UNIVERSITY OF MARYLAND EASTERN SHORE
UMES EXTENSION

MARYLAND AGRITOURISM: A BASELINE PROFILE 2023

By K.U. Ejiogu, E.N. Escobar and M. Kairo

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This white paper by the University of Maryland Eastern Shore (UMES) Extension frames the baseline of agritourism services in Maryland.

Agritourism is a consumer-focused agricultural operation. It is structured as an additional income-generating platform to augment the economic viability of a farm. Agritourism typically involves participation in a farm activity or operation, leisure, education, and active involvement. Agritourism centers in Maryland include wineries, creameries, craft breweries, petting zoos, U-pick, horseback riding, corn mazes, hayrides, farm festivals, and other activities. The economic, social, and cultural activities involved in agritourism offer significant opportunities and implications for rural America. The Maryland General Assembly passed House Bill 252 (March 19, 2018) to provide a framework for the characterization of agritourism in the state. The bill provides a model definition of agritourism as an activity conducted on a farm offered to the general public or guests for education, recreation, or active involvement in farm operations. Local county authorities have adopted the model in their land use management laws and regulations.

Small- and medium-sized farmers in the state of Maryland are increasingly dependent on agritourism as a source of additional income to maintain their farm holdings. Over the years, this has resulted in a decrease in farmland size, impacting the farms' productivity and profitability. About 54.4% of U.S. agricultural producers in 1987 considered farming/ranching their primary business, compared to 45.1 in 2007. Income from farm operations has declined from 41.6% between 1960 and 1969 to 10.8% between 2000 and 2009.

This publication provides baseline information and guidance to UMES Extension specialists and educators offering formal education and training to agritourism farmers. Many farmers cannot solely decide, incorporate, and effectively manage farm recreational activities alongside their core farm production routine. The goal is to assist agritourism entrepreneurs in maximizing their social and economic capacities and thus contribute to local community welfare and development in counties within the state. The publication provides an overview of the typology and spatial distribution of agritourism services within the 24 counties in the state of Maryland. It evaluates the cost of access to transportation and explores the consumer characteristics of agritourism locations.

The study collected data for 485 agritourism facilities through an internet search and direct inquiries. This process involved corroboration with academic publications, direct source information, federal and state government sources, private organizations, non-governmental organizations (NGOs), and United States Department of Agriculture (USDA) databases. The descriptive methods adopted in the study involved spatial mapping and distance analysis.

At the center of the state of Maryland county map is a primary agritourism hotspot location. The density surface map reveals that Howard County is host to a primary hotspot transect of agritourism services. At the border of the counties of Howard and Anne Arundel lies a spatial cluster of agritourism services. The map designates Montgomery, Frederick, Baltimore, and Prince Georges counties as secondary hotspot hosts. Cold spots are more conspicuous in the upper and lower eastern shore counties.

Approximately 28% of Maryland agritourism services are farm markets. Craft breweries followed with 18%, and wineries comprised 15% of the services. Creameries covered 6.8% of the services, and agricultural heritage festivals covered 6.2%. In the middle of the distribution were apiaries at 5.5%, farm stores at 3%, U-picks at 2.7%, corn mazes at 2.2%, pumpkin patches at 2%, and hayrides at 1.6%. On the lower end of the distribution are petting zoos, farm camps, and alpaca farms, comprising the lowest number of services at 0.4% each.

The degree of variation between population density and the number of agritourism operations in Maryland counties is extremely low. Similarly, the distribution of median income per county does not compare with the count of agritourism services. Also, a county's natural index ranking does not quite approximate its number of agritourism facilities. On average, visitors will travel less than 32 miles between a city of more than 10,000 people and an agritourism facility within the same county. Generally, the origin to destination cost matrix results revealed that the average distance of agritourism sites to US and state highway junctions in the state ranged between 14 and 76 miles. US 40, US 301, and US13 allowed greater access to the agritourism sites than the other major highways. Generally, intermittent increases and declines in agritourism incomes in counties across Maryland were reported from 2012 to 2017. However, in Montgomery and Frederick counties in the north-central region, agritourism earnings have been steadily increasing.

The findings in this report stress the need for educational support for agritourism management and development. The support system can potentially leverage the advantages inherent in the widespread diversification to agritourism among small- and medium-income farm enterprises. Extension education provides an effective platform to enhance the progress and sustainability of agritourism businesses in the state of Maryland. This report will be succeeded by a survey. The survey will identify the requirements of agritourism stakeholders, including consumers, operators, extension services, and program managers, to test farm, and farmer, assumptions, especially assumptions about the place-based characteristics so far gleaned from this baseline assessment.

FIGURES

TABLES

INTRODUCTION

The purpose of this study is to provide a baseline profile of agritourism in Maryland. It is a pre-assessment of the typology and spatial distribution of agritourism services in the state for extension services development purposes (Altschuld & Kumar, 2010; Angima et al., 2014; Caravella, 2006). Interest in agritourism research is increasing in momentum in the United States, and a range of opinions have emerged on the significance of agritourism for the socio-economic development of the country's rural and agricultural regions.

Maryland is primarily an agricultural state. Approximately 32% (about 2 million acres) of all land in the state was under agricultural use in 2019. In this position, agriculture is the single largest sectoral land use industry in the state. The majority of Maryland farmlands are located in the upper eastern shore and the state's north-central regions (Maryland Manual Online, 2020). Agritourism in Maryland represents a diversification, extension, and merger of farm-based economies with tourism. Tourism makes up about 6.1% of direct and indirect employment in Maryland (Tourism Economics, 2018). A merger of recreational farm economies and the actual farm production economy potentially increases agriculture's slice of the state's yearly income generation capacity.

Defining Agritourism

A principal task encountered in reviewing the literature on agritourism, for this report, is assembling its definition and typology – since similar practices and services, we found, receive diverse designations depending on location, history, understanding, interest, goal, and who is naming (Barbieri & Mshenga, 2008; Marques, 2006; Philip et al., 2010; Roman & Golnik, 2019).

The working farm concept is a recurring theme in definitions of agritourism in the literature (Philip et al., 2010). Marques (2006, p. 151) described agritourism as "specific type of rural tourism in which the hosting house must be integrated into an agricultural estate, inhabited by the proprietor, allowing visitors to take part in agricultural or complementary activities on the property." McGehee describes it in simpler terms, as "rural enterprises which incorporate both a working farm environment and a commercial tourism component" (2007, p. 111). According to Barbieri and Mshenga, agritourism is "any practice developed on a working farm to attract visitors" (2008, p. 168). Agritourism typically involves the visit of tourists to a location of agricultural activity and some type of leisure, education, or active participation in those activities or operations. It provides tourists the opportunity to buy fresh produce, fish, meat, or vegetables and enjoy uncommon farm-related leisure (Roman & Golnik, 2019).

Objectives

The study explored the requirement for agritourism education support by the University of Maryland Eastern Shore's UMES extension specialists and educators. This objective contextualizes the development of educational and agricultural extension services for policy, management, development, and evaluation purposes. The study supports agritourism rural development goals such as developing cooperation and collaborative support systems among agritourism providers in the state. In summary, the study explores Maryland's agritourism questions regarding the following:

1. The typology of agritourism activities relevant to the state of Maryland.
2. The spatial spread of the facilities, stakeholder locations, and types of recreational farm services provided.
3. Public access to transportation infrastructure, and the proximity of facilities to population centers.
4. The implications of median income, natural amenities, and population density for the locations of facilities.
5. Regional and county distributions and their influence on agritourism earnings.

Goal

The report provides information and guidance to the UMES extension services unit to offer formal education and training to farmers. Bagi and Reeder (2012) attest that education can help farmers decide on, engage in, and manage agritourism. The study will be useful to policymakers who need to manage limited resources to develop and advance agritourism policies and programs for education, marketing, advertising, and promotions. Bagi and Reeder underlined the importance of understanding the state of public access and location to aid experts, such as educators and public policymakers, in streamlining policies and programs seeking to promote agritourism. Such understanding would also assist farmers with information about their farms' potential for agritourism. Extension agencies serve small

farm holdings, family farms, older farmers, underserved communities, minorities, and limited resource farmers. Many farmers cannot solely decide, incorporate, and effectively manage farm recreational activities alongside their core farm production routine. The goal is to assist agritourism entrepreneurs in maximizing their social and economic capacities and in contributing to the welfare and development of local communities in counties within the state (Figure 1).

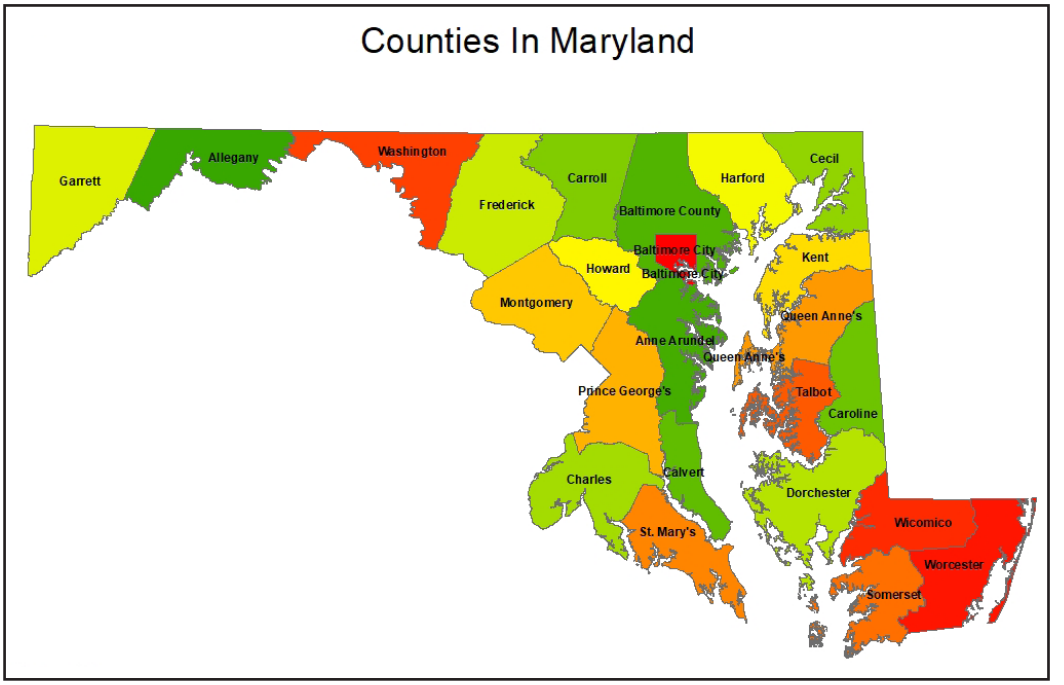


Figure 1. Map Showing the 24 Counties in the State of Maryland. Data Source: State of Maryland

The report provides an overview of the typology and spatial distribution of agritourism services within the 24 counties that make up Maryland. It identifies the role of access to transportation in the location of the services and reveals how educational institutions can respond to the needs of the agritourism industry in the region through exploration of the consumer characteristics of agritourism locations.

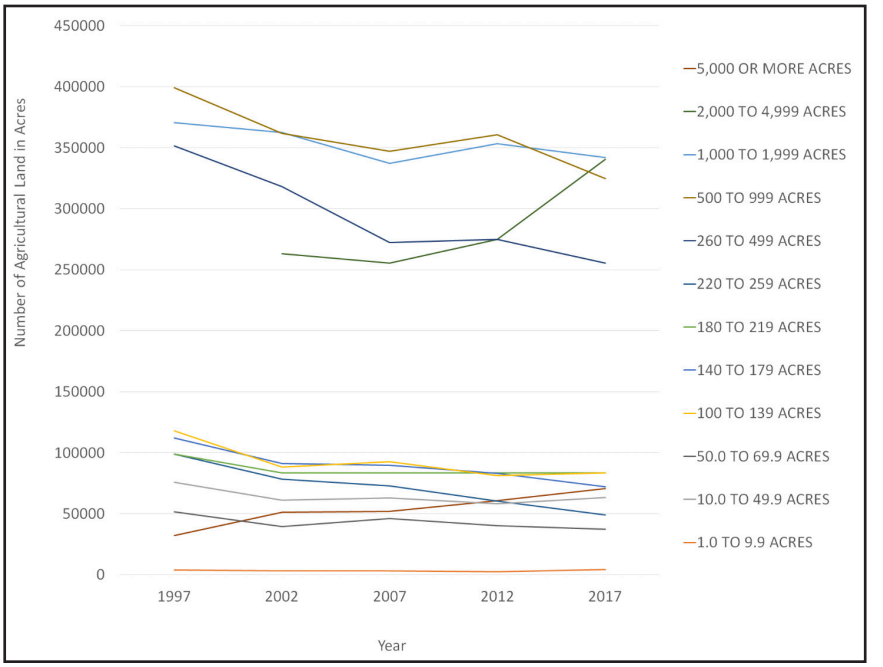


Figure 2. Chart Showing Farm Size Distribution in Maryland, 1997–2017. Data Source: USDA

Why Agritourism

Farmers venture into agritourism to augment farm income, make full use of assets and available resources, maintain agricultural farm heritage and land holding, and provide additional employment opportunities (Amanor-Boadu, 2013; Ammirato & Felicetti, 2013; Bernardo et al., 2004; Harris, 2014). Rural areas need such investments to encourage rural development, enhance rural businesses' earnings, and diversify local communities (Lucha et al., 2019). Small- and medium-sized farm operators in Maryland are increasingly dependent on agritourism as a source of additional income to maintain their farm holdings (Harris, 2014). Many small- and

	Small and Medium Farms							Large Farms	
1997-2017	10.0 TO 49.9 ACRES	50.0 TO 69.9 ACRES	100 TO 139 ACRES	140 TO 179 ACRES	180 TO 219 ACRES	220 TO 259 ACRES	50.0 TO 69.9 ACRES	2,000 TO 4,999 ACRES	5,000 OR MORE ACRES
Change (No of Farms)	-12422	-14333	-34362	-40140	-15316	-49576	-14333	77667	38716
%Change	-16.43%	-27.85%	-29.14%	-35.79%	-15.52%	-50.22%	-27.85%	29.53%	121.28%

Table 1. Average Percentage Change in Farm Size (Acres) in Maryland

medium-scale farms are unable to meet farm management's modern demands in cost, technology, labor, and efficiency. Over the years, this has resulted in a decrease in farmland size, impacting farms' productivity and lucrativeness (Harris, 2014). According to NASS/USDA (2010, cited in Amanor-Boadu, 2013), about 54.4% of United States agricultural producers in 1987 considered farming/ranching as their primary business, compared to 45.1% in 2007. Income from farm operations has declined from 41.6% (between 1960 and 1969) to 10.8% (between 2000 and 2009; Economic Research Service/USDA, 2011, cited in Amanor-Boadu, 2013).

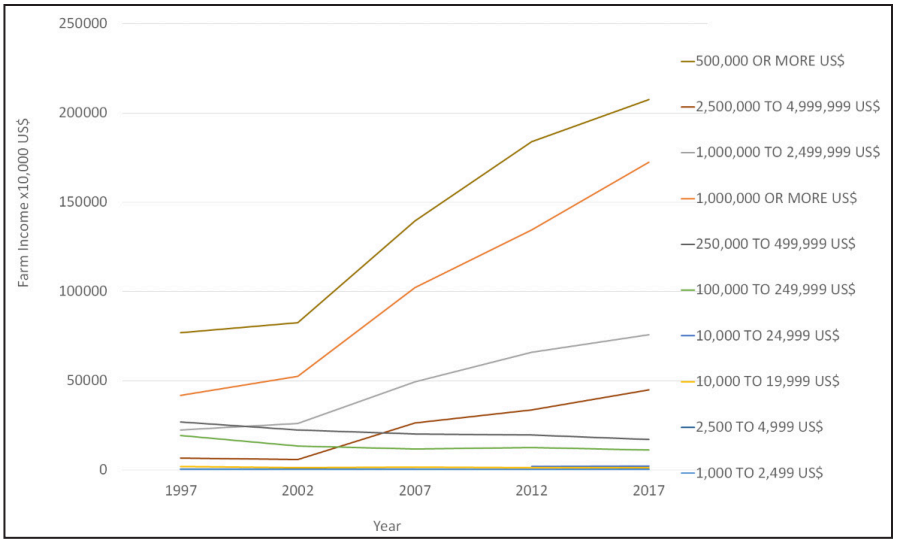


Figure 3. Chart Showing Farm Income Distribution in Maryland, 1997–2017. Data Source: USDA

Figure 2 and Table 1 show the change in acres of farm sizes among small, medium, and large farmland classes in Maryland over 20 years. The number of agricultural land acres consistently declined for small- and medium-scale farms from 1997 to 2017. For instance, while the number of large-scale farms (5,000 acres or more, and 2,000 to 4,999 acres) increased (by 120% and 30%, respectively), the number of small- and medium-sized farms (10.0 to 49.9 acres, 50.0 to 69.9 acres, 100 to 139 acres, 140 to 179 acres, and 180 to 219 acres) decreased by an average of 25%. The same pattern is seen from income generation in core productive farm activities, which have declined over the past two decades. Figure 3 and Table 2 describe farms in terms of income levels. Small- and medium-sized farms of different income classes ($1,000 to $2,499, $2,500 to $4,999, $10,000 to $19,999, $50,000 to $99,999, $100,000 to $249,999) averaged an income decline of about 28% between 1997 and 2017. By comparison, large farms represented by much larger income earnings ($500,000 or more, $1,000,000 or more, $1,000,000 to $2,499,999, and $2,500,000 to $4,999,999) witnessed a steep rise of 325% on average.

Need for the Assessment

The state of Maryland currently lacks a concise, real-time compendium of its agritourism assets and their locations, services, consumer base, infrastructure, education, research, and developmental requirements, as agritourism policy is yet unfolding in the state. However, the University of Maryland's Agricultural Law Education Initiative (ALEI) has examined diverse legal issues involved in the establishment and management of agritourism, such as limiting liabilities and the legal challenges involved in the farm-to-table direct marketing of produce (Ellixson & Taboor, 2016; Suri, 2015, 2016). The present report primarily assembled information to explain agritourism typology, locations, and services in the state.

