Improving Localized Agricultural Supply-Chains in the Commonwealth of Virginia

Applied Policy Project

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May 2024

Virginia Department of Agriculture and Consumer Services

University of Virginia
Frank Batten School of Leadership and Public Policy

Acknowledgements

I would like to thank Professor Gerard Robinson of the Batten School of Leadership and Public Policy for his assistance in completing this project. I am also grateful to Deputy Secretary of Agriculture and Forestry Travis Rickman for his willingness to work with me over the course this year as I completed this project.

Honor Statement

On my honor as a student, I have neither given nor received unauthorized aid on this assignment.

Disclaimer

The author conducted this study as part of the program of professional education at the Frank Batten School of Leadership and Public Policy, University of Virginia. This paper is submitted in partial fulfillment of the course requirements for the Master of Public Policy degree. The judgments and conclusions are solely those of the author, and are not necessarily endorsed by the Batten School, by the University of Virginia, or by any other agency.

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Executive Summary

This policy report seeks to address key issues in local agricultural information sharing capabilities for farmers in Virginia, specifically through the platform Market Makers. This report begins by demonstrating the concurrent support and interest from the Biden Administration at the federal level through USDA in supply-chain improving policy action. Next, the background of the policy area is examined. Scoping out the facts of agriculture in Virginia, the massive role that the industry of agriculture plays in driving forward and contributing to prosperity is established. Building up this basis, the influence and capability of the Virginia Department of Agriculture to create and implement policy in this area is discussed. Accounting for key stakeholders and authorities, the support that Governor Glenn Youngkin has demonstrated for innovative and empowering agriculture is also outlined.

From here, the focus is drawn on small to middle sized farms. This is due to the fact that these types of farmers are extremely prevalent in Virginia, as well as the reality that they face the most adverse effects from information sharing and market barriers. Rising farm debt and troubling economic agricultural conditions construct the case for policy action to assist these smaller sized farms who experience magnified effects of supply-chain disruption. Seeking an addressable and actionable policy opportunity, Market Makers, a buyer to seller connection platform, is primarily centered on. This platform, created in partnership with the Virginia Tech College of Agriculture and Life Sciences, retains the potential to help ameliorate some of the information and market issues faced by smaller farm operations (Virginia Market Maker, 2022). Yet, this platform is crippled by rampant underutilization. The remainder of the report investigates ways to remediate this failure and foster productive levels of enrollment.

Four possible policy alternatives are considered:

1. A Large-scale Information Campaign
2. Farm Workshop Training
3. Subsidized Enrollment and Use
4. Automatic Opt-In policy in Conjunction with a USDA Certification.

Each of these alternatives is examined thoroughly, first from a literature review perspective and then evaluated according to projected findings. A large-scale information campaign has shown promise in influencing individuals' behavior under certain conditions, but faces challenges in terms of timing and reaching the right audience. On top of this, research does not conclusively point towards this sort of information campaign having a sustained effect on platform enrollment. Training conducted at farmer workshops, on the other hand, holds much promise in terms of effective stakeholder engagement. Outlined research shows that face-to-face interactions of farmers proves very effective in influencing behavior. Yet, these workshop efforts face large obstacles when considering the resources required and the administrative coordination effort necessary for execution. Next, subsidizing farmers to enroll and utilize the platform projects to significantly increase enrollment and usage of the platform. A major difficulty, however, would be setting the subsidy to the right amount in order to limit unnecessary expenditures. On top of issues with discerning farmer preferences, a subsidy simply poses too much of a cost for the Virginia Department of Agriculture to reasonably consider. Even when designed to phase out in three years, the number of farmers in Virginia necessitate a program to be funded for up to $9 million.

The final policy option considered is constructing an automatic opt-in enrollment paired with farmers applying for the USDA Certified Organic designation in Virginia. Using a research-backed method of nudging farmers into usage, this alternative holds promise in stimulating Market Makers without entailing high costs or administrative burdens. Using three comparative criteria, Effectiveness, Cost, and Administrative Feasibility, the **Automatic Opt-in policy option is selected as the best course of action.**

Moving this alternative into implementation would require coordinating with the USDA for support and approval to avoid legal challenges arising. Constructing an automatic reminder system to keep farmers informed about their platform membership would also be necessary. The recommendation of this policy memo is taking this innovative policy action to strengthen the existing agriculture market and address existing shortcomings to better serve the citizens of the Commonwealth of Virginia.

Introduction

On November 27, 2023, President Biden's Administration conducted the inaugural meeting of the White House Council on Supply Chain Resilience. Lead by U.S. Department of Agriculture (USDA) Secretary Tom Vilsack, the administration enumerated a few guiding priorities aimed at shaping the future of agriculture policy. Vilsack announced that policy action should resemble "Investments in agricultural producers and rural entrepreneurs (that) will create better economic opportunities that bolster food supply chains across the country and increase competition" (USDA, 2023). Altogether, the Biden-Harris Administration believes that agricultural focused supply-chain policies have the opportunity to generate lower market prices and diversify the choices facing consumers without undermining the profitability of farmers.

Translating these lofty aims into direct policy solutions may be challenging, but the agricultural situation in Virginia provides the opportunity to do so. Narrowing the administration's nationwide focus on supply-chain issues to farmers in the Commonwealth, this Biden Administrative directive creates a window of opportunity and strong support from the federal level for innovative policy action. This policy analysis, although focused on an information sharing platform, Market Makers, is not merely addressing a communications challenge. Rather, this analysis is attempting to generate a creative solution to the information barrier farmers face that are contributing to inefficient and incomplete agricultural supply-chains. Policy action in Virginia can contribute to this nationwide transformation effort, providing success as well as lessons learned. This policy report will attempt to put agricultural supply chain issues into a practical Virginian context, walking through key issues and evaluations of possible solutions. Weighing policy measures and considering stakeholder responses will illuminate the agricultural situation in Virginia and can act further as a guide for other closely related policy action.

