closing, the study underscores the imperative of recognizing food security as an integral component of sustainable tourism development. It is only by weaving this vital thread into the fabric of tourism policies and practices that we can hope to achieve lasting improvements in the food security landscape, not only in Siwa Oasis but also in analogous settings across Sub-Saharan Africa and beyond.

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