In a geographic analysis of agritourism in Virginia, Lucha et al. (2019) examined the consumer-related factors that determined the location and economic viability of agritourism. These factors included population density, metropolitan areas, interstates, median household income, population growth, and natural amenities. On a more generic level, Sloagett and Woods (2003) underlined labor, raw materials, transportation, consumer markets, utilities, industrial sites, and financial capital as

	Small and Medium Farms						Large Farms		
1997–2017	1,000 TO 2,499 US$	2,500 TO 4,999 US$	10,000 TO 19,999 US$	50,000 TO 99,999 US$	100,000 TO 249,999 US$	500,000 OR MORE US$	1,000,000 OR MORE US$	1,000,000 TO 2,499,999 US$	2,500,000 TO 4,999,999 US$
Change (×10,000$)	-63.2	-109.8	-587.1	-1315.6	8117.1	130621.1	130427.8	53235.4	38268.9
% Change	-24.54%	-20.32%	-30.15%	-22.29%	-41.80%	169.68%	311.00%	237.44%	580.71%

Table 2. Average Percentage Change in Farm Income

critical factors in Oklahoma's industrial locations. Based on survey data from 20,579 farms in the United States, Brown and Reeder (2007) examined the factors that influenced the ability to run farm recreation businesses. These factors included the farm operator's net worth, the facility's distance from cities of at least 10,000 people, the presence of natural amenities (water, climate, and topography), and the number of hours operators spend away from the farm, especially during the summer.

The present study's purpose extends beyond identifying the location and types of services offered by agritourism operators. The study also gathers baseline information on other factors crucial for appraising an area's potential as a lucrative consumer base for agritourism operations.

CHALLENGES

Agritourism lacks shared understanding and a clear, uniform definition (Philip et al., 2010), creating confusion for consumers and limiting collaboration among stakeholders. A good definition of agritourism should include mentions of the agricultural setting, farm, entertainment, and education. It should also identify whether the agricultural setting's activity is staged or authentic (Arroyo et al., 2013).

In the United States, the State of Texas contains 23% of the farms that make revenue from agritourism. The agritourism and farm recreation industry in Maryland is worth about $9.8 million annually (Hogan, 2019). Between 2002 and 2007, there was about 90% growth in the number of farms in the United States that made at least $25,000 annually from agritourism (NASS/USDA, 2007, p. 639).

Over the years, the legal framework and policies for managing agritourism in the United States have been inconsistent (Arroyo et al., 2013). The lack of a uniform definition is a significant challenge for the development of agritourism because 1) it impacts the ability of institutions of governance to create policies for the development of agritourism; 2) it hinders marketing strategies and the capability of stakeholders to market their various services to consumers; 3) it hinders academic collaboration, uniformity of the field, and contributions to specialized research in agritourism and its related services; and 4) it negatively impacts agricultural facility authenticity and the experience offered (Arroyo et al., 2013). Additionally, access to the transportation network, the provision of durable road signs, labor (including seasonal), information training, marketing, and networking opportunities are significant challenges to agritourism development.

On the other hand, Schilling et al. (2006) observed that agritourism operations also present significant concerns for operators and local communities. These concerns include the loss of privacy, the issues of liability related to opening farmlands to the public for recreational purposes, and the over-emphasis on amusement, which overwhelms agriculture's real purposes, leading to lower productivity for operators. These are concerns about the impact of agritourism, such as over-hunting and hiking, on wildlife and the natural environment. The presence of agritourism services may overwhelm local communities' way of life by straining local services, monetizing free services such as parks, and fishing on private lands that were before then enjoyed by the local communities. In addition, Bagi and Reader (2012) observed that nonresident agritourists might tend to encroach on private lands searching for thrills.

These challenges increase the need for relevant research on agritourism development and programs, as well as policies for extension services in educational institutions and related bodies across the state.

TYPOLOGY AND SPATIAL DISTRIBUTION

Typology

The typology chosen to describe agritourism services and businesses in the present study closely follows Philip et al.'s (2010) descriptions founded on concepts of the working farm, the nature of activity and engagement on the farm, as well as the authenticity of the tourist experience, as the three-dimensional boundaries for agritourism. A working farm describes a location where agriculture is currently practiced, assuming that crop growing or animal rearing activities occur at such locations. The second concept – the nature of the activity or engagement – should also be related to agricultural practices. In this case, the engagement of the tourist with agriculture at the working farm may be direct (such as milking a cow, picking vegetables), where tourists make contact with the normal day-to-day agricultural setting (Philip et al., 2010). Tourists may also contribute labor for accommodation and meals in the direct engagement approach, providing a win-win situation for the tourist seeking the thrill of a real farm setting and the agritourism business, which may be seeking cheap labor, especially seasonally. This type of operation is often viable in labor-intensive organic farms (McIntosh & Bonnemann, 2006). With indirect activities, agricultural commodities (more than the agricultural activities and practices) feature more prominently in

the touristic experience (e.g., walking through a corn maze, buying and consuming prepared meals). In passive engagement agritourism, there is a formal separation between tourism and agricultural operations within the same location – for instance, engaging in outdoor activities such as horse riding (Philip et al., 2010). Finally, adopting MacCannell's (1973) concept of "authentic experience," an authentic agritourism experience depends on whether a tourist is provided the backstage experience or front-end experience of the agricultural practice (Philip et al., 2010). Staged agricultural events, according to Philip et al. (2010), do not provide a true agritourism experience; however, practices such as farm tours where tourists are taken through both the back- and front-end practices of the working farm would serve as authentic agritourism experiences. In precise terms, these variants of agritourism are combined and developed as follows: a) working farm indirect contact agritourism; b) working farm direct contact staged agritourism; c) working farm passive contact agritourism; and d) working farm direct contact authentic agritourism (Philips et al., 2010). All these variants of agritourism are represented in the list of agritourism services in the State of Maryland described in this report.

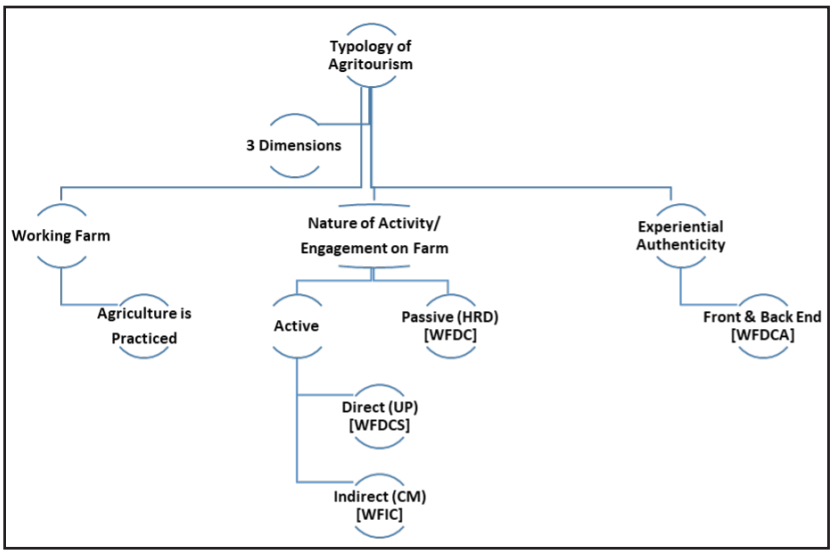


Figure 4. Sketch of Agritourism Typology Adapted from the Description in (Philips et al., 2010) [Terms: working farm indirect contact agritourism (WFIC); working farm direct contact staged agritourism (WFDCS); working farm passive contact agritourism (WFPC); working farm direct contact authentic agritourism (WFDCA)] (Philips et al., 2010)

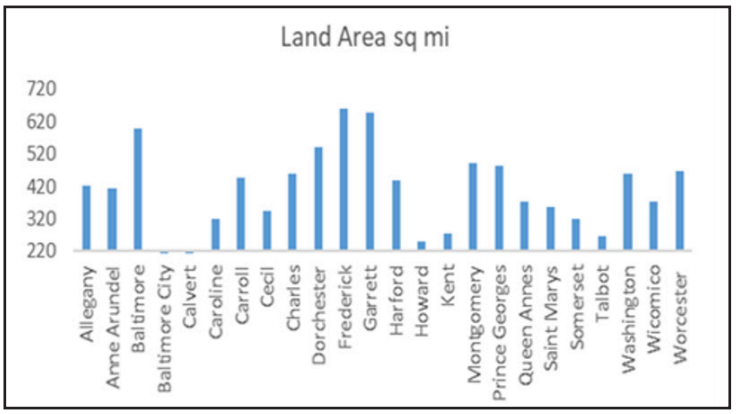
Pre-Assessment Adapted Typology

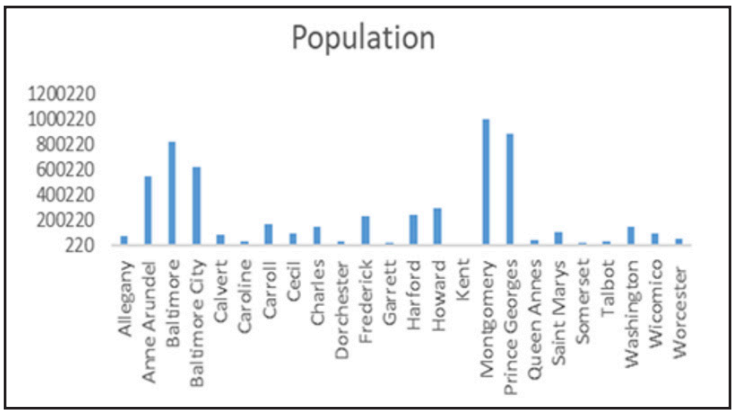
In the present report, we include and designate a variety of individual agritourism events because of the unique and variegated nature of the State of Maryland's environment, agricultural industry, and practices (Dill et al., 2017). Invariably, agritourism does not yet share a common typology of its different facets, as a kind of assessment paradigm. For instance, agricultural festivals such as the pumpkin festival, as an agritourism experience, engages and provides more of the aesthetic appeal of the farm location's uniqueness and tradition for the tourist's sense of wonder, newness, culture, tradition, and enjoyment. Therefore, the third concept – the authenticity of the tourism experience – includes agricultural festivals that are unique to certain locations, mostly rural working farm types across Maryland. These activities can also be co-located and may be identified by the most prominent or preferred tourism activity. Butts et al. (2005) suggest that indirect activities, such as providing accommodations and farm-fresh restaurants or walking through a corn maze, serve as complements of agricultural activities and are indeed true components of agritourism. It is important to note that the types of agritourism businesses identified in this study (see Glossary – Appendix B – List of Agritourism Services) are found in Philip et al.'s (2010) three agritourism dimensions. We do not assume that an indirect or passive engagement or a front-end experience in any way detracts from achieving the goals of tourism within agritourism. These functions and experiences would depend on innumerable factors of personal goals and needs far beyond the scope of the present baseline assessment study or, indeed, that of Philip et al. (2010).

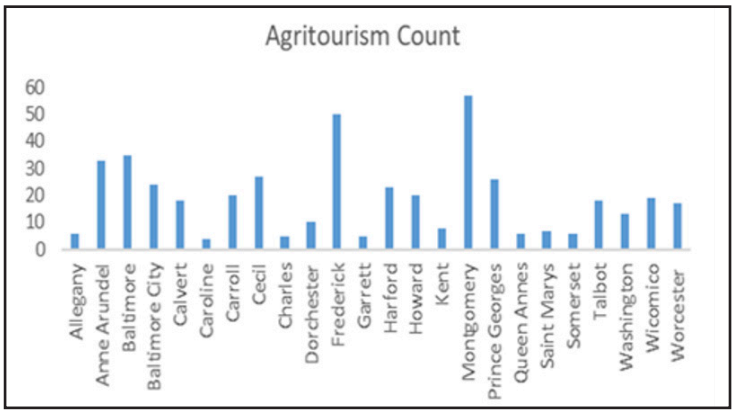
For the most part, an authentic experience is most likely a matter of individual perception and cognition. There is no doubt that, to provide the touristic experience in a working farm, some accommodations ought to be made for the expectant tourist. These could include seasonal festivities as well as attractive arrangements such as petting zoos for the young and young at heart. Perhaps a broad-based agritourism typology should allot fewer exceptions to indirect or passive engagement and authenticity of experience. Based on Philip et al.'s (2010) descriptions of agritourism, Figure 4 represents the typology adapted for this study and upon which the agritourism sites were selected.

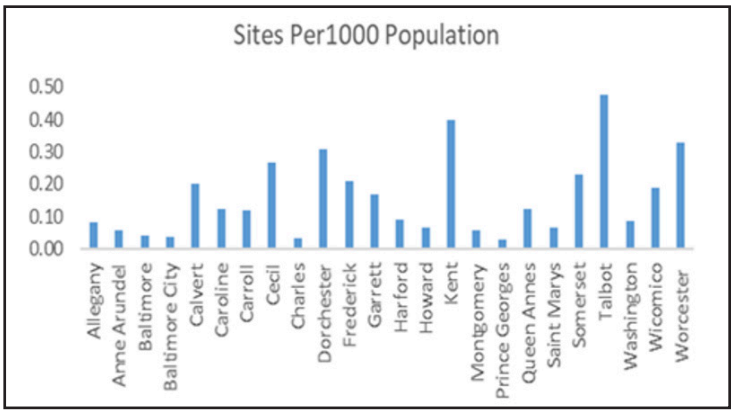
Spatial Distribution

Increased urbanization and changing land use pattern have tremendously reduced the size of agricultural land in Maryland (Nickerson et al., 2001), raising the need for efficient and sustainable utilization of available agricultural land. The present study assessed the position









of counties in terms of land area, agritourism facility count, and population distribution.

The distribution of population and land area (Figure 5) differs among counties in the state. Compared against the number of agritourism sites located in each county, overall, Talbot County has the highest proportion (0.48) of agritourism sites per 1,000 population. Kent County, with approximately half the population of Talbot, followed next, with 0.4 agritourism sites per 1,000 population, though it ranked 21st in land area. Talbot, however, ranked 8th when examined according to the number of sites per 100 square miles of county land area (6.7). Baltimore City recorded the highest proportion of sites (29.65) per 100 square miles, followed by Montgomery (11.60). Garret County recorded the lowest number of agritourism sites per 100 square miles (0.77), which was about 38% less than Baltimore City. Garret, however, recorded the 10th highest number of sites per 1,000 population (0.17); Prince Georges County recorded the lowest (0.03). Population size, land area, land use policies, and value are important economic indicators that require significant consideration in the promotion of the agritourism industry.

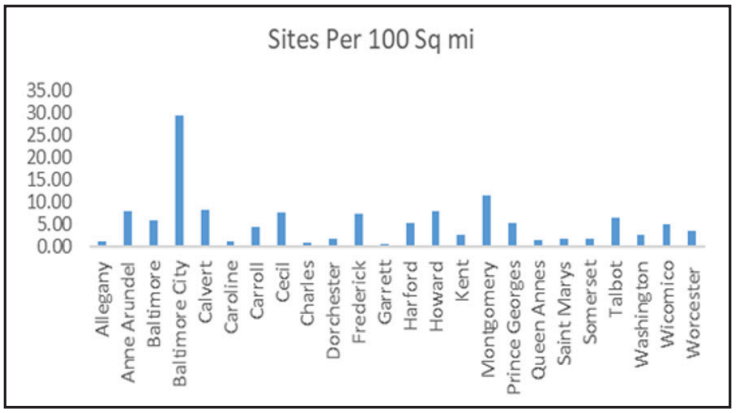


Figure 5. County Land Area, Population, and Agritourism Count in Maryland. Data Source: Maryland Geological Survey; US Census Bureau; UMES Extension.

WHAT CONSTITUTES AGRITOURISM OPERATIONS IN MARYLAND

Bernardo et al. (2004) observed that agritourism in the United States is more prevalent in the northeast and on the west coast and has, for decades, lagged behind agritourism in Asia and Europe. In the United Kingdom, about one-third of all farms incorporate some form of agritourism. Bernardo et al. describe agritourism in terms of a multi-functionality of agricultural, social, and economic goals. In a sense, it is an agricultural approach that extends beyond traditional agricultural practices to include rural development and viability, preservation of

cultural heritage, land conservation and maintenance of agricultural landscapes, and agri-biological preservation and diversity (Bernardo et al., 2004).

In 2018, both chambers of the Maryland General Assembly passed House Bill 252 to provide a framework for the characterization of agritourism in the state. The bill provides a model definition of "agritourism" as an activity conducted on a farm that is offered to a member of the general public or invited guests for education, recreation, or active involvement in the farm operation. Local county authorities have adopted the model in their land use management laws and regulations (Department of Agriculture, 2018). House Bill 252 by the Department of Legislative Services of the Maryland General Assembly lists the range of services regarded as agritourism. These services include farm tours, hayrides, corn mazes, seasonal petting farms, farm museums, guest farms, pumpkin patches, "pick your own," or "cut your own" produce. Others are classes related to agricultural products or skills, and picnic and party facilities offered in conjunction with any agritourism activity. The policy notes that this bill is essential since the definition of agritourism could determine its regulation.

Bernardo et al.'s (2004) agritourism functionalities are applicable to agritourism in the State of Maryland. Active agritourism centers in the state include wineries, creameries, craft breweries, and petting zoos and involve the retail of fresh produce, horseback riding, hayrides, and other activities mentioned in the Maryland legislative policy. Indeed, the economic, social, and cultural activities involved in agritourism entail significant opportunities and implications for rural America (Harris, 2014). As revealed in Figures 2–3, the economics of agriculture scales in Maryland favor large-scale farm operators. This situation leaves family-owned medium-scale and small farms struggling to maintain their landholdings. In the nearby state of Virginia, public interaction sustains medium-scale farms. Medium-scale farms in Virginia have adopted agritourism as a new approach to sustain their agricultural operations (Harris, 2014).

Rural Development

Agritourism operations contribute to revitalizing rural communities by augmenting the income capacity of traditional forms of agricultural practices, thus adding vitality to communities (Ammirato & Felicett, 2013). Agritourism is essentially an instrument of regional development based on local specificities and natural landscapes (Helena, 2006).

Income Generation

As global tourism grows annually (Carpio & Wohlgenant, 2008; Roman & Golnik, 2019), tourist spending generates billions of dollars every year in Maryland. In 2016, about 42 million tourists within and outside the state had travel expenses of about $17.3 billion, providing $2.35 billion as taxes paid to the state and local governments and supporting about 145,000 workers on a tourism industry-related payroll of about $6 billion. The income generated through travel expenses by tourists in 2016 was 2.7% higher than in 2015. Similarly, the payroll supported by tourism increased by 5.2% in 2016 compared to 2015 (Tourism Economics, 2016).

We acknowledge that agritourism can strengthen the economic base of farms by creating alternative sources of sustainable income. However, the state of Maryland lacks the comprehensive policy information necessary to sustain such mixed-used farming systems in agricultural communities.

GEOGRAPHY OF MARYLAND AGRITOURISM

The list of stakeholders, addresses, and the services offered by the agritourism businesses was developed via an internet search, personal investigation, U.S. directories of agritourism services, and stakeholder websites. The process involved corroboration by academic publications, direct source information, U.S. and state government sources, private organizations, non-governmental organizations (NGOs), and United States Department of Agriculture (USDA) databases. The descriptive methods adopted in the study involved spatial mapping and distance analysis.