Background

Comparative Scale

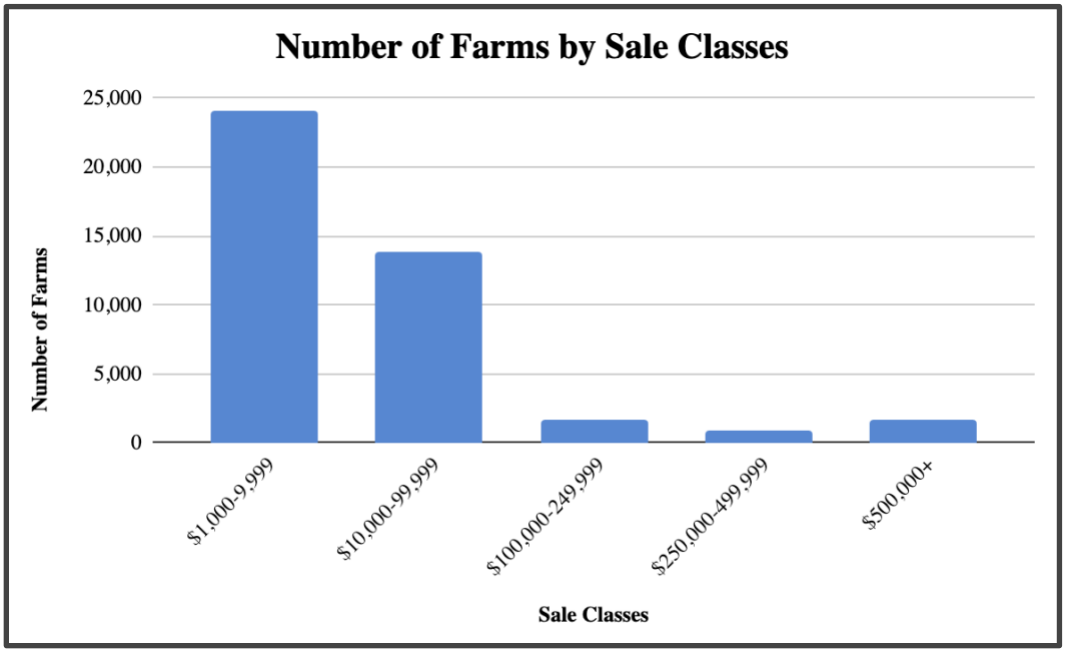
In Virginia, Agriculture is the largest private industry and has an economic impact of $82.3 billion yearly (VDACS, 2022). More than 381,800 jobs are provided by the industry, which produces many Virginia commodities that are top ranked nationally (VDACS, 2022). Virginia also exports to foreign nations, exporting more than $1.45 billion in agricultural products to China in 2022 (VDACS, 2022). Across the state, 41,500 different farm operations span 7.7 million acres (VDACS, 2022). Among these, there are nearly 19,000 first-time farmers (VDACS, 2022). The supply chain from farm to market does exist. Around 16 cents of every consumer dollar spent on agricultural products ends up back with the farmer (VDACS, 2022). As a way of distinguishing top products, if a commodity end product is made from Virginia grown products it is branded “Virginia Finest” at market. Most states conduct a branding program like this to help distinguish local commodities and increase the demand for local agricultural goods and services. Approximately 1,100 new agriculture and forestry jobs (2%) have been added in Virginia since 2017 (VDACS, 2022). These industries considered together represent 9.3% of Virginia’s GDP (VDACS, 2022).

It is important to consider specific trends within the agricultural sector. From 2009 to 2014 real farm cash receipts increased by 40%, fell 20% from 2014 to 2016 due to rising commodity prices, and decreased by 1% from 2016 to 2021 (Agriculture and Forestry, 2022). Farm acreage also shrunk from around 8.1 million acres in 2014 to 7.7 million acres in 2021 (Agriculture and Forestry, 2022). Even amidst this shrinkage, the total economic impact of the Agricultural industry has grown. Combined with Forestry, the total value-added impact grew $5 billion dollars from 2016 to 2021 in terms of 2021 real dollars (Agriculture and Forestry, 2022). The growth of the Agricultural sector is accompanied by growth in closely related business. For instance, alcohol beverage manufacturing in Virginia has grown by 22% over the last 5 years, an industry that heavily purchases Virginia grown agricultural products. With such a high potential for growth, it is more important than ever that resources are devoted to building more robust localized supply chains.

Local Supply Chains Technical Findings

Over the past 20 years, there has been an emergence of mid-scale marketing channels that directly connect buyers and sellers. These have been termed value-based supply chains (VBSCs). One of the main components of a VBSC is that it allows for small and mid-sized farms to survive while also fostering growth to meet increasing market demand. Small and mid-sized firms ($50,000 and $500,000 in gross sales) are often referred to as "agriculture of the middle", or AOTM (Peterson, 2022; Feenstra, 2016). Because the agriculture market is primarily a wholesale market, smaller farms may face challenges conducting reliable and sustainable product sales (Peterson, 2022).

Figure 1 (USDA, 2020)



Contextualizing the aforementioned challenges faced by small to middle sized farms, **Figure 1** clearly demonstrates the number of farmers who fall into these lower spend categories. Nearly all of these farms are within the size defined for AOTM, indicating some elements of a VBSC that would prove useful in application in Virginia. Furthermore, analyzing VBSCs development in Virginia seems to directly align with the client's expressed interest. Based on the challenges AOTM faces, a working hypothesis is that many of the farmers the client wants to

better serve fall into this category. A focus on VBSC and its components provides a potential path towards recommendations.

A 2021 study sought farmers' opinions, specifically from those who participate in VBSCs. Figuring out whether farmers, especially AOTM, actually desired and utilized VBSCs was the primary driver of this study. In the end, researchers found that VBSCs have already become a core asset to both small and large farms (Peterson, 2022). For instance, small farms were the most likely to list VBSCs to be one of the top three marketing channels their business utilizes and to have a higher percentage of sales through VBSCs (Peterson, 2022). These findings provide initial promise that VBSCs do in fact provide a key function for small farms.

Identifying a VBSC's key features connects existing research to the scope of this policy project. One of the main natural drivers of VBSC's formation is the provision of previously unavailable or costly market information. This can take the form of unclear transportation requirements and availability, difficulty connecting with stores to sell commodities, or lack of established business relationships. These barriers exist to both the buyer and seller (Feenstra, 2016). From this point, considering research on information provision techniques becomes extremely relevant. A case study from Italy provides useful insights into how the growth of local supply yields both market improvements and increases in sustainability. Researchers set out to examine farmers who are directly involved in Short Food Supply Chains (SFSCs). As defined by the researchers, a SFSC is a market with geographically closer buyers and sellers with only a few intermediaries (Mastronardi, 2015). This definition highly resembles the emerging VBSCs in the United States. The researchers found through random sampling of agriculture producers across various types of farm arrangements that farms which were directly involved with established SFSCs demonstrated more sustainable practices (Mastronardi, 2015). From decreased search time to more efficient transportation, more climate friendly practices formed. When farmers do not have adequate information or access to information hubs of buyers and sellers, they may often engage in less efficient and less sustainable processes to get their products to the market. This conclusion is a strong factor to weigh as the policy project moves forward. Enacting more sustainable market practices empowers other climate friendly agricultural initiatives to have maximum effect.

Next, a study in 2015 about specifically vegetable supply chains in China provides insight into information sharing strategies. The context of this research was specifically the relationship between farmers and vendors on a smaller scale, mirroring some of the core definitions of a VBSC. As the world's largest vegetable producer, information systems play a key role in maximizing efficiency (Zhong, 2015). If farmers are aware of consistent vendors and demand for crops and efficient transportation techniques, the agriculture system as a whole becomes more efficient. Previous to the construction of a central information system, many of these farmers struggled to get their crops to market. Over the course of the last two decades, an information system has slowly been developing. The researchers found, however, support amongst farmers for creating a more extensive database and that the central gathering of information would better maximize existing agricultural systems (Zhong, 2015). This study into farmers favoring the creation of a better buyer/seller database ties directly with positions put forth by the client. This led to the scoping of the problem statement specifically to examining the enrollment and use of Market Makers.

Level of Government

As mentioned before, the Virginia Department of Agriculture retains primary jurisdiction and influence over the scope of the problem selected. Other divisions of the Virginia Governor's Office could also share interest and retain relevance in any attempted policy measures. Examples of this would be the Office of Transformation, Department of Commerce and Trade, and Department of Finance. Should a large-scale policy intervention be determined, these other departments could prove meaningful contributors where necessary to implementation. Ultimately, the USDA does also play a significant role in shaping agriculture regulation across the United States. States can have unique agriculture rules and legislation, but ultimately the core outline from the USDA shapes agriculture across all U.S. states. For any rule or legislation modification brought forth by the policy analysis, the scope will be focused on changes that are under the purview and authority of the Virginia Department of agriculture. While some viable policy alternatives could necessitate changes by the USDA, the feasibility of such policy action would be much lower than focusing specifically on the state level.

Recent Developments

Considering the political salience of the issue, agriculture has the attention of Governor Glenn Youngkin. In his 2023 budget amendments, there is an additional $1.25 million provided in fiscal years 2023 and 2024 to advance the agricultural sector, especially high-tech developments (Curry, 2023). The Governor has signed several pieces of legislation during his time in office aimed at fostering agricultural growth. When discussing his legislative priorities, Governor Youngkin stated, "innovation is critical to creating a resilient food system that prevents a rapidly growing world population from suffering food insecurity, while responding to consumer demand for healthier, more sustainable food options" (Youngkin, 2023). The governor's focus on agricultural development, as well as the lack of substantial controversy surrounding improving Virginia's agriculture provides a positive prognosis on political feasibility and importance. The challenges faced in creating efficient agricultural supply chains to markets locally and domestically also have national attention. Congresswoman Abigail Spanberger of Virginia's 7th district recently introduced bipartisan legislation to create supply chain regional resource centers (Spanberger, 2022). Much political focus and bipartisan grounds exist in this issue.