Bernardo et al. (2004) noted that the principal reasons for visiting agritourism facilities include enjoying the scenery, visiting family and friends, participating in farm activities, and making purchases. Considering this factor in designating agritourism events as primary, secondary, and tertiary activities, we selected the most common type of agritourism service at each location as its primary service.

The business addresses and individual services offered by the agritourism facilities were spatially geocoded to the state of Maryland map using ArcGIS 10.5 ESRI Redlands California mapping software. The services offered by the business were coded and mapped as primary, secondary, and tertiary services (Figures 3–5, 8-10). The codes differentiate closely related services. Altogether,

38 different services and events were coded. Agritourism-based operations and services in Maryland include farm markets, creameries, wineries, craft breweries, apiaries, festivals, U-pick, corn mazes, hayrides, pumpkin patches, and teaching farms, among others. The full list of 38 services is listed and coded in short form in the glossary in Appendix B. For instance, 'FM' represents a farm market – a place where a variety of vendors from working farms sell their produce. This differs from 'FS' (farm store/stand), which represents a produce selling location for a single vendor – often located within the premises of the vendor's working farm – and 'CR' refers to a creamery. The number of primary businesses differed from the total count of agritourism services offered by facilities. Approximately 45% of the entities offered more than one agritourism service. The hierarchy of services offered at an agritourism location determines its appeal to tourists and its impact in sustaining the business. For instance, for a craft brewery, the brewery is recorded as a primary service; if the center owned a restaurant or bar (based on the brewery products), this is recorded as a secondary service. The study identified 485 locations of agritourism operations in the state (see Appendix A), with an average of 19 locations per county and a standard deviation of 13.7. The locations are geocoded to spatial maps linking the types of agritourism services offered to each location. Figure 6a describes the distribution of agritourism facilities locations across counties in Maryland. Figure 6b is a choropleth map of Maryland counties showing the distribution of primary agritourism locations. Most of these facilities are located in the north-central and southern regions of Maryland. While, at face value, the spread of the locations of agritourism operations appears to be even, Figure 7a, a density surface map, and Figure 7b, a cluster analysis of the same data sets, show concentrations of facilities within counties in the north-central and southern regions of Maryland. The highest concentrations of farm-related agritourism facilities are situated in Montgomery and Frederick counties (38–57), followed by Prince Georges, Anne Arundel, Baltimore, and Carol counties (24–37). Remarkably, these counties also host several large cities. Garret, Charles, Kent, St. Mary's, and Queen Anne's had the fewest agritourism locations (5–8).

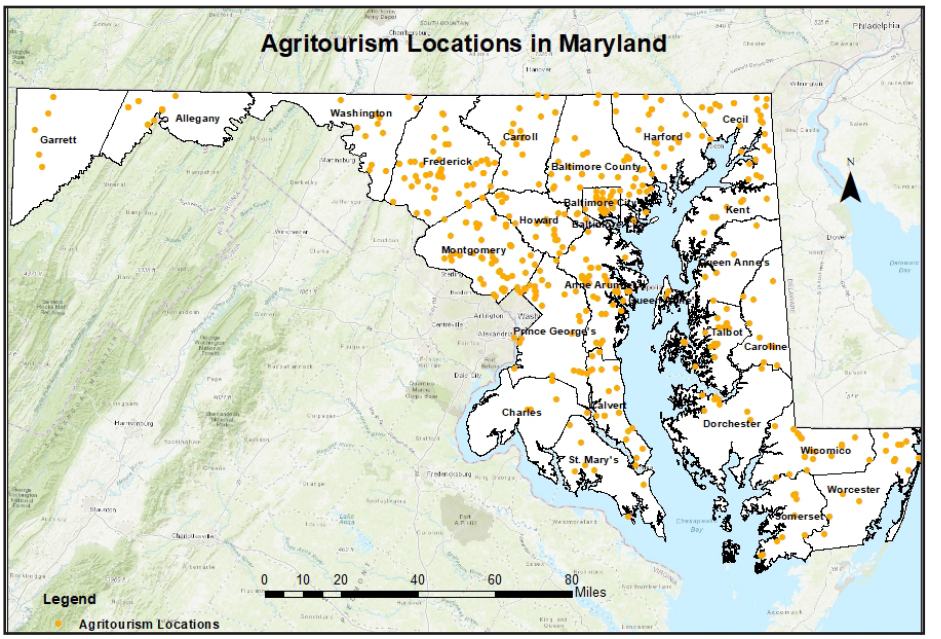


Figure 6a. Map Showing the Spatial Distribution of Agritourism Locations in Maryland

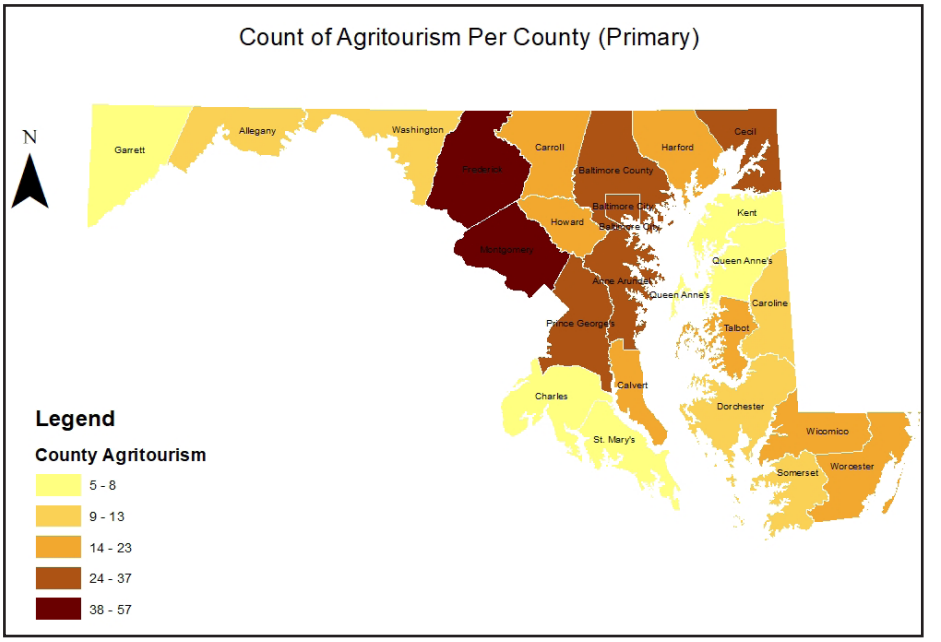


Figure 6b. Map Showing the Concentration of Agritourism Locations Per County in Maryland. Data Source: Agritourism Baseline 2018

Clusters

We mapped the spatial clusters or hotspots of agritourism services by using density surface (Figure 7a) and standard cluster (Figure 7b) techniques. These clusters or hotspots designate areas with a high concentration of agritourism farms. Cold spots are areas with low concentrations of agritourism locations. As

seen in Figures 7a and 7b, at the center of the state of Maryland county map is a primary agritourism hotspot location. Here, we refer to a hotspot as an area where agritourism operations locations are very close to each other. It does not indicate that the host county comprises more locations than the other counties. Figure 6b describes the count of agritourism locations per county. The density surface map reveals that Howard County is host to a primary hotspot transect of agritourism services. At the border of Howard County, Anne Arundel County also hosts an area of primary agritourism activities. The area between Howard County and Anne Arundel County agritourism reveals a spatial agglomeration of agritourism services. The map designates Montgomery, Frederick, Baltimore, and Prince Georges counties as secondary hotspot hosts. In other words, the clusters in the secondary host counties were more broadly spread. The upper and lower eastern shore counties had cold spots. The Figure 7b cluster map provides fewer specific results, but it equally designates Frederick, Howard, Montgomery, Anne Arundel, and Baltimore as the primary hotspot counties.

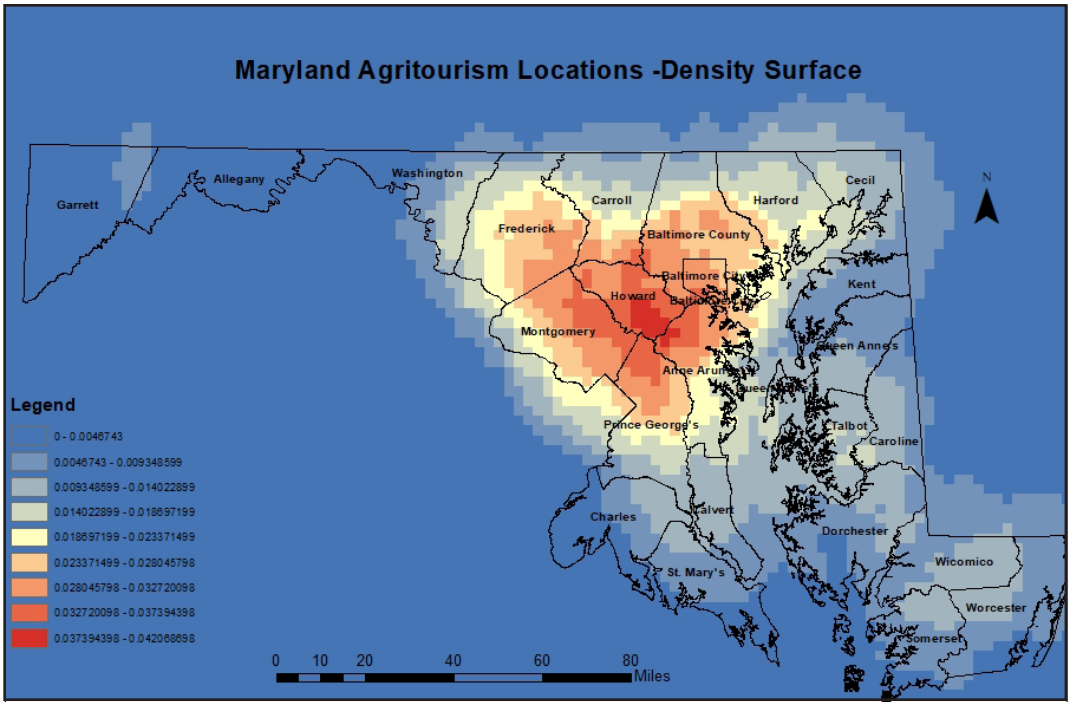


Figure 7a. Map Showing a Density Surface of Agritourism Locations Within Counties in Maryland

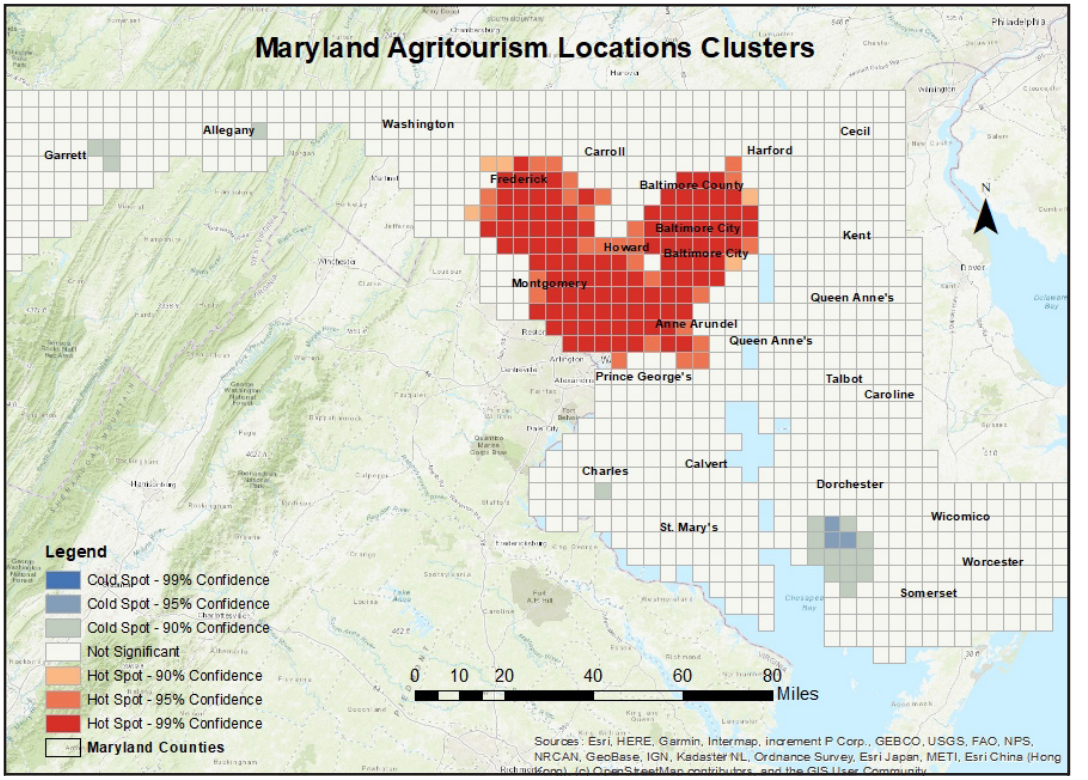


Figure 7b. Map Showing a Cluster Analysis of Agritourism Locations Within Counties in Maryland

Primary Services

Figure 8, a Pareto chart of primary agritourism operations, describes, in descending order of concentration, the distribution of the collective primary agritourism services in Maryland. The chart shows that 28% of the state's agritourism services are farm markets. Craft breweries followed with 18%, and wineries comprised 15% of the services. Subsequently, creameries covered 6.8% of the services, and agricultural heritage festivals 6.2%. In the middle of the distribution were apiaries (5.5%), farm stores (3%), pick-your-owns (2.7%), corn mazes (2.2%), pumpkin patches (2%), and hayrides (1.6%). On the lower end of the distribution were petting zoos, farm camps, and alpaca farms,

comprising the smallest number of services at 0.4% each. The following choropleth maps describe counties where these agritourism facilities are more widespread as primary services.

Farm Markets

As evident in the individual maps (Figures 9–20), the spatial distribution of agritourism services in Maryland is variegated, indicating that certain services concentrate in particular counties. The farm markets spread (Figure 9) mirrored the collective distribution of all agritourism services across the counties. This is because of the large percentage of farm market agritourism (28%). Without a doubt, farm markets are the most conspicuous agritourism operations in Maryland. Most large farms incorporate farm markets as part of their marketing strategies and for the direct sale of products to consumers. Small farms often incorporate a farm store or a roadside farm stand. The farm market clusters replicated the density surface and cluster analysis map in Figures 7a and 7b. Comparing Figure 6b (agritourism count per county) and Figure 9 (farm market operations per county), Montgomery County in the north-central region recorded the most extensive farm market operations. Prince Georges, Anne Arundel, and Baltimore counties host many farmers' markets. The western, lower, and upper eastern shore counties recorded a lower count of farmers markets – except Howard and Wicomico counties.

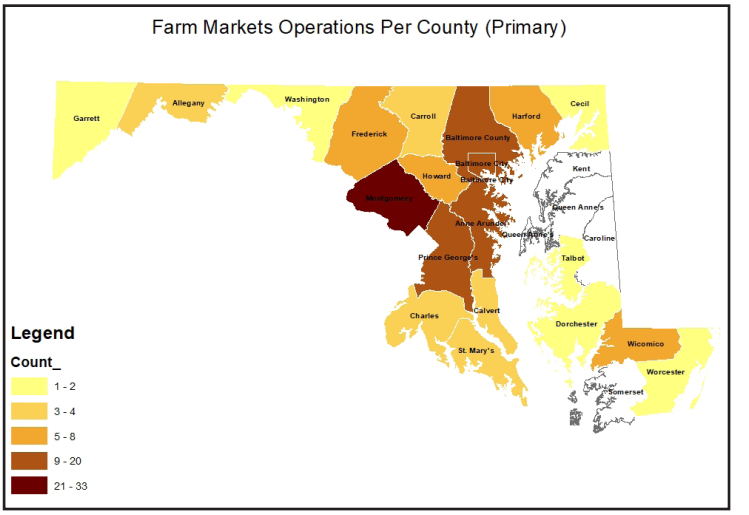
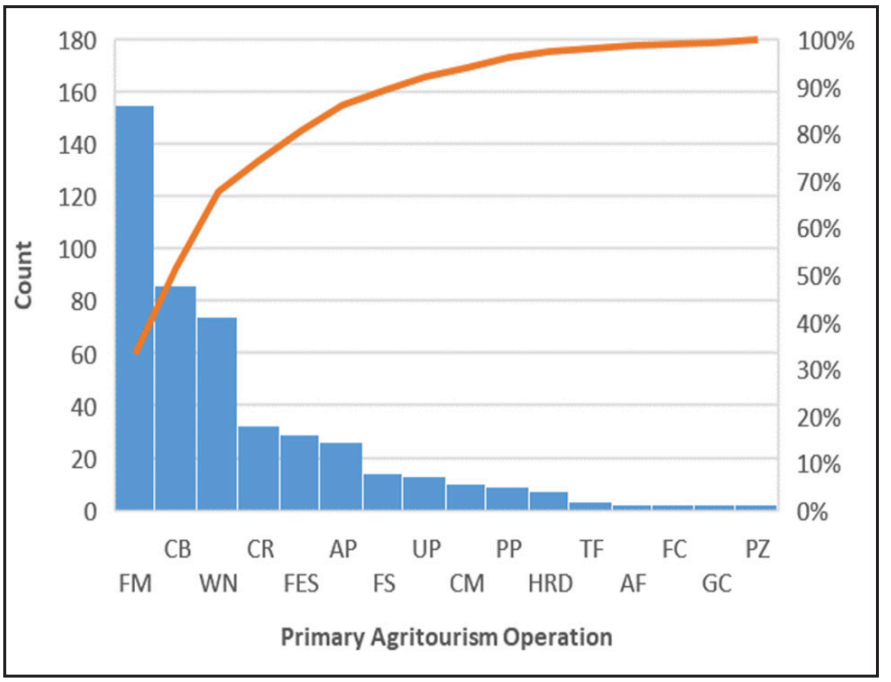


Figure 9. Map of Maryland Counties Describing the Distribution of Farm Markets as the Primary Agritourism Service

Farm Festivals

When we examine the geographic distribution of farm festivals (Figure 10), we find a distinct dissimilarity with the spread of farm markets. The agritourism operators hosting farm festivals as primary services concentrate in the upper and lower eastern shore regions. Somerset County on the lower eastern shore and Talbot County on the upper eastern shore reported the highest percentage of primary farm festivals. By comparison, Somerset County operators had the smallest number of farmers' markets as a primary service. The four counties on the lower eastern shore reported high numbers of farm festivals.



FM – farm market
CB – craft brewery
WN – winery
CR – creamery
FES – festival
AP – apiary
FS – farm store
UP – pick-your-own
CM – corn maze
PP – pumpkin patch
HRD – horse riding
TF – teaching farm
AF – alpaca farm
FC – farm camp
GC – garden center

Figure 8. Pareto Chart – Count of Primary Agritourism Operations

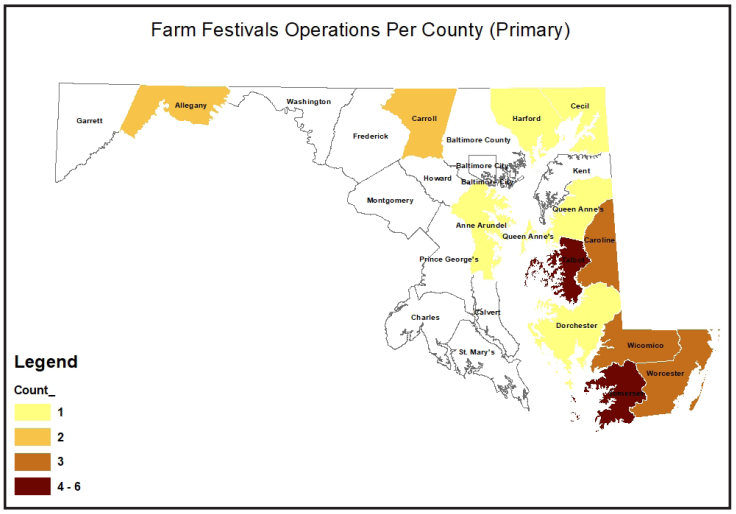


Figure 10. Map of Maryland Counties Describing the Distribution of Farm Festivals as the Primary Agritourism Service

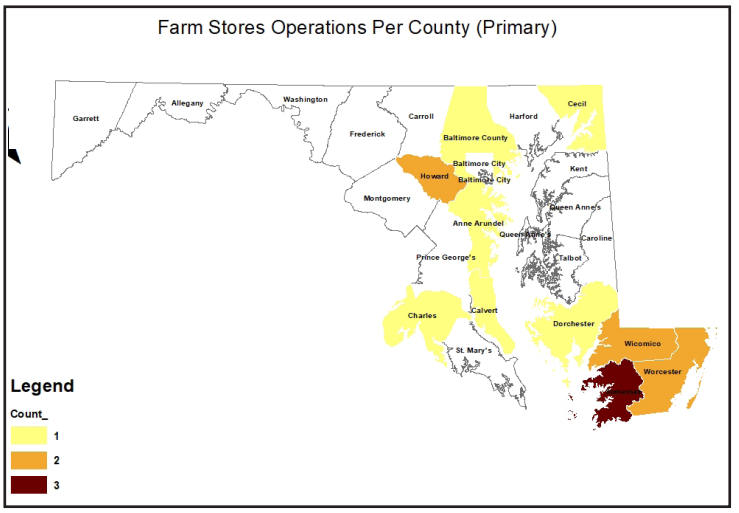


Figure 11. Map of Maryland Counties Describing the Distribution of Farm Stores as the Primary Agritourism Service

Interestingly, counties in the north-central and southern regions reported the lowest count of farm festivals but the highest count of farmers' markets. The level of urbanization may be a determinant in the capacity of a region to host farm festivals. While the presence of urban areas distinguishes the north-central and southern counties, the Eastern Shore is a more rural environment that may accommodate farm heritage and cultural festivals. Population distribution and a larger consumer base would most likely influence the concentration of farmers market in the metropolitan county areas of the north-central and southern regions of the state.

Farm Stores

Figure 11 describes the county-based distribution of farm stores in the state. Farm stores or stands are roadside retail stores, distinguishable from farm markets representing large sales outlets for multiple products. Farm stores display and sell products directly to customers for small- and medium-sized farms. Somerset County recorded the highest count of farms incorporating farm stores as the primary agritourism service in the lower eastern shore. The other three counties in the lower eastern shore (Wicomico, Worcester, and Dorchester) and Howard County in the north-central region followed, with many farm stands. The distribution of farm stands may be related to the different categories of farm sizes across the counties. Counties with a large proportion of small- and medium-sized farms could potentially support farm stores as direct customer sales outlets compared to counties with a higher representation of large farms. Large farms would likely support more extensive farm markets. These assumptions will be tested using the stakeholder survey that will follow the present baseline assessment.

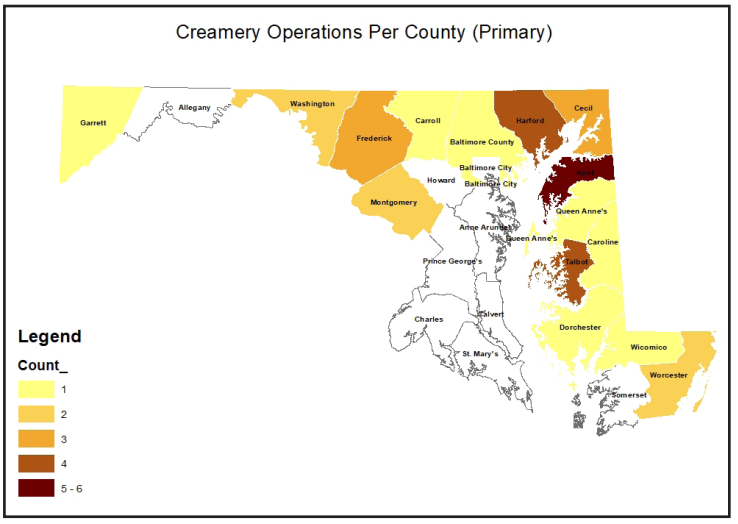


Figure 12a. Map of Maryland Counties Describing the Distribution of Creamery Operations as the Primary Agritourism Service

Farm Creameries

Farm creameries are choice agritourism attractions prevalent as an extension of Maryland dairy farms. Figures 12a and 12b describe the spatial distribution of farm creameries. As seen in Figure 12a, Kent and Talbot counties in the upper eastern shore region have the primary concentration of farm creamery agritourism. The Harford County agritourism facilities in the north-central region also host a significant number of farm creamery operations. The southern Maryland counties (Prince Georges, Charles, St. Mary's, Calvert, and Anne Arundel) host the fewest primary farm creamery operations. Allegany and Howard counties in the western and north-central regions do not have many primary farm creamery agritourism operations. Notwithstanding the limited attention to the farm creamery as a primary agritourism service in north-central Maryland, the north-

central county of Frederick hosts the most secondary farm creamery operations (Figure 12b). Secondary farm creamery agritourism is also very much in operation in Baltimore County and in St. Mary's County in southern Maryland.

Farm Wineries

As evident in Figure 13, Frederick County in the north-central region recorded the highest concentration of wineries. Additionally, Montgomery, Washington, Cecil, and Baltimore counties host high numbers of wineries. Winery agritourism facilities are profuse in north-central and southern Maryland counties, except in Charles and Howard counties. Compared to services such as farm markets and farm stands, the distribution of wineries does not appear to be county-specific. Garret, Charles, Queen Anne's, Howard, Caroline, and Somerset counties did not record winery operation as a primary agritourism service.

Craft Breweries

Figure 14 illustrates the spatial distribution of craft breweries. Expectedly, craft breweries are more preponderant in city areas. While Baltimore City recorded no winery presence, it was within range of the second-highest concentration of craft breweries. This observation further buttresses the assumption that the location of agritourism facilities appears to be area- and county-specific. Craft breweries have spread significantly evenly across counties, compared with wineries. Generally, the spread of primary craft brewery agritourism facilities closely mirrors the distribution of wineries, although the craft brewery facilities appear to be less concentrated in specific areas.

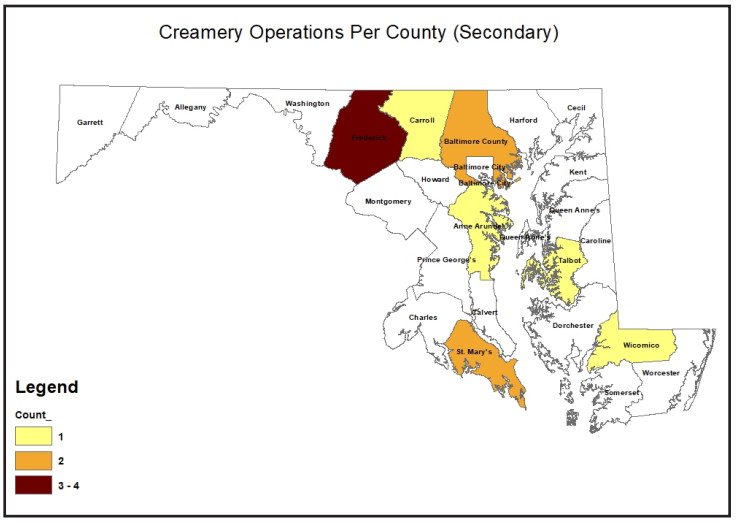


Figure 12b. Map of Maryland Counties Describing the Distribution of Creamery Operations as the Secondary Agritourism Service

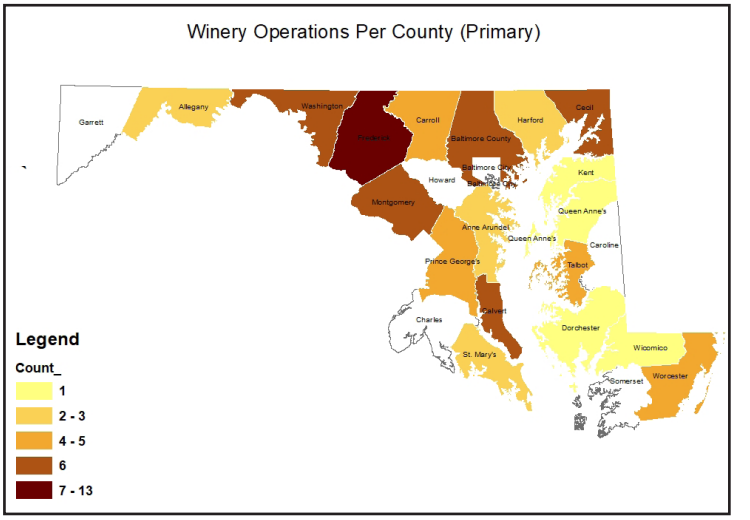


Figure 13. Map of Maryland Counties Describing the Distribution of Winery Operations as the Primary Agritourism Service

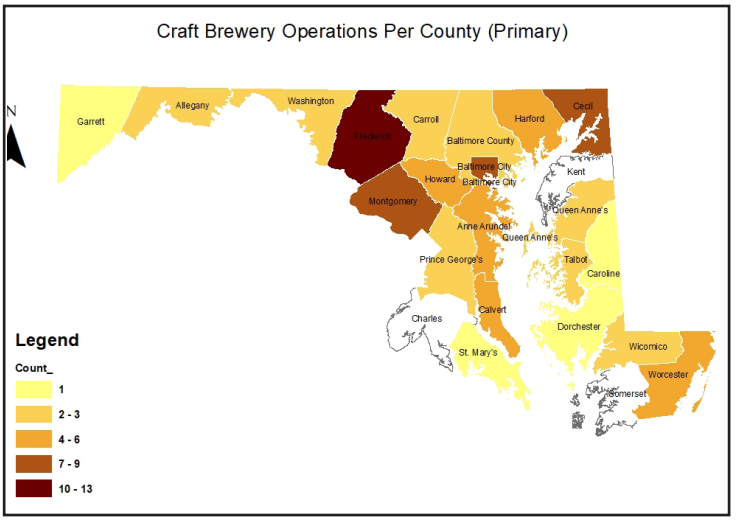


Figure 14. Map of Maryland Counties Describing the Distribution of Craft Brewery Operations as the Primary Agritourism Service

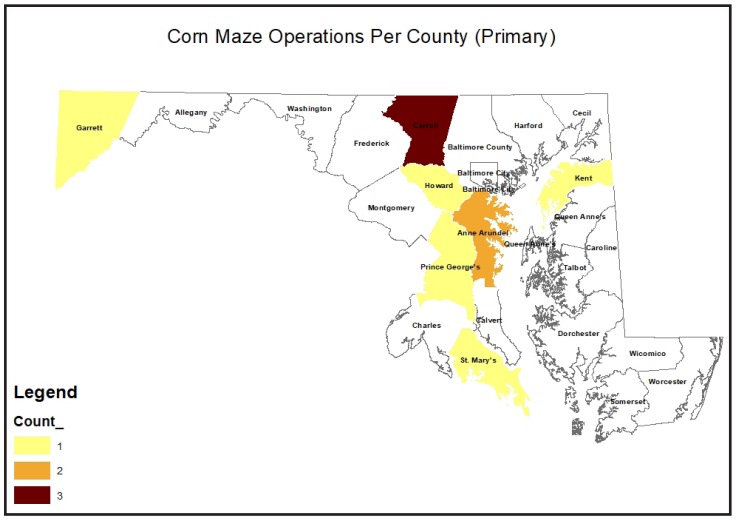


Figure 15. Map of Maryland Counties Describing Corn Maze Operation Distribution as the Primary Agritourism Service

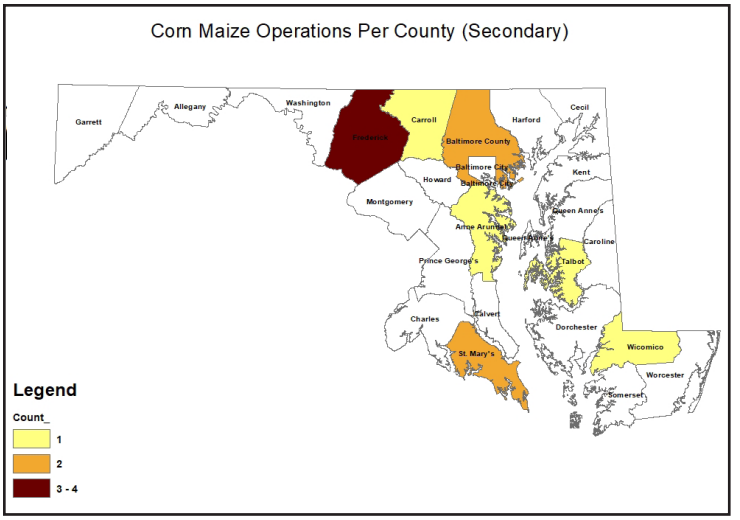


Figure 16. Map of Maryland Counties Describing Corn Maze Operation Distribution as the Secondary Agritourism Service

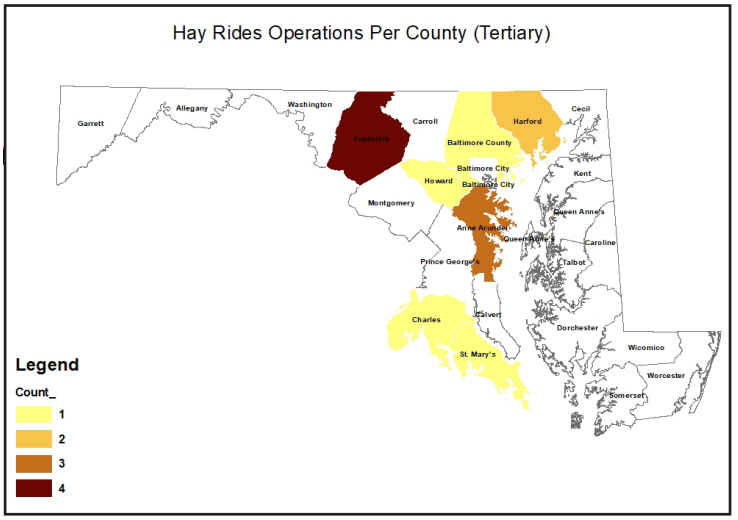


Figure 17. Map of Maryland Counties Describing the Distribution of Hayrides Operations as the Primary Agritourism Service

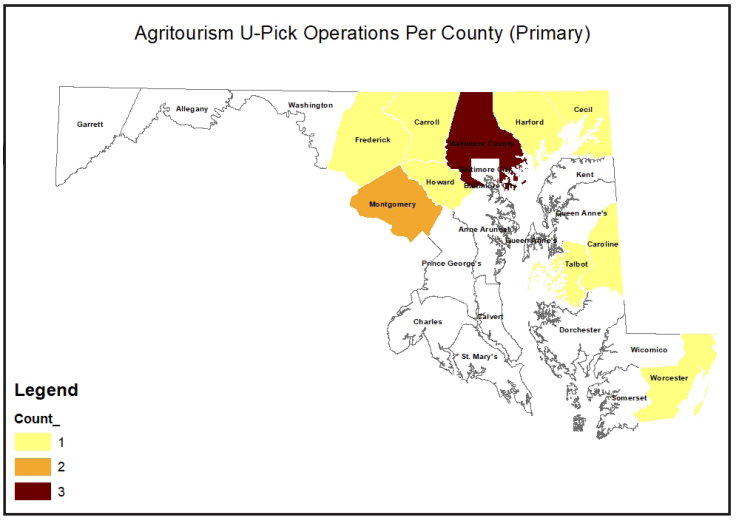


Figure 18. Map of Maryland Counties Describing the Distribution of U-Pick Operations as the Primary Agritourism Service

Corn Mazes

Figures 15 and 16 are county maps of Maryland showing the distribution of corn maze agritourism facilities as primary and secondary services, respectively. The corn maze is a typical agritourism operation of Maryland farmers. The geographic distribution of corn mazes shows that Carroll County in the north-central region hosts the highest concentration, operating corn mazes as an income-earning primary farm recreational activity. Anne Arundel County in southern Maryland follows a close second. Garret, Prince Georges, Howard, St. Mary's, and Kent counties also have high counts of agritourism operations with the corn maze as its primary service. As seen in Figure 14, the corn maze is also prevalent as a secondary agritourism operation in some counties. Frederick County tops the group of counties that host corn mazes as a secondary agritourism service. Baltimore and St. Mary's counties follow a close second with secondary corn maze agritourism services.

Hayrides

Figure 17 shows the distribution of hayride agritourism operations. Farm-related agritourism and recreational operators rarely incorporate hayrides as the leading service or attraction. Frederick County tops the count for hayride agritourism. Other notable counties with widespread presence of this agritourism variant are Anne Arundel and Hartford, in order of significance. Baltimore County, Howard, Charles, and St. Mary's County operators also incorporate hayride attractions as tertiary services.