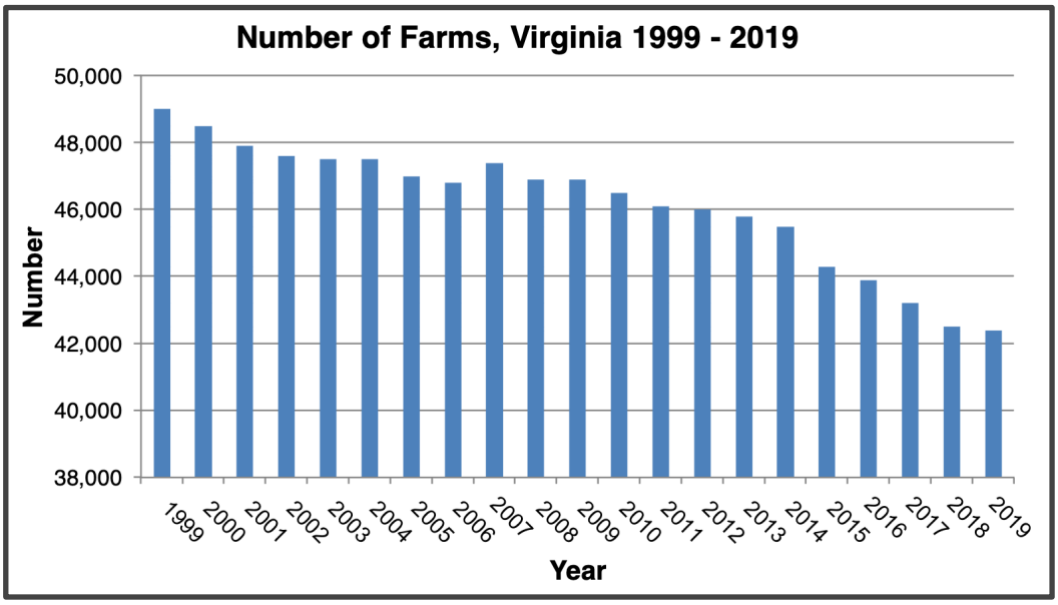
One step towards addressing these challenges has been the Resilient Food Systems Infrastructure Program Cooperative Agreement (RFSI). The Virginia Department of Agriculture and Forestry (VDACS) has entered an agreement with the U.S. Department of Agriculture to work toward resilience within the existing food supply chain (VDACS, 2022). According to the agreement itself, the USDA "Funds will support expanded capacity for the aggregation, processing, manufacturing, storing, transporting, wholesaling, and distribution of locally and regionally produced food products, including specialty crops, dairy, grains for human consumption, aquaculture, and other food products, excluding meat and poultry" (VDACS, 2022).

Anticipating Technological Developments

There are certain changes that could occur that undermine the robustness of the analysis. For instance, if the USDA decided to create a new central platform to assist farmers, the emphasis on Market Makers and a regional solution could be obsolete. Also, in the next few years farmers may see a dramatic increase in information gathering tools available at their disposal. One of these may be readily available artificial intelligence programs. While currently the most effective and advanced AIs are available only to very few companies, it is reasonable to assume eventually AI programs will be easily accessible to farmers. The potential of tools like this for maximizing logistics and gathering information could exceed the usefulness of any existing resource. As of now, however, these tools are still far from development. Additionally, many of the farmers with the greatest need for improvement in information and market techniques may be those with less capabilities or financial abilities to acquire and utilize these advanced tools. With these concerns in mind, it is unlikely for the foreseeable future that technological change will occur to the extent that it invalidates policy action to improve Market Makers. Furthermore, policy action to improve this information platform enables a more efficient incorporation of advanced tools in the future. As a result, the state of technology and platform development will be held constant in this analysis.

Problem Significance

Figure 2: (USDA, 2020)



In terms of considering this problem's significance, Virginians who are currently disadvantaged are of primary focus. First, farmers with less resources and financial backing face greater challenges than larger, wealthier farms. This could be exhibited in greater difficulties in connecting to markets for their products, information barriers, and coordination issues. The effects of these obstacles are becoming increasingly evident over the last 20 years in Virginia. One component of the market consolidation seen in **Figure 2** are the small firms leaving the market because of the aforementioned issues faced. Other factors, such as increasing productivity of farm size and farmland development are certainly relevant. Nevertheless, the decreasing number of farms is ultimately conveying a story of decline in Virginia, with small to middle sized farmers facing greater roadblocks than potential market functioning.

The second vulnerability to consider is the end result of the products, considering who has access to fresh Virginia products and who does not. Often, these farm products are the ones most excluded for low income and minority groups in food deserts, a problem addressed most recently by the Youngkin Administration in Petersburg (Virginia Cooperative Extension, 2020). Virginia does have a food distribution program that manages the U.S. Department of Agriculture's (USDA) food donations and grants (VDACS, 2022). This program both supports

the agricultural industry and assists around 500 public and private partners throughout Virginia (VDACS, 2022).

Decreasing prices for products and increasing farm debt are both contributing factors to challenges faced by farmers (Kennedy, 2022). These financial challenges both make it more difficult for farmers to get their products to a range of markets but also make it more important than ever to address supply chain challenges. The state government did create a website to better match consumers to producers called Market Maker, but this system currently experiences very low usage. This policy analysis is intended to consider this existing program that is seemingly failing to function to their full capacity.

Problem Statement

A recent United States Department of Agriculture (USDA) analysis on Agri-Food Supply Chains in America found that the “provision of timely economic information and market news and intelligence” is a top agricultural area in need of policy action. (USDA, 2022). With less than 8% of Virginia farmers using Market Makers, Virginia's primary central grower-to-buyer platform, there is too little information sharing and networking, putting small to middle sized farmers at a severe disadvantage (Marketmakers; Virginia Dept of Ag., 2021).