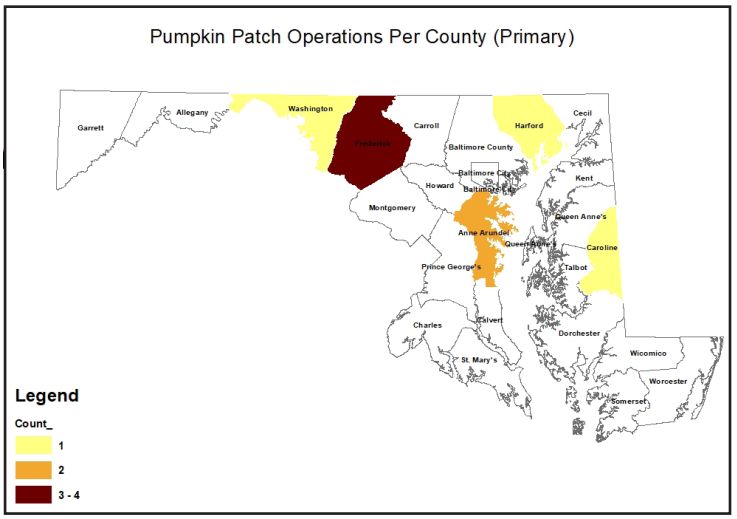


Figure 19. Map of Maryland Counties Describing the Distribution of Pumpkin Patch Operations as the Primary Agritourism Service

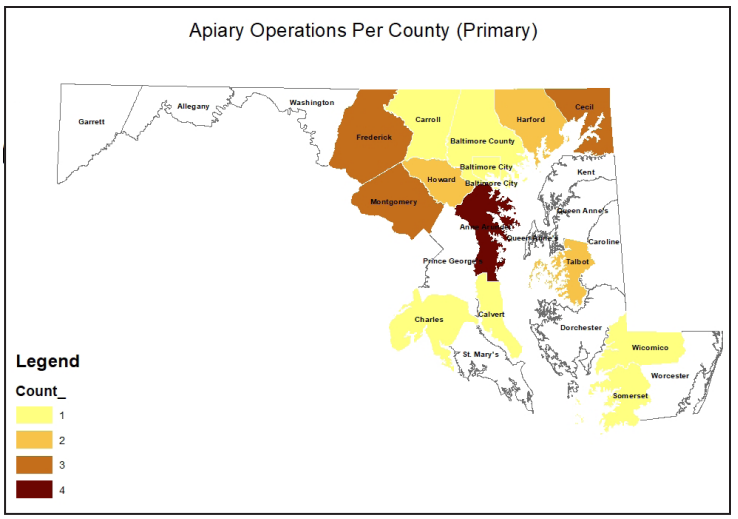


Figure 20. Map of Maryland Counties Describing the Distribution of Apiary Operations as the Primary Agritourism Service

Pick-Your-Own (U-Pick)

Figures 18 and 19 show counties with widespread operation of U-pick (pick-your-own fruits and vegetables) and pumpkin patches as primary agritourism services, respectively. Though U-pick and pumpkin patch operations are broadly distributed across farm-related agritourism operations, the maps present spatial illustrations of areas that incorporate U-pick and pumpkin patch operations as primary services. Baltimore County, followed by Montgomery County, hosts the highest number of primary U-pick agritourism facilities. The two counties' position is not surprising, since they comprise cities with a large consumer base and access to the transportation required to market fresh fruits and vegetables directly. Frederick County, followed by Anne Arundel, hosts the most primary agritourism pumpkin patches.

Apiaries

Apiary (beekeeping and honey production services) operate as primary agritourism within the choropleth areas shown in Figure 20. Anne Arundel County in southern Maryland has the largest concentration of farms with primary apiary (beekeeping) agritourism operations. In the north-central and upper eastern shore regions, Frederick, Montgomery, and Kent counties follow a close second, with farm-based apiaries open to visitors.

FACTORS AFFECTING PARTICIPATION IN AND LOCATION OF AGRITOURISM FACILITIES

A variety of studies have examined the factors that influence the concentration of agritourism operations within an area. According to Brown and Reeder (2007), factors that affect variation in the capacity and motivation to be involved in farm recreation business and the operator's earnings are divisible into place-based and farm-based factors. Placed-based factors include distance to the nearest city of 10,000 or more people, the population density of the area, county highway mileage, and the natural amenities index. The index of natural amenities indicates that specific natural amenities are essential for some farm recreation activities. Brown and Reeder also listed farm-based factors such as an operator's net worth, farm acreage, and hours spent on the farm, especially during summer. Spending more hours on the farm means that operators are more available to oversee farm recreation activities. In a study by Bagi and Reeder (2012) entitled "Factors affecting farmer participation in agritourism," they examined "the characteristics of the farm's land and operations, the farm household's wealth or net worth, the characteristics of the farm operator, as well as the location of the farm based on a geographic continuum of urban and rural areas" (p. 3).

Similarly, McGehee and Kim (2004) examined farm size or the number of acres owned as an influence on farm agritourism participation. Che et al. (2005) explored the factors of infrastructure and socioeconomic conditions, and Mace (2005) explored the influence of farm and operator characteristics. In terms of place-based characteristics, Bagi and Reeder (2012) found that

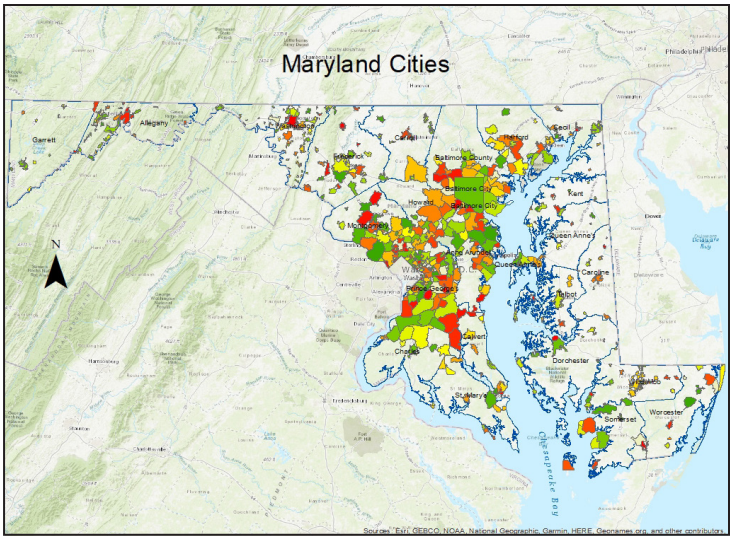


Figure 21. Map of Maryland Showing City Areas. Data Source: U.S. Census Bureau

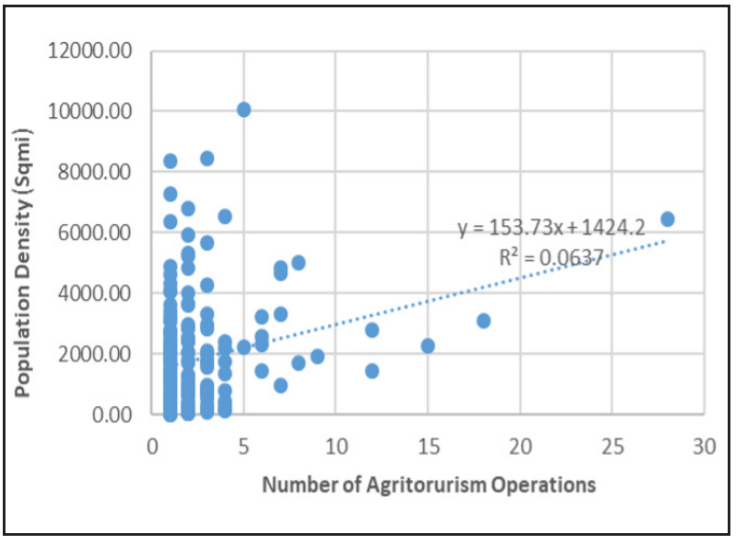


Figure 22. Population Density of Cities with 10,000 or More People and Count of Agritourism Operations

proximity to a city of at least 10,000 population increased the chances of hosting an agritourism operation. Therefore, central cities in counties had a positive influence on the location of a agritourism facility with public access to its location. We conducted a descriptive pre-assessment of some of these critical factors, such as population density, transportation infrastructure, socioeconomic conditions, natural amenities index, and proximity to urban areas for the present report. However, the implications of these factors, farmlands, and stakeholder characteristics' functions will be tested with the stakeholder survey following this exploratory assessment.

Population Density

Figueiredo et al. (2002) found that agglomeration economies (spatial clusters of the same industry) and proximity to major urban centers influence business locations. According to Brown and Reeder (2007), agritourism earnings are highest in densely populated counties, in counties with a high county recreation/natural amenities score, counties with a high net-worth operator, and in areas with low or negative growth rates. They also observed that agritourism operations are located close to cities to attract a steady stream of customers. However, recreational activities such as hunting, angling, and trail riding are located far from metropolitan areas because of the natural amenities required. As the acreage of a farm with low crop yield increases, we assume that the tendency to engage in an agritourism activity would also increase. Second, regions with public access – that is, good transportation infrastructure and good quality of natural environment – would influence agritourism location. We equally assume that a large consumer base

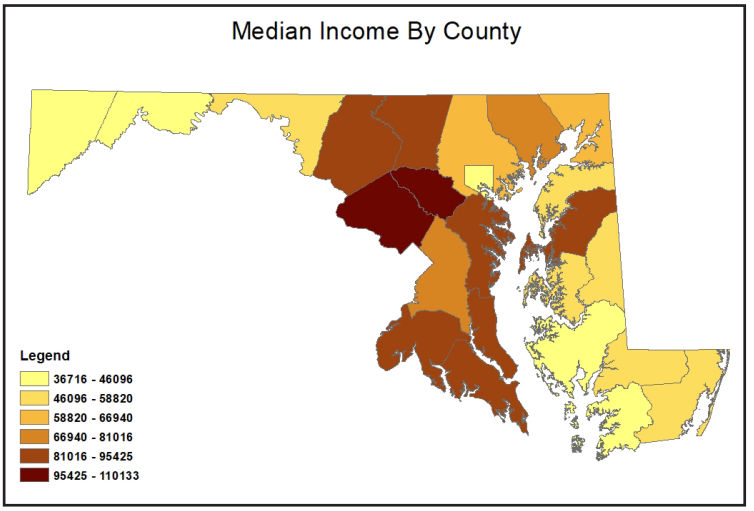


Figure 23. Map of Maryland Counties Describing the Distribution of Median Income. Data Source: State of Maryland

and the right socioeconomic conditions are likely to increase agritourism investment. Assessing these factors will provide additional guidance for extension service providers assisting in the promotion and development of agritourism facilities (Bagi & Reeder, 2012).

Population density is a measure of the consumer base of a geographic area. Figure 22 presents a chart of the association of the population density of cities in Maryland with a population of 10,000 or more with the number of agritourism operations within the city areas. (Figure 21 shows a map of the city areas.) The percentage of variation in the population density associated with variation in the number of agritourism operations in the cities is approximately 0.4%. While not fully modeled and described, this result provides an indication that the influence of population density on the concentration of agritourism operations is potentially weak in Maryland, as less than 1% of the population density changes of a city

is described by the variation in the number of agritourism facilities in the city. Even so, this weak association is only relevant to city areas with more than five agritourism facilities. There was no association between the number of facilities and population density in cities with five or fewer agritourism locations.

Median Income

Median income level is also a useful variable for assessing the viability of a location for agritourism. Lucha et al. (2019) observed that siting an agritourism facility near metropolitan city areas provides access to the residents' cash flow. Additionally, Marrocu and Paci (2012) noted that since metropolitan city areas are well developed, they attract visitors. Figure 23 is a map of the distribution of median income by county. The top counties include Frederick, Montgomery, Howard, Prince Georges, Carroll, Saint Mary's, Charles, and Anne Arundel. Compared against the count of agritourism operations per county (Figure 6b), 50% of the top median income counties, except St Mary's, Charles, Howard, and Carroll counties, top the list with the highest numbers of agritourism locations. However, this observation does not explain the impact (or lack thereof) of median income on the county distribution of agritourism locations, but only describes a likely direction for the relationship. A stakeholder survey would provide realistic information to test this assumption.

Proximity

Lucha et al. (2019) stated that its proximity to a consumer base impacts an agritourism operation's success. Like most businesses, distance and ease of transportation access are essential attributes of an agritourism business. Bernardo et al. (2004) found that visitors' average distance to an agritourism event in Kansas was 129 miles. However, over 50% of the visitors traveled less than 50 miles to events. We examined the distance between cities with more than 10,000 people and agritourism facilities in each county in the State of Maryland, as shown in Table 3 and Figure 24. For instance, the maximum and minimum distance between a city of 10,000 or more people and an agritourism facility in a county in Maryland is 32.04 (Worcester County) and 0 miles (Howard), respectively. Figure 22 describes the minimum, maximum, and mean distances with a combo bar chart. Most agritourism facilities in Anne Arundel, Prince Georges, and Montgomery counties were equally located on the aggregate approximately 29 miles from the city areas (Figure 24, Table 3). Allegany (0.10 miles), Washington (0.38 miles), Talbot (0.25 miles), Howard (0.0 miles), Montgomery (0.31 miles), and Baltimore (0.12 miles) recorded the shortest distance between the cities and an agritourism location. The mean distance between the cities and the counties' facilities ranged

County	Minimum	Maximum	Sum	Mean
Baltimore	2.19	17.55	4901.88	8.57
Allegany	0.10	9.12	52.11	4.34
Worcester	1.48	32.04	165.90	9.76
Wicomico	0.88	13.72	126.99	6.68
Washington	0.38	14.76	210.85	8.11
Talbot	0.25	11.43	106.29	5.06
St Mary's	1.19	23.87	182.32	13.02
Montgomery	0.31	27.54	15349.94	10.77
Howard	0.00	22.66	891.10	8.91
Harford	1.06	25.83	1528.84	11.08
Frederick	0.83	23.10	1364.12	9.09
Dorchester	1.12	15.21	47.44	4.74
Charles	3.95	18.19	82.46	8.25
Cecil	0.43	16.65	254.94	9.44
Carroll	0.36	21.83	399.05	9.50
Prince Georges	0.42	30.17	9979.63	11.63
Baltimore City	0.12	4.79	58.66	2.26
Anne Arundel	0.36	30.29	6614.46	11.79

Table 3. Mean, Median, and Maximum Distances (Miles) Between Agritourism Facilities and Cities of More Than 10,000 People in Counties in Maryland

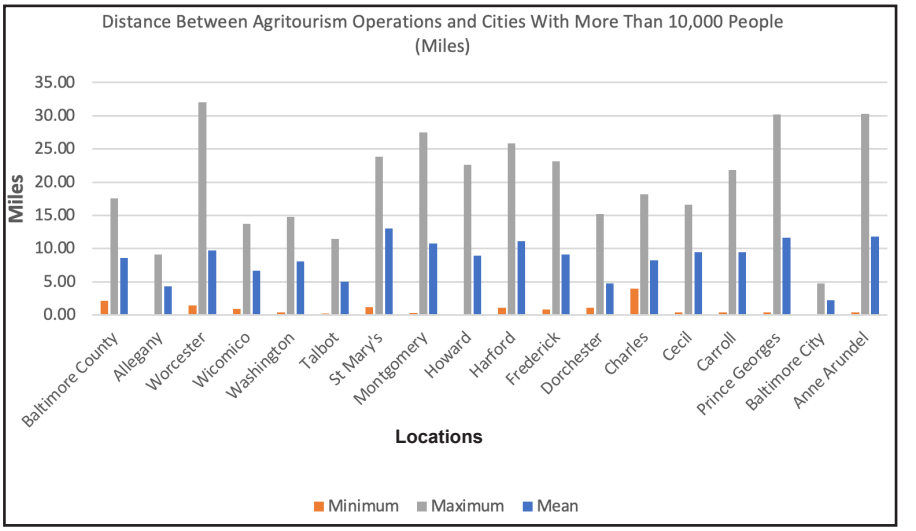


Figure 24. Distance Between Agritourism Operations and Cities With More Than 10,000 People (Miles)

from 2.26 (Baltimore City) to 13.02 miles (St. Mary's County; Table 3). Compared to Bernardo et al.'s (2004) findings in Kansas, when between-county travel is considered, agritourism facilities in the State of Maryland tend to be located at closer proximity to city areas. On average, visitors will travel less than 32 miles between a city and an agritourism facility within the same county.

REGIONS		SOUTHERN	NORTH CENTRAL	WESTERN	UPPER EASTERN SHORE	LOWER EASTERN SHORE
PREFIX	ROUTE					
US	40		X	X		
US	1	X			X	
US	50					X
US	13					X
US	113					X
MD	140		X			
MD	2	X				
MD	5	X				
MD	313				X	
MD	213				X	
I	95	X	X			
I	70		X			
I	270		X			
I	97	X				
I	68			X		

Table 4. List of US, Maryland, and Inter-State Highways Used for Network Route Analysis of Proximity to Agritourism Businesses

Transportation

Regional Analysis – Access to Transportation

Sorupia (2005) notes that tourism cannot thrive without transportation. Since transportation is vital to travel, the transportation system to a destination is significant in the tourist experience. The availability, accessibility, and proximity of transportation infrastructure for consumers impact operators' agritourism and capacity to enhance their incomes through recreation-related farm activities. The transportation system is vital for coupling both operators and consumers alike. In other words, the proximity of and access to an affordable transport system influence agritourism operators' income-generating capacity. Sarupia (2005) further observed that accessibility can make or break a destination, especially concerning visitor numbers.

Lucha et al.'s (2019) geographic analysis of Virginia's agritourism distribution found that the proximity to consumer markets and the structure and composition of the consumer markets, ease of transportation, and location and types of natural amenities all played a role in the location of agritourism services. According to Lucha et al., proximity influences the number of visitors attracted by agritourism businesses in Virginia. The distance of the interstate highway from the agritourism center was one of the primary factors affecting tourist visits. They also noted that a lack of road signs and the ability to find qualified tour guides were factors limiting agritourism center ability to attract visitors.

An agritourism business's proximity to the transportation route affects its ability to attract visitors and to find and attract experienced and cost-effective labor – which is often seasonal (Lucha et al., 2019). A poor road network and labor limitations are significant variables to consider with any program to promote agritourism. Increased urbanization and changing land use patterns have tremendously reduced the size of agricultural land in Maryland (Nickerson et al., 2001), raising the need for efficient and sustainable utilization of available agricultural land. The present report also describes the proximity of transportation routes (Lucha et al., 2019) to Maryland's agritourism business locations.