Client Overview

The client for this research project is the Virginia Department of Agriculture and Consumer Services (VDACS). Specifically, the point of contact is Deputy Secretary Travis Rickman. In initial conversations with him, the underutilization of Market Makers was a clear concern of his. For the client, there are two clear objectives with this project. First, a clear win would be receiving actionable insight into the usefulness of a system like Market Makers. Information validating the efforts and resources that would be poured into this project is necessary. The second key objective is the provision of an informed policy option to directly foster this platform’s growth and expansion. The Department of Agriculture is interested in empowering every Virginia farmer and currently would like to make specific efforts to protect and grow the most vulnerable growers. In this case, the small to middle sized farmers would benefit the most from a high functioning, thriving platform providing connection across the agricultural market.

Alternatives Literature Review

Alternative #1: Large-scale Information Campaign

An initial policy alternative to consider would be devoting resources to a mass marketing campaign to spread awareness and promote the Market Makers platform. This alternative could consist of creating and spreading advertisements, flyers, and brochures, and even promoting the program on relevant media. Any hindrance to farmers on joining Market Makers based on a lack of information about the site would be addressed by this policy option.

Research has shown that under certain conditions, PSAs, or public service announcements, can be effective in getting individuals to change their behavior in the short term (Reidenberg, 2022). Studies have also been done on how information campaigns can change the way that individuals see different services or provisions. For instance, researchers found that PSAs were able to decrease stigma around using health resources and foster more participation (Corrigan, 2015). Although differing in application, this confirmation is significant because the Department of Agriculture has to change the way individuals are viewing Market Makers currently. Further research has shown what can make an information campaign successful. A major takeaway of a study into PSA effectiveness was that the most effective announcements are quantitative based, relying on data from focus groups and other assessment methods (Nolan, 2009). This type of research should be factored into this alternative's implementation. A final insight from existing research regards who can make the best spokesperson in information campaigns. Rather than a celebrity, researchers found that the most compelling spokespeople were individuals directly involved in the situations (Toncar, 2007). In this case, featuring real farmers using Market Makers already could prove effective.

A potential challenge that could arise for an information campaign effort is ensuring the spreading of information to the targeted audience, meaning the farmers who are not yet on Market Makers and have not heard of it. Farmers that would be most exposed to new agricultural information efforts may already be aware of the site and not alter their behavior. Farmers who are not on Market Makers receive their information from other sources. Identifying these other sources, such as for-profit agriculture sites, would be a key part of staging an effective information campaign. An additional concern is regarding the timeline of these efforts.

Determining how long this information campaign should continue and when the gains will be realized may be difficult to anticipate. Finally, merely advertising and promoting the platform may not convey legitimacy of the state created site. Since the platform has existed for a few years and has been promoted previously, there may be concerns that this alternative would not address any underlying obstacles.

Alternative #2: Farm Workshop Training

A further policy alternative is to incorporate Market Makers training and promotion into existing skills workshops to equip and assist small to middle sized farmers. In these sessions, along with other information, farmers would have the opportunity to hear more about Market Makers and would be encouraged to utilize the site. An advantage of this alternative would be any way it is able to use pre-existing policies. An example of this would be partnering with the Virginia Cooperative Extension's Small Farm Outreach Program (VCE).

Weighing the merits of these types of programs, researchers have found that cooperative workshops can affect farmers' behavior. For instance, when comparing several information dissemination methods about crop procedures, the face-to-face encounters that farmers had in workshops proved meaningful to convince them to alter their behavior (Bentley, 2007). For this policy alternative, farmers seeing other farmers are joining would greatly strengthen enrollment efforts. In terms of how workshops can prove effective in the agricultural space, research has also shown that interactive workshops can promote positive attitudes and engagement among farmers (Alif, 2024). Beyond the studied effects of in-person workshops, there also has been research into online provision of training. Specifically, in response to the moving online of workshops during the COVID-19 pandemic, researchers discovered that online training for farmers can be both useful and sustainable (Stopniece, 2023). This conclusion aligns with other research that has found that farmers working together online are able to foster the growth of useful human capital, learning new techniques and skills for application (Warren, 2004).

There are a few concerns that could stand in the way of this policy alternative. First, there are limits to the existing workshops in terms of both location and size. Challenges in terms of having the capacity for more farmers to attend, as well as compelling these farmers to participate certainly arise. Also, the farmers who possess the initiative for attending these workshops may already be on the Market Makers platform. If the targeted potential enrollees will not attend these

workshops anyway, this alternative is severely undermined. Additionally, these types of workshops occur at different times across the Commonwealth. Part of the appeal to users is a large influx of other participants who add value to the platform. Without a coordinated policy, the initial workshop participants could find it less compelling to join Market Makers.

Alternative #3: Subsidize Enrollment and Use

Another policy alternative being considered as a method to increase the vitality of the site Market Makers is subsidizing farmers to join and use the platform. A key factor of this policy option would be providing the subsidy as a yearly payment to all qualifying farmers. Each year, farmers would be verified for their usage of the platform and subsequently receive a small financial compensation.

Research suggests that a subsidy could prove effective in increasing membership under the correct conditions. Specifically, when investigating how public subsidizing of union membership influences union membership rates, researchers found a clear boost in rates responding to the subsidy (Barth, 2020). Concerns may arise, however, when considering how the provision of a subsidy affects individuals' attitudes towards policies. Examining how energy subsidies affect the attitudes of consumers, researchers found that subsidies actually decreased the feelings of environmental responsibility of consumers (Hong, 2019). One reason may be that when an action is assigned a monetary value, it undermines the desire to do the task out of a sense of goodwill or responsibility. Gleaning this conclusion, it would be important to consider how the subsidy would affect farmers' attitudes towards the program before moving forward with a policy.

Moving to agricultural specific research, investigating the effect of crop specific subsidies in East Africa found that subsidies can strengthen community resilience (Fujimoto, 2024). Specifically, providing individual subsidies to farmers was effective in strengthening relationships and diversity of agricultural systems. Other research being done found that in China agricultural subsidies, when paired with the establishment of cooperative programs, holds great promise for fostering farmer-to-farmer interactions (Zhang, 2019). Opposed to earlier work evaluating the two programs as separate policies, these researchers found that farmers who received the subsidy more positively viewed and engaged with the collaboration programs.

Although the agricultural setting of this study differs greatly from that of Virginia, the implications of fostering engagement with other farmers is significant.

Obstacles that this policy alternative could face is the cost of the program and unknown preferences of farmers. With over 41,000 farmers in Virginia, this policy alternative resembles a substantial cost for the Department of Agriculture (VDACS, 2021). At $100 per farm, the program poses up to $4.1 million in potential cost at the most extreme. Yet, the subsidy would not be designed to get every farmer to join, but the ones most willing to join. Theoretically, these would be the small to middle sized farms, the target population. Once enough farmers were using the platform and the network benefits were realized, the subsidy could likely be reduced or absolved without undermining the functioning of the platform. The balance this policy would have to find would be providing enough of a subsidy to convince the optimal number of farmers to join, but not too much of a payment that unnecessary costs are levied on the department of agriculture.

Alternative #4: Automatic Opt-In

A final policy alternative to be considered is nudging farmers to use Market Makers with automatically opting them into the program. Currently, if farmers would like to participate in the platform, they must on their own apply and enroll in the system. This policy option would automatically enroll all registered farmers in the system to jumpstart the usage of the platform. Virginia requires farmers to have different licensing depending on what exactly they are producing. An example of this is becoming USDA Certified Organic through the Commonwealth (VDACS, 2023). For this alternative, farmers would be automatically registered on Market Makers when they receive their agricultural licensing. This opting in could greatly increase usage of the platform and yield large network effects for farmers. A further recommended component of this policy would feature regular notifications sent to farmers about their enrollment in the platform and encourage their use of it. A potential more aggressive policy feature would be charging an opt out fee to any farmers wanting to leave Market Makers.

A potentially helpful avenue of research are studies investigating other applications of nudging people towards better, more efficient behavior. The research examined here looks at this technique in the case of organ donation. What this study found is that when individuals are automatically opted into an organ donation program, they are far more likely to exhibit prosocial

behavior and stay listed as an organ donor (Yan, 2023). Beyond maintaining a status, nudges can also foster direct action. An example of this comes from research done on an opt-out nudge for influenza vaccination program. The researchers found that participants were far more likely to go to get a vaccination when nudged to do so, rather than being left without any automatic appointment scheduling (Barbaroux, 2022).

Turning to research in the agricultural space, researchers found that non-monetary measures, or nudges, can be very useful in fostering technology uptake by farmers (Howley, 2022). In pairing two nudges together, researchers were able to minimize crowding-out effects while promoting an efficient behavior change. Thinking about what elements a successful nudge would consist of, research into what makes a nudge fail can serve as a guiding principle. An unsuccessful nudge is most likely to happen when confusion is created among the target audience or when the nudge's effects are too short termed (Sunstein, 2017). This insight is productive for the framing of the policy alternative. When done properly nudges can greatly impact an individual's behavior and present a viable policy direction for agricultural policy applications.

Considering what challenges this policy alternative would face, the main obstacles are the legal hurdles to implementation. There may be regulatory opposition to conditioning certain licensing on enrollment in a program. Particularly, charging an opt-out fee would most likely generate resistance in stakeholders. Targeting the nudge on the Virginia based licensing, to avoid conflict with the USDA, and not featuring an opt out fee would reduce the amount of obstacles that could arise.

Criteria

Criteria #1: Effectiveness

The first criteria to be used for evaluating policy alternatives is effectiveness. How effective a policy is will be measured by the number of new users on Market Makers it is anticipated to yield. This number will be projected considering the best data available on each policy. Anticipating enrollment will consist of predicting how many farmers will be reached by a policy and what the target population reaction will be over the short and long term. Once this policy analysis is complete, these assumptions could be validated by follow-up surveys and interviews. The Virginia Department of Agriculture clearly communicated that a primary concern of theirs is the systemic underutilization of the platform. With the underlying goal of assisting small to middle sized farmers who face the most obstacles to efficiency, this platform is centered on as a solution. The end-scoring of the criteria will be based on a concrete number of new users projected for each alternative. As the client considers the evaluation of different policy alternatives, a complete analysis must project effectiveness in stimulating enrollment and usage of Market Makers.

Criteria #2: Cost

The next criteria incorporated into this policy analysis is cost, specifically administrative cost. This criterion will be measured by projecting the cost to the Department of Agriculture to realize each alternative. The possible components of this projection would be the work hours necessary for administration and any program expenditures, ranging from advertising to subsidies. Much of the funding at the disposal of the Virginia Department of Agriculture is mandated or budgeted to be spent in specific manners. Yet, there is additional funding each year, usually around $2 million, that exists in a discretionary fund controlled by the leadership of the department. If a convincing case is made by this research project for a specific usage of these funds, it is possible to do so at the client's directive. As stated by the client, to present a compelling case for policy action, the costs incurred to the department must be accounted for and analyzed.