Access to Transportation Networks

The following routing analysis was conducted to estimate the proximity of the agritourism centers to important transportation arteries in Maryland. We estimated the exact route distance between US and state highways (Table 4) and the position of each of the agritourism businesses by using ArcGIS Network Analysis. The network tool analysis can determine the shortest path to a point location along a transportation route. As cited in Lucha et al. (2019), Marrocu and Paci (2012) identified that the origin to destination (OD) distance between two points can be used to represent transportation cost. The routing analysis of the agritourism businesses against state highways across the state was conducted with an OD cost matrix tool. OD cost matrix is used to represent a matrix of costs in moving from a set of origins to a set of destinations (ESRI, 2010).

We examined the access and proximity of agritourism facilities to US and state highways across the five geographic regions in the state (north-central, southern, western, lower eastern shore, upper eastern shore). The cost chosen for the analysis was the distance in miles

between the location of agritourism facilities and the nearest junctions of US and state highways.

Origin to Destination Cost Matrix Analysis

This method provides a more accurate analysis of the distance between the locations of each of the businesses and the paths of the roadway because it estimates distance based on the exact driving paths to the point locations of the agritourism centers, unlike in the use of Euclidean distance measures. Euclidean distance measures a straight line from the origin (a business) to the destination (the nearest point on the road) and thus does not consider the changes in direction of the roadway – the paths the tourist has to take to get to the location of the agritourism facility. Next, using the OD distance cost matrix analysis, we estimated 1) the least-cost routing distance between the agritourism business location and all significant US highways, and 2) the number of important junction routes linking the business locations from each significant US or Maryland state highway. Based on the summary distance data from these two analyses, we compared the distance of the business location from/between the five geographical regions in the state.

Generally, the OD cost matrix results revealed that agritourism sites were located between maximum ranges of 50 to 180 miles across the five geographic regions in the state from US and state highways, using a search tolerance of 10 miles on either side of the highways. The minimum distances ranged from zero to 5 miles. The average distances ranged between 14 and 76 miles. This result suggests that the computed measurements from the location of the agritourism businesses (origins) to the closest junctions on the highways contained some very extreme values. The results for the individual regions and highways are described below.

North-Central Region

Figure 25a shows the mean, maximum, and minimum distances in miles from Maryland's significant highways to agritourism locations in the north-central region. The study examined the cost in miles from agritourism facilities to US 40, MD 140, US 1, I-95, I-70, and I-270 highways. The minimum distance values mean that, from certain junctions, agritourism facilities are situated near US 40, MD 140, and US 1. US 1 Highway had the shortest average distance (15 miles) to agritourism facilities in the north-central region. This was followed by 1-95 (30 miles) and MD140 (33 miles) highways in that order. US40 and I-70 also presented the greatest distance (180 miles) between US highways and agritourism facilities.

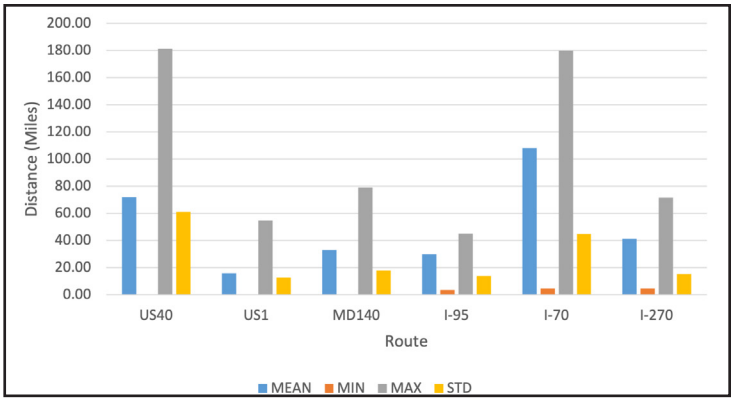


Figure 25a. Plot Showing Mean, Maximum, and Minimum Distances (Miles) From Major Highways to Agritourism Locations in the North-Central Region

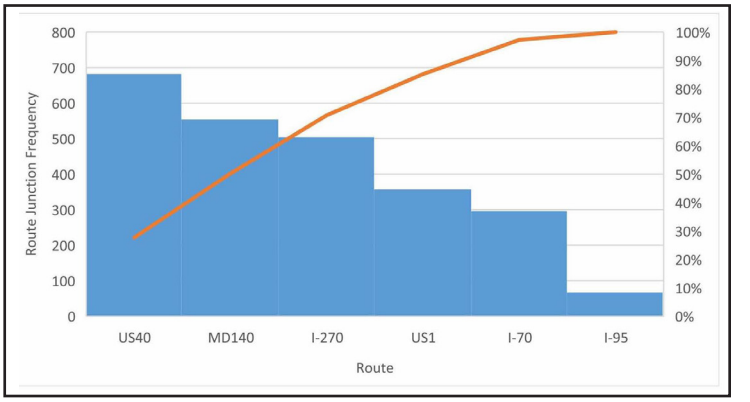


Figure 25b. Plot of Routes From Junctions on Major Highways to Agritourism Sites in the North-Central Region

Figure 25b shows the frequency of routes from junctions on major highways to agritourism sites in the north-central region. The frequencies describe the possible routes from US highways to the various agritourism locations along its axis. For instance, they indicate that US40 has more routes to the agritourism locations compared to the other major highways in the north-central region of the state. In other words, considering the buffer distance chosen for the analysis, US40 had a higher frequency of agritourism operations at closer proximity. In the same vein, Highway I-95 has the fewest routes to the agritourism facilities.

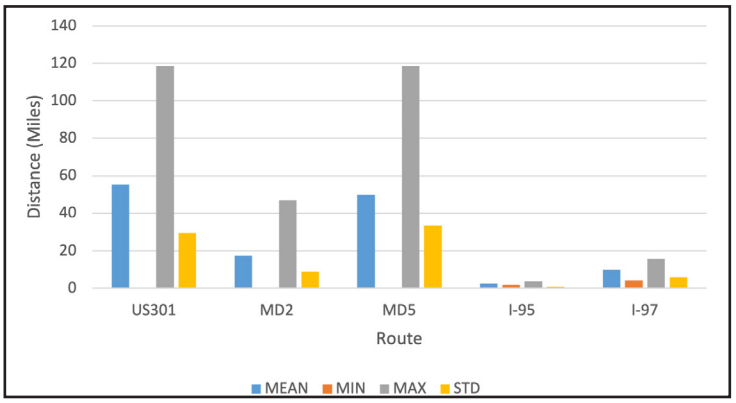


Figure 26a. Plot Showing Mean, Maximum, and Minimum Distances (Miles) From Major Highways to Agritourism Locations in Southern Region

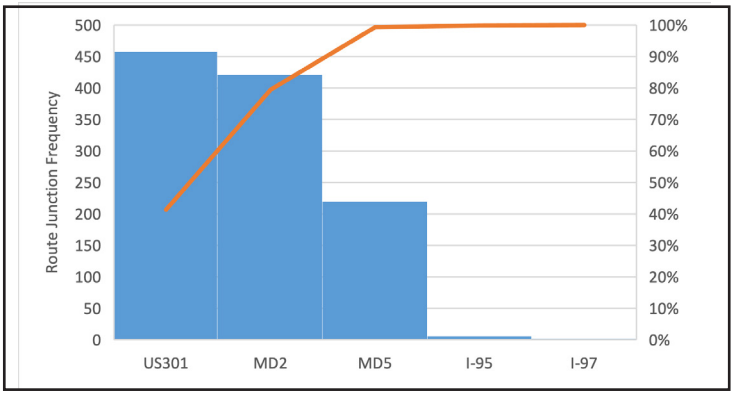


Figure 26b. Plot of Routes From Junctions on Major Highways to Agritourism Sites in the Southern Region

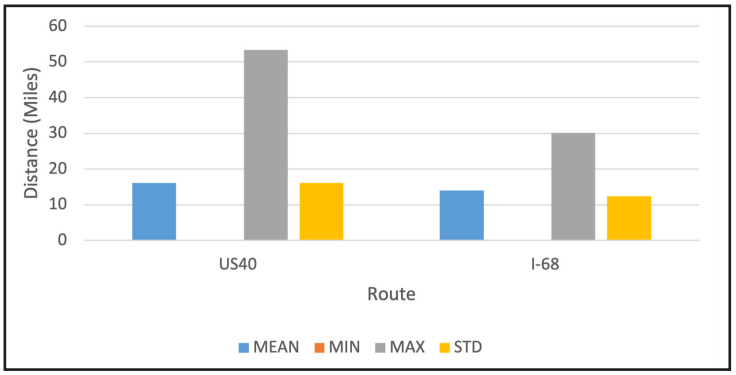


Figure 27a. Plot Showing Mean, Maximum, and Minimum Distances From Major Highways to Agritourism Locations in Western Region

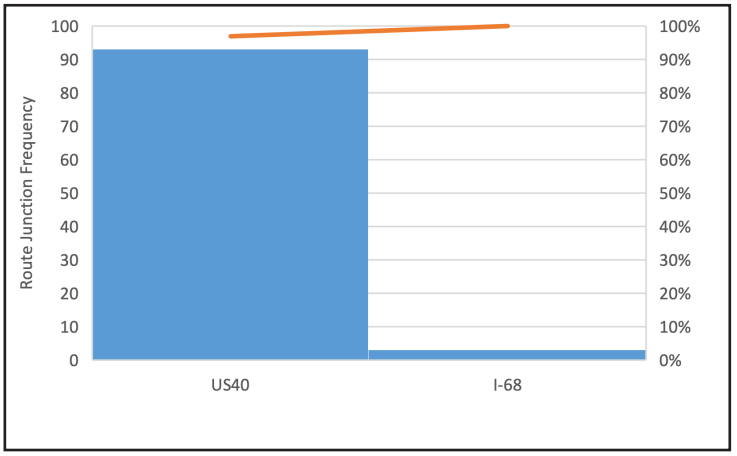


Figure 27b. Plot of Routes From Junctions on Major Highways to Agritourism Sites in the Western Region

Southern Region

Figure 26a displays results from the OD cost matrix analysis conducted for southern Maryland with US301, MD2, MD5, I-95, and I-97. The junctions along these US highways served as the points of origin for the analysis. The I-95 Highway was the closest transportation route to agritourism locations. I-95 had the shortest average distance (2 miles) of the agritourism facilities within the southern region, based on the buffer distance adopted for the analysis. The maximum distance of the listed facilities from the I-95 was approximately 4 miles - compared to US301 (119 miles), MD5 (119 miles), MD2 (46 miles), and I-97 (16 miles). The I-95 Highway also had the lowest standard deviation from the mean distance. However, there was zero minimum distance between the US301 and MD2 highways and some agritourism locations.

Examining the frequencies of the highway routes, Figure 26b shows that US301 had more routes (access) to the agritourism locations than the other major highways in the state's southern region. In other words, considering the buffer distance chosen for the analysis, US301 had a greater number of agritourism operations nearer its junction points along the highway. US301 was followed closely by MD2; I-97 has the smallest number of routes.

Western Region

Figure 27a provides the minimum, maximum, and mean distances of agritourism facilities to the major highways in western Maryland. We assumed the same buffer distance (10 miles on either side of the highway) for the origin to destination cost analysis in all the regions. Two highways were adopted for this analysis because they are the primary highways that run through the region. Each of the two adopted highways (US40 and I-68) had zero minimum distance to the agritourism facilities. The highways' average distances to the agritourism locations were similar: 16 miles (US40) and 14 miles (I-68). The standard deviation of the individual agritourism locations' distances from the mean was higher for US40. US40 recorded the longest maximum distance (54 miles) from an agritourism location, compared to 30 miles for I-68. Additionally, Figure 27b shows that US40 had the greatest ease of access (junctions) to tourism locations. The US40 comprised approximately 94% of the junctions connecting the two highways to the agritourism locations.

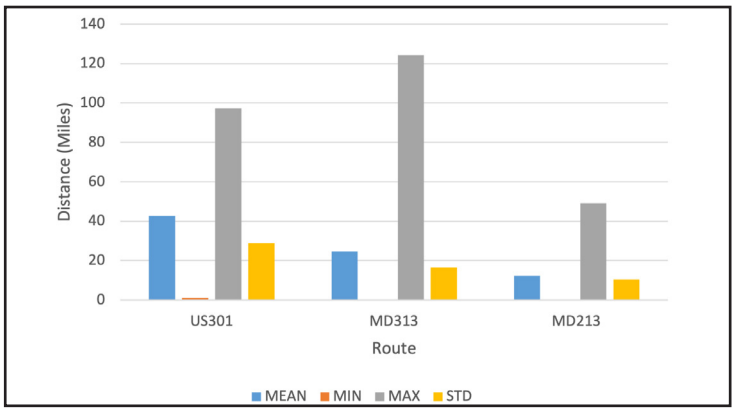


Figure 28a. Plot Showing Mean, Maximum, and Minimum Distances From Major Highways to Agritourism Locations in the Upper Eastern Shore Region

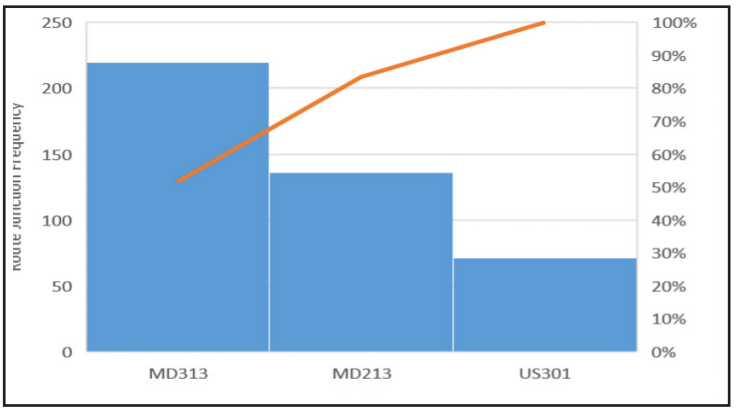


Figure 28b. Plot of Routes From Junctions on Major Highways to Agritourism Sites in the Upper Eastern Shore Region

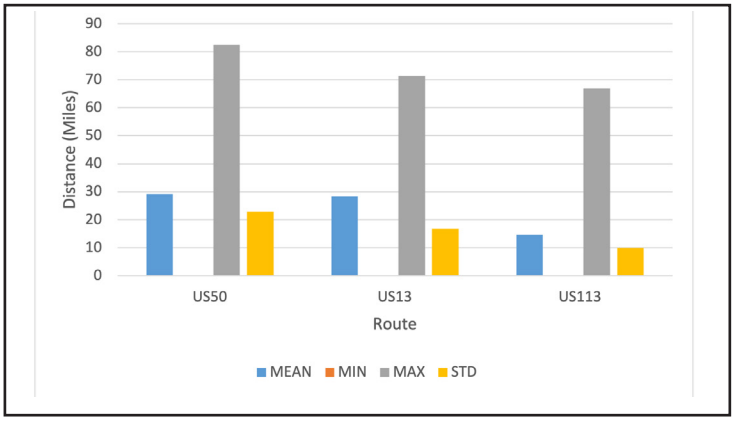


Figure 29a. Plot Showing Mean, Maximum, and Minimum Distances From Major Highways to Agritourism Locations in the Lower Eastern Shore Region

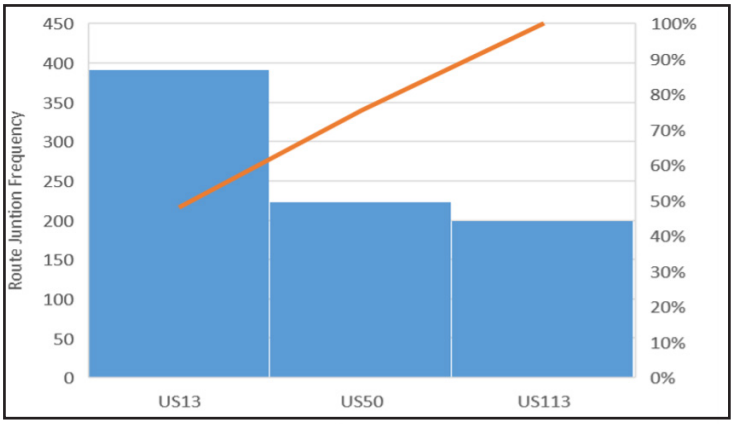


Figure 29b. Plot of the Count of Routes From Junctions on Major Highways to Agritourism Sites in the Lower Eastern Shore Region.

Upper Eastern Shore Region

US 301, MD 313, and MD 213 were identified as the primary US highways in Maryland's upper eastern shore. Figure 28a shows the proximity of the agritourism facilities to these highways. Among them, MD 213 had the lowest mean distance (12 miles) to agritourism locations in the region. The standard deviation for the proximity of MD 213 to agritourism facilities along the route from the mean was equally the lowest. This suggests that MD 213 provides the most cost-effective access to agritourism operations in the upper eastern shore. Nonetheless, agritourism facilities along MD 213 and MD 313 had approximately similar minimum distances (1.8 miles) from both highways. However, in Figure 28b, it is clear that MD 313 had more route junctions (220) connected to agritourism locations – relative to MD 213 (135) and US 301 (65). These junctions provide direct connections to the various agritourism locations along the highway routes.

Lower Eastern Shore Region

In the lower eastern region, we examined the primary highways – US 13, US 50, and US 113 – to determine the OD cost to agritourism locations (Figure 29a). Each of the three highways had a zero minimum distance to agritourism locations within the region. This result indicates that agritourism facilities are close to the highways. US 113 had the lowest mean distance to the facilities and the lowest standard deviation. The US 50 Highway had the highest maximum distance from an agritourism facility along its route. Also, US 113 had the fewest connecting junctions to agritourism locations. US 13 had about 48% of all junctions connected to agritourism locations among the three highways. In this region, US13 provides the greatest access to agritourism locations, while the US 113 junctions provide the least-cost distance to the facilities (Figure 29b).

Natural Amenities

Increasing demand by tourists to visit natural areas (Sarupia, 2005) in recent years has made the state of the natural environment an additional motivation and attraction for a tourist destination. The natural amenities index is a constructed variable that combines climatic, topographic, and water-related factors to measure environmental quality. The index ranges from −6.40 to 11.17, with higher numbers representing higher quality of natural amenities (Brown & Reeder, 2007). We incorporated the impact of the natural environment on agritourism facility location by comparing the USDA natural amenities index of the individual counties in the state and the concentration of agritourism locations in the counties. The quality (Sarupia, 2005) of the natural environment has declined as cities and suburban settlements encroach into rural, more naturally distinct countryside communities. Accordingly, Brown and Reeder (2007) note that farm recreation operations are more likely to be located in rural nonmetropolitan areas. Agritourism is equally motivated by the interest and enjoyment people have in visiting and reconnecting with rural areas.