Criteria #3: Administrative Feasibility

A final criterion for evaluation is administrative feasibility. From the start, a clear goal of the client is measuring the feasibility of each alternative for the Department of Agriculture to implement. Within the state-level authority the client possesses, certain policy alternatives may be simpler and more streamlined to carry out. This policy analysis will attempt to measure policy alternatives on how doable they are under existing agency authority and funding. One of the benefits of this approach is that any approval process is simplified, as well as the agency funding is already fulfilled. This criteria for each alternative will be directly measured by the level of authority needed for policy approval and number of resources needed for proper execution. Scoring how well a policy option fits under the Department of Agriculture's umbrella of policy creation fulfills an expectation of the client directly and enables informed policy creation. The scoring for this criterion will be based on the amount of new work created and oversight required of the Virginia Department of Agriculture for each policy to be fully realized.

Evaluation and Recommendations

Alternative #1: Large-scale Information Campaign

Summary:

The first alternative is an information campaign to raise awareness about and promote enrollment in Market Makers. The focus of this alternative would communicate how essential this information platform is to farmers and its existence to the non-farming public. Searching for an example of a similar program, this alternative would be closely based on what Public Service Announcement partnerships have existed prior to this effort between a department like VDACS and the Ad council, a non-profit advertising organization. Besides the creation of these PSAs, the marketing of this effort should focus on getting the message to key government and non-government sites that citizens regularly use for information gathering and sharing.

Effectiveness:

In terms of effectiveness, increasing enrollment and use of Market Makers, this policy alternative is not promising. Aforementioned research in the Literary Alternative Review discusses the shortcomings of a merely information-based campaign. Increasing awareness versus changing behavior are two very different outcomes. Convincing farmers to alter their business behavior for a program that to-date is unproven would be difficult to do just relying on an information campaign. Furthermore, the difficulties of getting the information to the target audience, small to middle-sized farmers who are not aware of Market Makers, certainly exist. Because of these considerations, this alternative receives a LOW score for effectiveness.

Resulting score: Low

Cost:

The next criterion is cost. The primary factors of cost for this policy option are 1) Creation and Production of Content 2) Information Dissemination. While the creation or content requires intentionality, the goals of this program are straightforward and identifiable. The Information Dissemination costs would make up the large portion of expenses for this

alternative. Paying for advertisements on multimedia platforms or other places would represent a substantial but not overwhelming cost. To best estimate what an information campaign would cost, a U.S. Government Accountability Office (GAO) nationwide PSA report is examined. The average cost for a nationwide PSA campaign according to GAO is approximately $1.5 million (GAO, 2006). Scaling this down by a factor of 50 gives a more accurate hypothetical spend, considering the reduction in state markets pursued. This results in the projected cost for an effective PSA report being around $30,000. Though representing a substantial spending amount, this number is within the potential discretionary budget. Because of this, estimating the overall expenditures with both stages of expenses results in a LOW score for cost.

Resulting score: Low

Administrative Feasibility:

The final criterion is administrative feasibility. The primary involvement for VDACS is the production of the content and selected avenues of dissemination. Promotion of agricultural programs is a common policy action and well within the authority of VDACS to accomplish. Furthermore, with a relatively small cost, this alternative could likely be instituted within the limited discretionary budget the department retains. The creation of the information campaigns does not represent a large administrative burden and the department retains a large amount of authority to accomplish similar policies, resulting in a HIGH score for administrative feasibility.

Resulting score: High

Alternative #2: Farmer Workshop Training

Summary:

The second proposed policy option is partnering with existing farmer workshops to provide training in enrollment and use of the Market Makers platform. To simplify this alternative, the scope of this workshop training would only be integrated into already existing regional and local workshops around the Commonwealth. Organizations such as the Virginia Cooperative Extension or Beginner Farmers are primary providers of these types of opportunities. These conferences can be both in-person or online events. Doing so improves the efficiency of the policy efforts as the farmers are already at these events to grow in the industry. In order for the promotion of Market Makers to occur, VDACS would sponsor a portion of these conferences. Following the initial promotion at these events, to minimize cost but ensure high levels of enrollment, a follow-up advisory call to the farmers could occur over phone or zoom.

Effectiveness:

Demonstrated in the alternative research section, face to face encounters have proven effective in achieving behavioral and business changes among farmers. Seeing direct affirmation of a program's benefits and collective participation is influential. Additionally, the farmers at these workshops would likely be very receptive to the platform as they are already seeking out ways to improve and grow their business. A previously mentioned concern for this policy is the exclusion of farmers who are not seeking out these workshops or are met with barriers to attendance. This alternative received a MEDIUM score for effectiveness, hindered only by the potential exclusion of portions of the target audience

Resulting score: Medium

Cost:

The primary costs for this policy option come from the workshop/program sponsorship financial requirements. In order for Market Makers to be promoted, VDACS would need to become some level of a sponsor at relevant farmer training events. Examining the sponsorship costs for the Virginia Aquaculture Conference tradeshow reveals an spending estimate. In order to receive conference wide-recognition and station to promote Market Makers, it would cost

approximately $2400 (Virginia Aquaculture Conference, 2024). Yet, this cost does not secure being a primary event coordinator, only just one of the premier stations. Additionally, this estimate must be multiplied across other workshops selected over the rest of the commonwealth. To consider the aggregate expenses of promotion, a yearly cost is projected to be about $72,000, scaling the above projection over 30 workshops. This sponsorship may fall below the discretionary VDACS fund amount, but poses a large financial commitment that could even necessitate a multi-year commitment from certain workshops. As a result, this policy is given a MEDIUM score for cost.