Figure 30 is a Pareto chart showing the natural amenities index of counties in the state, in descending order. Aside from Allegany County, which reported the highest natural quality index (6.2 approx.), four groups of counties are discernable, with counties in each group recording approximately a similar quality index. Following the descending ranking of the counties on the chart, these are from Washington to Worcester (5.5 approx.), Dorchester to Queen Anne (5.3 approx.), Kent to Wicomico (4.4 approx.), and Carroll to Caroline (3.4 approx.) counties, the latter of which had the lowest ranking.

The study explored assumptions about the natural quality index's influence on the concentration of agritourism facilities. We found that a county's natural index ranking (Figures 30 and 31) did not quite approximate its count of agritourism facilities (Figure 6b). Alleghany and Washington counties reported the highest natural quality index; however, Frederick and Montgomery counties recorded the highest agritourism facility concentrations. Alleghany and Washington counties are grouped close to the lowest in terms of number of agritourism locations. Similarly, Charles and St. Mary's counties have reported some of the lowest agritourism facility counts but had a high natural quality index. Indeed, agritourism location is most likely a function of other location- or consumer-related factors – especially in the metropolitan counties.

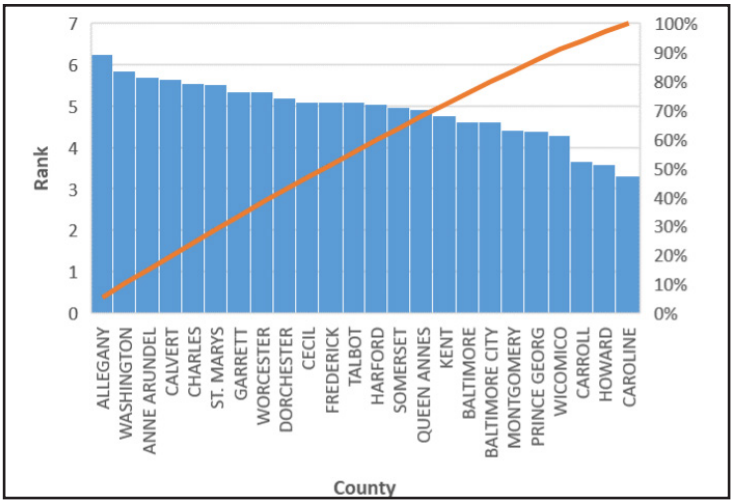


Figure 30. Natural Amenities Score of Maryland Counties in Descending Order of Rank. Data Source: USDA

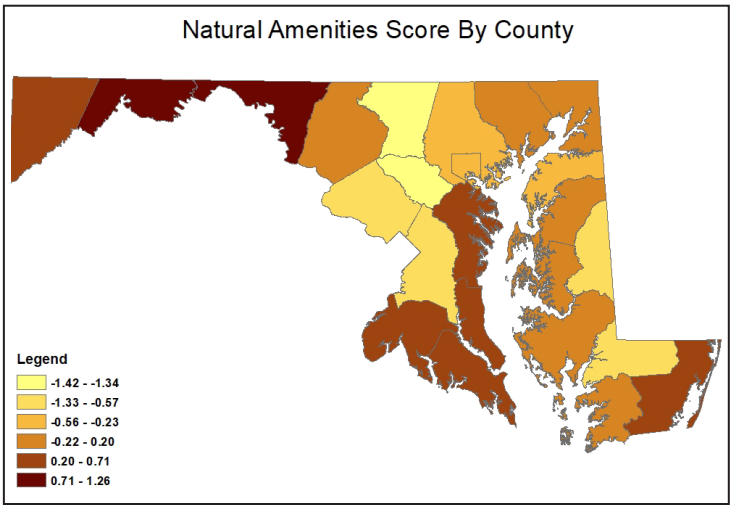


Figure 31. Map Showing County Distribution of Natural Amenities Index in Maryland. Data Source: USDA

Therefore, notwithstanding these descriptive findings, a more accurate assessment of the natural quality index's impact on agritourism facility location would require simultaneous assessment of multiple criteria.

INCOME FROM AGRITOURISM

In a USDA Economic Research Report by Brown and Reeder (2007), as of 2004, approximately 52,000 farms were earning additional incomes from farm-related activities such as hunting, horseback riding, and fishing. This number represented 2.5% of all United States farms. Agritourism income is especially vital for struggling farms experiencing economic hardship (Bagi & Reeder, 2012). The number of farms involved in such enterprise would multiply with farmers' increasing interest in earning additional income to retain and manage their landholdings. The southern states, including the State

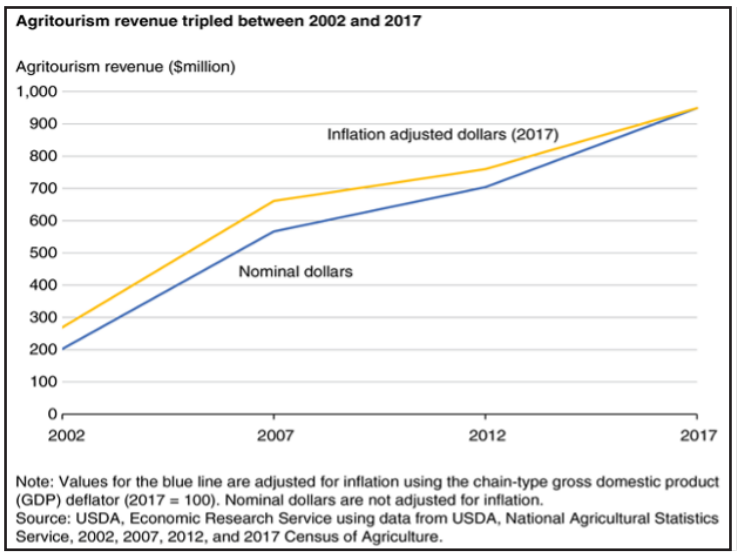


Figure 32. Agritourism Revenue in the United States, 2002–2017. Source: Whitt et al. (2019).

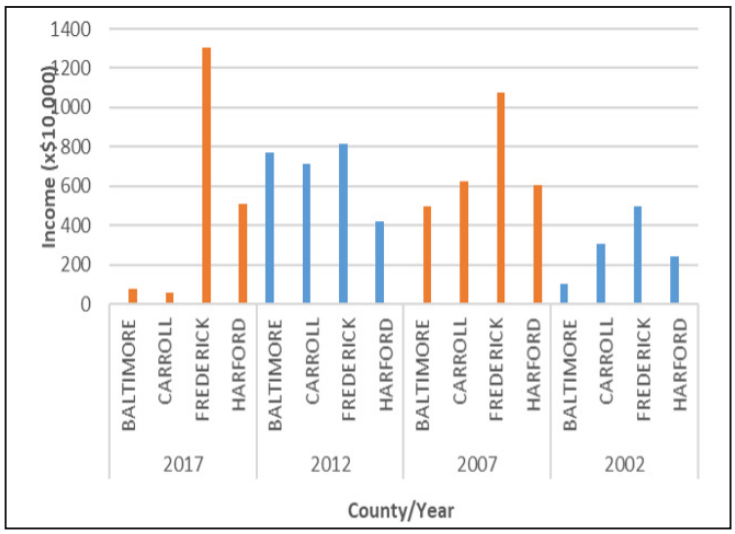


Figure 33a. Agritourism and Farm Recreational Income, North-Central Maryland. Data Source: USDA

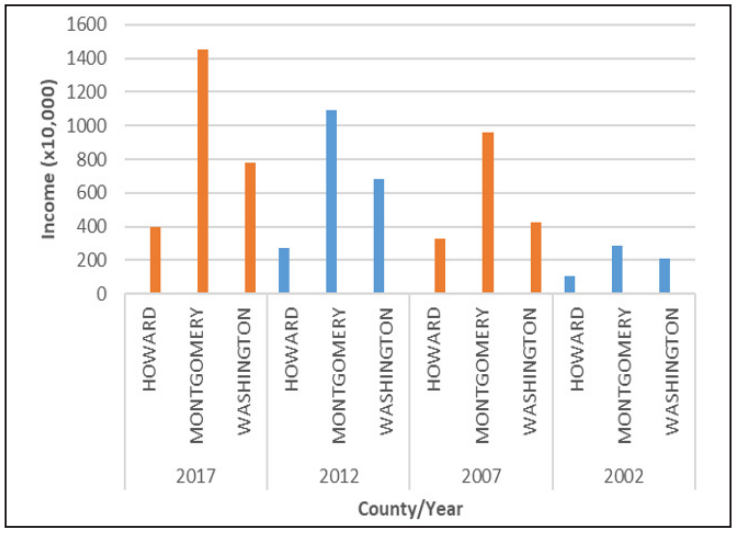


Figure 33b. Agritourism and Farm Recreational Income, North-Central Maryland. Data Source: USDA

of Maryland, represent more than 50% of farms that host such farm recreation-related businesses (Brown & Reeder, 2007). Ten of the top twenty states with high numbers of agritourism services per farm in 2007 were in the northeast. Bagi and Reeder (2012) note that farm-related agritourism income varies from region to region and depends on the types of agritourism services operated. Figure 32 shows a USDA national economic survey report of agritourism income in the United States. The chart indicates that agritourism income increased threefold between 2002 and 2017 (Whitt et al., 2019). We find similarities between the national trend data and the income trend of the agritourism revenue across Maryland regions (Figures 33a–37).

North-Central Maryland Agritourism Income

The regional trend of the distribution of farm-related agritourism recreational income was assessed using NASS/USDA data from 2002 to 2017. Generally, income from agritourism in the State of Maryland has been on the increase over the past decades. Figures 33a and 33b show the distribution of agritourism income per county in the north-central region. Montgomery and Frederick counties have consistently reported high income from agritourism recreational activities. Total revenue from agritourism activities in Montgomery and Frederick counties was approximately $2.8 million and $4.3 million in 2002, respectively, and $14.5 and $13 million in 2017 – showing an increased revenue of 500% and 300% respectively. Frederick County had the highest agritourism income in 2002 and 2007. Subsequently, in 2012 and 2017, Montgomery County witnessed comparatively higher net agritourism revenues. Baltimore, Carroll, and Howard counties have generally witnessed the lowest income earnings from agritourism in this region.

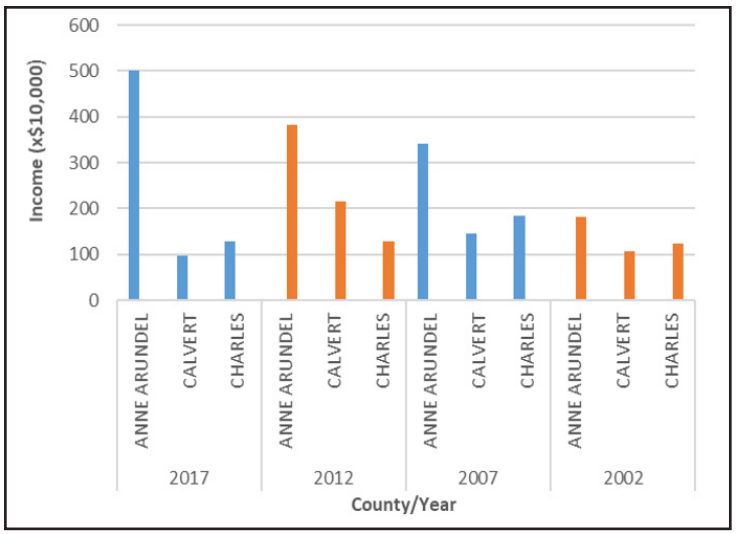


Figure 34a. Agritourism and Farm Recreational Income, Southern Maryland. Data Source: USDA

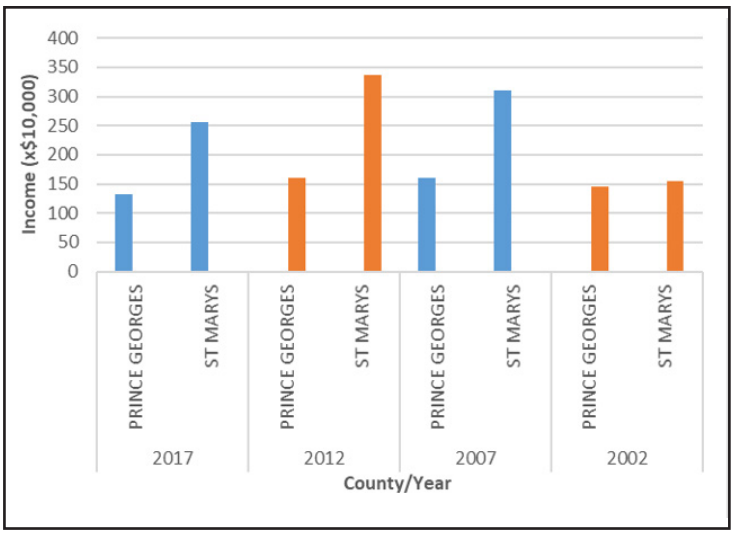


Figure 34b. Agritourism and Farm Recreational Income, Southern Maryland. Data Source: USDA

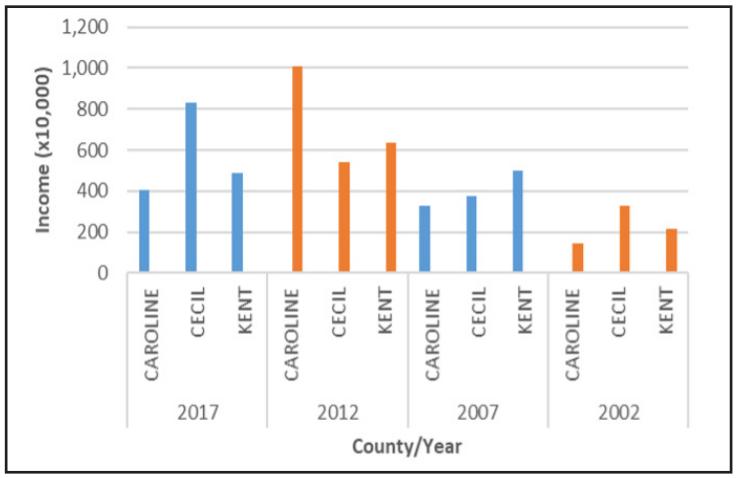


Figure 35a. Agritourism and Farm Recreational Income. Upper Eastern Shore, Maryland. Data Source: USDA

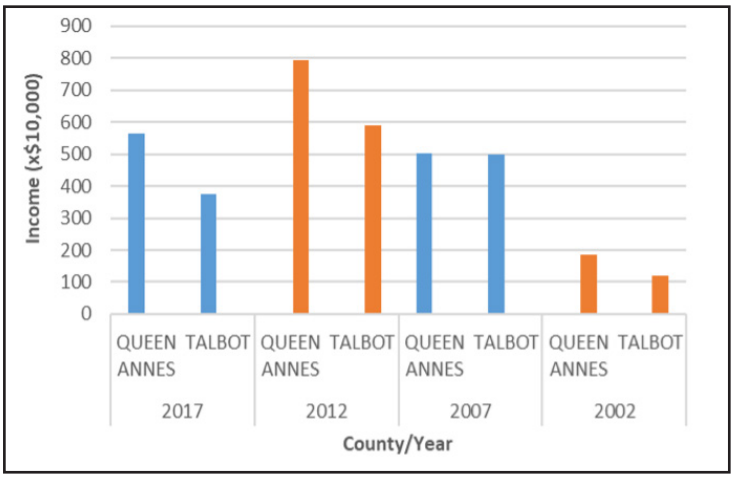


Figure 35b. Agritourism and Farm Recreational Income, Upper Eastern Shore, Maryland. Data Source: USDA

Southern Maryland Agritourism Income

Figures 34a and 34b describe the income earned by farm-related agritourism and recreational businesses between 2002 and 2017. Anne Arundel was the top agritourism income earner among the counties in southern Maryland. Anne Arundel's income from agritourism from 2007 to 2017 was only about 30% of the earnings of Frederick County, the top earner in the north-central region. Comparing 2012 and 2017, agritourism income in Anne Arundel increased by 270%, from $1,810,000 to $5,000,000. There were intermittent increases and declines in agritourism incomes in the four other counties in the region over the 15 years. For instance, the income of Calvert County, which was $2,160,000 in 2012, declined by 55.5% to $960,000 in 2017. Similarly, in St. Mary's County, farm-related agritourism income declined 24%, from $3,370,000 to $2,560,000.

Upper Eastern Shore Agritourism Income

Figures 35a and 35b show agritourism incomes in the upper eastern shore of Maryland from 2002 to 2017. Agritourism income in this region changed considerably over the 15 years. Agritourism income in this region was highest in 2012. The top-earning counties were Caroline ($1,011,000) and Queen Anne's ($7,950,000). In 2017, agritourism income decreased by 60% in Caroline County and 29% in Queen Anne's County. In 2012, Talbot County accounted for 11.8% of income earned from agritourism. The share of Talbot's income in the total increased to 14% in 2017. As in southern Maryland, income from agritourism has been unsteady.

There was, generally, no discernable agritourism income trend among the counties in the upper eastern shore. However, Cecil County witnessed a steady increase in agritourism income, totaling about 60% from 2012 to 2017.

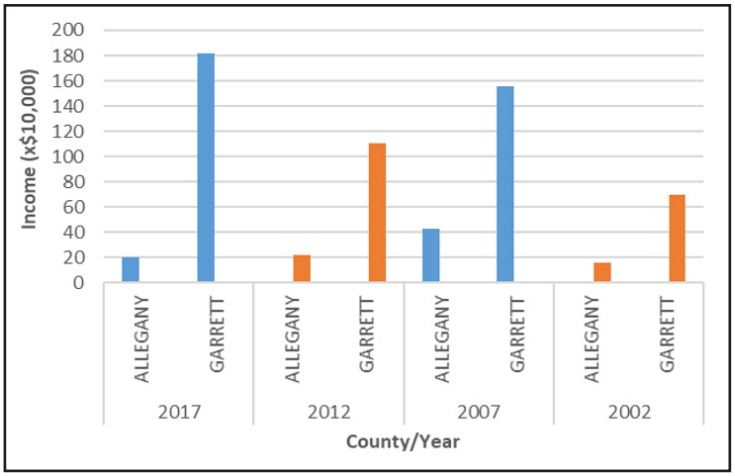


Figure 36. Agritourism and Farm Recreational Income, Western Maryland. Data Source: USDA

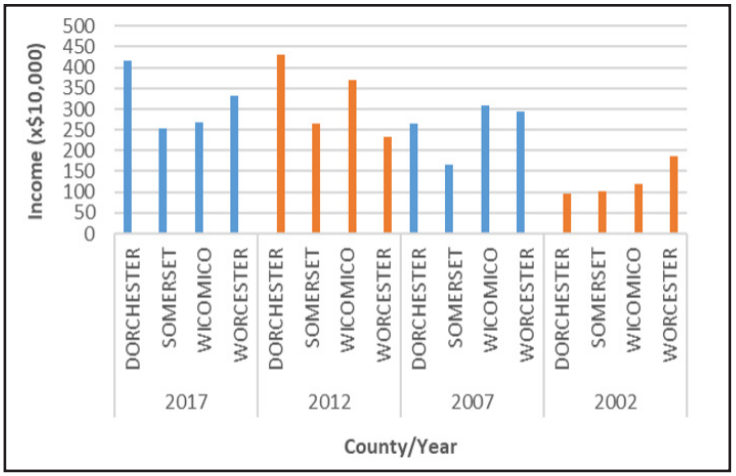


Figure 37. Agritourism and Farm Recreational Income, Lower Eastern Shore, Maryland. Data Source: USDA

Western Maryland Agritourism Income

Agritourism in western Maryland recorded the lowest income among all the five regions in Maryland (Figure 36). We examined data from two counties, Garret and Alleghany. Agritourism in Garret County increased by 160% from 2002 to 2017. This income dipped in 2012 and resurged five years later in 2017. Agritourism income in Alleghany County was much less predictable. Alleghany County agritourism earned $160,000 in 2002, $430,000 in 2007, and declined to $200,000 in 2017. The income appears to be consistent with the low number of agritourism locations in Alleghany.

Lower Eastern Shore Agritourism Income

Figure 37 shows the trend of agritourism income from 2002 to 2017 in the lower eastern shore. In 2002, Dorchester County recorded the lowest agritourism income of the four counties in the region. Dorchester's agritourism income was 18.8% of the total in 2002, but this increased to 25.6% in 2007 and to 32.8% in 2017. Income earned from agritourism recreational services generally increased between 2012 and 2017 in all the counties on the lower eastern shore. Wicomico and Worcester counties have followed closely behind Dorchester. In 2017, Worcester accounted for 26% of total agritourism income, behind Dorchester County.

MOTIVATIONS AND BENEFITS

The benefits of agritourism are both economic and non-economic. These benefits include improving the standard of living of farm families, educating, and creating public awareness about agricultural produce and the location of providers of agricultural-related leisure; in this way, agritourism creates new customers for related food and leisure industries (Tew & Barbieri, 2012). Agritourism benefits have been related to the attributes of farm businesses and households –providing good indicators for the formulation of entrepreneurial development policies and promotional messages (Tew & Barbieri, 2012).

Following Weber's theory of formal and substantive rationality, agritourism is seen to compel formal (economic) motivations and substantive (sociocultural) motivations. Factors that have been found to affect motivations for providing the agritourism services described in the preceding pages include size of land, dependence on farming as a source of living, and assessment of the popularity of agritourism (McGehee & Kim, 2004). In a study to predict the attitudes of rural residents toward tourism, it was shown that attitudes were better predicted by community dependence on tourism compared with personal characteristics of individual members of the community (McGehee & Andereck, 2004).

Agricultural businesses diversify to farm/ranch agritourism in response to social, economic, and other external influences. The primary motivation for agritourism arises from increasing financial stress on farming families, which necessitates the search for an alternative source of income outside the confines of traditional agricultural practices (Nickerson et al., 2001).

In a survey of reasons behind farm/ranch diversifications to agritourism, Nickerson et al. found that 61% diversified for economic reasons and 23% for external reasons, while about 16% diversified for a concert of external, economic, and social reasons.

Small-sized farmers, using the comparative advantage of their farm products or processes, their county's consumer base, and social and economic processes, can use agritourism to add value to their farms as services or products and earn additional income to sustain the business – thus keeping the agricultural land in production (Che et al., 2005). Thus, agritourism is applicable for the sustainability of small-sized family farms. It is noteworthy that in Michigan, for instance, agritourism providers have developed networks for sharing research, products, purchase linkages, referrals, and agritourism destination information. In this way, agritourism providers create sectoral cooperative groups and support to face competition from other providers of leisure and food services (Che et al., 2005).

NEED FOR EXTENSION EDUCATION

Extension education provides a platform to enhance the progress and sustainability of agritourism business in the State of Maryland. This pre-assessment identified the typology and spatial spread of the agritourism operators in the state. The pre-assessment is to be followed with a full assessment survey where stakeholders will be asked to complete questionnaires about needs, challenges, and motivations in agritourism. The needs for valid social, economic, technical, and policy-related information and education are evident. The implication is that extension education must be positioned as a key pathfinder in the evolution of the agritourism industry if it is to continue to flourish as a strategy for farmers in the state to augment their income and thus retain their land to maintain agricultural production. Aside from the requirement of in-depth information on their general farm profiles and the agritourism experience, it is also important to assemble information about the significance of agritourism beyond balancing the fluctuation in farm income or augmenting off-season farm income.

The primary constraint to agritourism is marketing, and not how to operate the farms. The issue of the viability of the farms per se is not part of the scope of the present report. It is assumed that the primary motivation of the stakeholders of agritourism enumerated in this report is to augment their income and thus retain their farm holdings. It follows, then, that agritourism businesses will also require coordinated networking systems and training in management and marketing protocols and techniques. Stakeholders will be prepared to join and access opportunities in agritourism organizations, chambers of commerce, farmers' unions, marketing associations, and related organizations. This is another area where UMES Agricultural Extension's education programs can play an important role in creating these synergies by disseminating information and opportunities.

Overcoming the challenges to agritourism development will require harnessing the strategies of extension education to change the conventional farm orientation to one that considers recreation and provides for the management of visiting tourists. Tested information and marketing products can be provided to overcome barriers posed by competitors, such as established leisure and alternative food purchase sources (see Che et al., 2005).

CONCLUSION

Drawing from previous studies in the United States and overseas, the intersections of location factors and agritourism in Maryland were examined. These factors include transportation access, proximity, population density, median income, natural amenities, and income from farm-related agritourism and recreational activities. The study segmented the state into five geographic regions, namely north-central, southern, lower eastern shore, western, and upper eastern shore. Further, the inquiry extended into the individual situations of county areas within each region. This analytic approach was adopted because differences in the structure and composition of the same factors that influence agritourism operations may exist between regions and counties. Some areas may have comparatively more advantages in distinct services (Bagi & Reeder, 2012). The spatial spread of the primary agritourism businesses in the State of Maryland is shared between metropolitan areas and within geographically isolated areas. Notwithstanding the individual proximity of the businesses to state and inter-state highways, each region competes and reflects its area's agricultural, environmental, demographic, and income comparative advantage.

It should be noted that agritourism has its pluses and minuses. On the plus side, it enhances farmers' income-earning capacity, which aids them in maintaining their landholdings and withstanding the vagaries of income fluctuation from product sales. Second, it enhances

farmers' capacity to fully utilize the farm resources and assets, provide additional employment opportunities, and increase the economic health of local communities. However, farmers have complained of potential liability issues, breach of privacy due to tourist visits, and the widespread impact on the natural ecosystem and its sustainability (Brown & Reader, 2007). These stress the need for education support for agritourism management and development, to potentially leverage the advantages inherent in the widespread diversification to agritourism among small- and medium-income farm enterprises.

However, as observed by Che et al. (2005), rural farms concentrate more on production and much less on marketing. It is noteworthy that Che et. al. underscored the importance of understanding marketing barriers that impede agritourism businesses from developing to their full potentials and limit their ability to adopt interdependent ways of doing business, like belonging to business networks and innovation groups. Also, they observed that rural tourism development has generally been limited by the lack of interpersonal skills. Increased alliances would create a competitive edge and a value chain for agritourism businesses in Maryland. Extension services education can enable these functions through information and marketing strategies that enhance the capacity of agritourism business in the state to tap into mutually beneficial cooperation, with its value-chain advantages. Compared to Virginia, Iowa, Kansas, and other agrarian states in the United States, the needs of agritourism stakeholders and providers in Maryland seem to have received much less attention – especially with regard to the assemblage of structural information required for the development of the educational and research prerequisites for agricultural extension services.

Based on the assumption that farm, place, and farmer characteristics would encourage agritourism diversification (Amanor-Boadu, 2013), this study will be followed by a stakeholder survey to, primarily, determine the requirements of agritourism stakeholders, including operators, extensions services, program managers, and policymakers, and to test the information so far gleaned from this baseline assessment. A survey of agritourism businesses in Maryland should provide ongoing data for the delivery of programmed information and education relevant to the development of agritourism in disadvantaged farming communities across the state by UMES Extension services.

REFERENCES

Altschuld, J. W., & Kumar, D. D. (2010). The needs assessment KIT—Book 1, needs assessment:An overview. Thousand Oaks, CA: SAGE Publications.

Amanor-Boadu, V. (2013). Diversification decisions in agriculture: The case of agritourism in Kansas. International Food and Agribusiness Management Review, 16(2), 57–74.

Ammirato S., & Felicetti, A. M. (2013). The potential of agritourism in revitalizing rural communities: Some empirical results. In L. M. Camarinha-Matos & R. J. Scherer (Eds) Collaborative systems for reindustrialization. PRO-VE 2013. IFIP Advances in Information and Communication Technology, 408. Springer, Berlin, Heidelberg.

Angima, S., Etuk, L., & King, D. (2014). Using needs assessment as a tool to strengthen funding proposals. Journal of Extension [On-line], 52(6) 6TOT1. http://www.joe.org/joe/2014december/tt1.php

Arroyo, C. G., Barbieri, C., & Rich, S. R. (2013). Defining agritourism: A comparative study of stakeholders' perceptions in Missouri and North Carolina. Tourism Management 37, 39–47.

Bagi, F. S., & Reeder, J. R. (2012). Factors affecting farmer participation in agritourism. Agriculture and Resource Economics Review, 41(2), 189–99.

Barbieri, C., & Mshenga, P. M. (2008). The role of the firm and owner characteristics on the performance of agritourism farms. Sociologia Ruralis, 48, 166–183.

Bernardo, D., Valentin, L., & Leatherman, J. (August 2004). Agritourism: If we build it, will they come? Risk and Profit Conference, 19–20, Manhattan, 1–16.

Brown, D. M., & Reeder, R. J. (2007). Farm based recreation: A statistical profile. United States Department of Agriculture Economic Research Service. Economic Research Report No. 53 (ERR-53). Washington, D.C.: USDA-ERS.

Butts, S., McGeorge, A., & Briedenhann, J. (2005). The great Cornish maize maze: Low risk, low cost, high yield. Culture and Agriculture, 27, 61–68.

Carpio, C. E., & Wohlgenant, M. K. (2008). The demand for agritourism in the United States. Journal of Agricultural and Resource Economics, 33(2), 254–269.

Caravella, J. (2006). A needs assessment method for extension educators. Journal of Extension. [On-line], 44(1) 1TOT2. http://www.joe.org/joe/2006february/tt2.php

Che, D., Veeck, A., & Veeck, G. (2005). Sustaining production and strengthening the agritourism product: Linkages among Michigan agritourism destination. Agriculture and Human Values, 22, 225–23.

Dill, S. P., Miller, J. O., McCoy, T., & Rhodes, J. L. (2017). Maryland eastern shore agriculture needs assessment. Journal of the NACAA, 10(1), 1–5.

Economic Research Service (August 2011). Farm household economics and well-Being: Farm household income. Washington, D.C.: USDA. http:/www.ers.usda.gov

Ellixson, A., & Taboor, K. (October 2016). Form generic liability waiver. Fillable form. University of Maryland Education Law Initiative. http://umaglaw.org/publications-library

ESRI (2010). Calculating service areas and creating an OD cost matrix. In Network Analysis Tutorial, pp. 42–58. ESRI, Redland California.

Figueiredo, O., Guimarães, P., & Woodward, D. (2002). Home-held advantage: Location decisions of Portuguese entrepreneurs. Journal of Urban Economics, 52, 341–361.

Harris, R. (2014). Agritourism is a growing industry in Virginia. Radio wvt. Virginia's Public Radio. https://www.wvtf.org/post/agri-tourism-growing-industry-virginia#stream/0

Helena, M. (2006). Research report: Searching for complementarities between agriculture and tourism – The demarcated wine-producing regions of northern Portugal. Tourism Economics, 12(1), 147–160.

Hogan, S. (2019). USDA census shows growth in agri-tourism, organics in Frederick County. https://www.fredericknewspost.com/news

Lucha, C., Ferreira, G., Walker, M., & Groover, G. (2019). A geographic analysis of agritourism in Virginia. Publication AAEC-62P. Virginia Cooperative Extension, Virginia Tech. www.ext.vt.edu

Philip, S., Hunter, C., & Blackstock, K. (2010). A typology for defining agritourism. Tourism Management 31, 754–758.

Roman, M., & Golnik, B. (2019). Current status and conditions for agritourism development in the Lombardy region. Bulgarian Journal of Agricultural Science, 25(1), 18–25.

Marrocu, E., & Raffaele, P. (2012). Different tourists to different destinations: Evidence from spatial interaction models. Working Paper. University of Cagliari, Cagliari, Italy.

Maryland Manual Online (2020). Maryland at a Glance: Agriculture. Maryland State Archives. https://msa.maryland.gov/msa/mdmanual/01glance/html/agri.html

MacCannell, D. (1973). Staged authenticity: Arrangements of social space in tourists settings. The American Journal of Sociology, 79, 589–603.

McGehee, N. G. (2007). An agritourism systems model: a Weberian perspective. Journal of Sustainable Tourism, 15, 111–124.

McGehee, N. G., & Kim, K. (2004). Motivation for agri-tourism entrepreneurship. Journal of Travel Research, 43(2), 161–170.

McGehee, N. G., & Andereck, K. L. (2004). Factors predicting rural residents' support of tourism. Journal of Travel Research, 43(2), 131–140.

Marques, H. (2006). Searching for complementarities between agriculture and tourism – The demarcated wine-producing regions of northern Portugal. Tourism Economics, 12, 147–155.

McIntosh, A., & Bonnemann, S. M. (2006). Willing workers on organic farms (WWOOF): The alternative farm stay experience? Journal of Sustainable Tourism, 14, 82–99.

NASS/USDA. (2010). Agricultural statistics. Washington, D.C.: United States Department of Agriculture.

Nickerson, N. P., Black, R. J., & McCool, S. F. (2001). Agritourism: Motivations behind farm/ranch business diversification. Journal of Travel Research, 40, 19–26.

Sarupia, E. (2005). Rethinking the role of transportation in tourism. Proceedings of the Eastern Asia Society for Transportation Studies, 5, 1767–1777.

Schilling, B., Marxen, L., Heinrich, H., & Brooks, F. (2006). The opportunity for agritourism industry development in New Jersey. Food Policy Institute Research Report RR-0706010, Rutgers, the State University of New Jersey.

Sloagett G., & Woods, M. D. (2003). Critical factors in attracting new business and industry in Oklahoma. Oklahoma Cooperative Extension Fact Sheets, AGEC-862. http://osufacts.okstate.edu

Suri, M. R. (August 2016). Opening a distillery: Legal details that producers need to know. Fact Sheet, FS-1051. University of Maryland Education Law Initiative. http://umaglaw.org/publications-library

Suri, M. R. (April 2015). Microbreweries and the new Class 8 Farm Brewery License. Fact Sheet. University of Maryland Education Law Initiative. http://umaglaw.org/publications-library

Tew, C., & Barbieri, C. (2012). The perceived benefits of agritourism: The provider's perspective. Tourism Management, 33(1), 215–224.

Anonymous. (2016). Economic impact of tourism in Maryland. Tourism Satellite Account Calendar Year 2016 Analysis. Tourism Economics. Available at: https://www.visitmaryland.org/sites/default/files/2021-09/MD-Visitor-Economic-Impact-20161.pdf

Anonymous. (2018). Economic impact of tourism in Maryland. Calendar Year 2018 Available at: https://www.visitmaryland.org/sites/default/files/2021-09/Economic-Impact-of-Tourism-in-Maryland-2018-State1.pdf

National Agriculture Statistics Service [NASS] (2007). United States Department of Agriculture [USDA]. 2007 census of agriculture: U.S. state level data.

Whitt, C., Low, S.A., & Van Sandt, S. (November 2019). Agritourism allows farms to diversify and has potential benefits for rural communities. Rural Economy and Population. Economic Research Service, United States Department of Agriculture. https://www.ers.usda.gov/amber-waves/2019/november/

APPENDIXES

[A] Attached – List of Agritourism Facilities in Maryland, With Addresses

[B] Codes and Expansions of Agritourism Services Used in This Report

Name	Code	Name	Code
Farmers' Market	FM	Alpaca Farm	AF
Winery	WN	Farm Stay B&B	FST
Craft Brewery	CB	Roadside Stand	RSS
Creamery	CR	Garden Center	GC
Corn Maze	CM	Artists' Market	AM
Petting Zoo	PZ	Tasting House	TH
Hayride	HR	Farm Festival	FES
Restaurant	RT	Seafood Crab and Clams Festival	SF
Farm Store/Stand	FS	Horse Show	CF
U-Pick	UP	Oyster Farm	HS
Fruit Market	FR	Wine Tasting	OYF
Farm Museum	FMS	Taproom	WT
Alpaca Farm	AF	Apiary	TAR
Organic Farm	OF	Heritage	AP
Farm Tour	FT	Farm Camp	HG
Horseback Riding	HRD	Pumpkin Patch	FC
Teaching Farm	TF	Flower Farm	PP
Gift Shop	GS	Tree Farm	FF
			TRF

This publication, Maryland Agritourism: A Baseline Profile, is produced by the University of Maryland Eastern Shore Extension within the School of Agricultural and Natural Sciences.

AUTHORS:

- Kingsley U. Ejiogu, Ph.D. Associate Professor, University of Maryland Eastern Shore
- E. Nelson Escobar, Ph.D., Associate Dean and Associate Administrator for Extension, Associate Professor and Small Ruminant Extension Specialist, University of Maryland Eastern Shore
- Moses T. Kairo, Ph.D., Dean of the School of Agricultural and Natural Sciences, University of Maryland Eastern Shore

COLLABORATOR:

- Luis Peña-Lévano, Ph.D., Assistant Professor, Agricultural Economics, University of Wisconsin-River Falls

FOR CITATION OF THIS PUBLICATION:

Ejiogu, K.U., E.N. Escobar, M. Kairo. 2023. Maryland Agritourism: A Baseline Profile. UMES Extension, University of Maryland Eastern Shore, Princess Anne, MD 21853. www.umes.edu/extension

This work was supported in part by the U.S. Department of Agriculture, National Institute of Food and Agriculture, and in partnership with the Maryland Legislature.

UNIVERSITY OF MARYLAND
EASTERN SHORE
UMES EXTENSION

SCAN TO LEARN MORE ABOUT
UMES EXTENSION