Resulting score: Medium

Administrative Feasibility:

In terms of administrative feasibility, this policy appears challenging on many levels. First, determining what workshops exist and building partnerships with the key opportunities requires significant efforts. Moreover, the promotion and training regarding Market Makers at these events must be provided by a VDACS employee or affiliate. With no current VDACS employee explicitly dedicated to Market Makers promotion, sending representatives to all of these workshops is not very feasible. Though the authority for this type of program exists with VDACS purview, this represents a large time commitment and coordination effort, resulting in a LOW score for Administrative Feasibility.

Resulting score: Low

Alternative #3: Subsidize Enrollment and Use

Summary:

The third alternative is a direct subsidiary provided to farmers that enroll in the program. Once enrolled, the farmers would submit proof of active use of the platform and receive a one-time cash transfer. A proposed subsidy amount would be $100 in the first year, $75 in the second year, and $50 in the third year of use. This tapering design would foster a large initial stimulant for enrollment, but decrease the policy burden on VDACS over time. After this initial effort created large positive network effects for users, the need for the subsidy to foster use would decrease as the usefulness of the platform is realized. Furthermore, having a defined end to the subsidy provides a more realistic and feasible course of option for VDACS.

Effectiveness:

A subsidy design to stimulate use and enrollment in the Market Makers platform certainly presents some potential for achieving higher uptake. Altering the financial incentives farmers face can be a great way to induce the desired business changes, in this case incorporation of market markers as a business practice. The concern, however, is the varying preferences that farmers have. Because of these heterogeneous preferences, the correct level of subsidy that actually generates enough desired policy response would be difficult to determine. Even though the financial compensation would certainly generate a response, the actual policy results are unpredictable. As a result, this subsidy effort receives only a MEDIUM for effectiveness.

Resulting score: Medium

Cost:

Not only will the correct level of subsidy be hard to identify, but it also may be impossible for VDACS to reasonably afford. This subsidy would be offered to the approximately 41,000 farmers in Virginia (VDACS, 2021). At $100 in year one, $75 in year two, and $50 in year three, this program could cost over $9 million. This amount, while small in the scope of overall Commonwealth budgeting, far exceeds the yearly discretionary budget VDACS retains of around $2 million. This policy's finances pose an extremely large number for VDACS to

implement and fund over even just three years and would require a major budget appropriation. As a result, the cost score is HIGH.

Resulting score: High

Administrative Feasibility:

This subsidy would be complicated to implement, necessitating close observation for compensation for farmers who truly use the site. A threshold of engagement required for subsidy awarding would need to be established and executed. Furthermore, as mentioned previously, a program of this financial scope is outside the normal operating budget and authority that VDACS retains. Finally, this alternative would require cooperation with both relevant economists and key treasury officers to increase the likelihood of achieving an effective subsidy design. Because of these challenges and complications that could require long stages of approval and execution barriers, this alternative receives a LOW score for administrative feasibility.

Resulting score: Low

Alternative #4: Automatic Opt-in

Summary:

The last proposed policy action is utilizing an existing farmer certification requirement in Virginia to automatically opt-in farmers to using the Market Makers platform. To ensure actual usage and prevent farmers from forgetting about Market Makers, an automatic reminder system would be created following the certification approval. The selected certification for the opt-in program is USDA Certified Organic, as administered and approved by VDACS. The majority of farmers in Virginia, especially small to midsize farmers, retain this designation. The opt-in enrollment would apply to farmers who are currently USDA Certified and to new farmers attempting to go through the process. The main intent is simply that every farmer is enrolled and aware of Market Markers as a tool for utilization.

Effectiveness:

For this policy alternative, the aforementioned research on policy nudges clearly shows how impactful a well-designed nudge for behavior can be. The majority of Virginian farmers seek out this organic certification for at least some of their commodities. A key aspect of using the Certified Organic certification for the opt-in measure is that farmers are required to renew this certification every year (McEvoy, 2014). As a result, within one year every farmer in Virginia will be opted into the platform. Considering this, the opt-in policy reaches a majority of farmers across the commonwealth and provides a simple means towards fostering engagement. Some farmers, however, will still choose to not utilize the platform even when opted in and regularly alerted about the program. Because of this, an Automatic Opt-in alternative received a MEDIUM on effectiveness.

Resulting score: Medium

Cost:

The cost for establishing an Automatic Opt-in program is much lower than the other alternatives considered. The primary financial component is the time spent on coordinating the certification process adaptation and continued oversight of the process, much of which could be subsequently automated. Considering the technical solutions necessary, based on industry

standards this alternative would take a projected 150 working hours to complete (Automated Reporting, 2024). Considering the in-house tech specialists, estimating an hourly rate of $70 an hour, this policy will cost around $10,500 to create and execute (Khristich, 2024). Further time costs may exist in terms of coordinating with the Attorney General's Office to ensure proper program design. Yet these complications don’t pose a significant obstacle, resulting in this alternative receiving a LOW on potential costs imposed.

Resulting score: Low

Administrative Feasibility:

Considering the administrative feasibility of this alternative, there are not many difficulties that would be encountered. The primary logistical hurdle would be setting up the back-end data management pairing certification to automatic enrollment. VDACS retains the capability, staff, and expertise to initiate and institute this sort of program. Because this program is simple in its approach, consisting of a minor regulatory adjustment, it will not require a large amount of oversight in its maintenance. Altogether, it is given a HIGH for Administrative feasibility.

Resulting score: High

Evaluation Summary

To evaluate the alternatives, each level of criteria scoring is associated with a numerical score between 1 and 3. For Effectiveness and Administrative Feasibility, a High Score is given a 3. For Cost, a Low score is a 3. The highest total score will be the selected alternative.

Alternative	Effectiveness	Cost	Admin. Feasibility	Final Score
Information Campaign	Low (1)	Low (3)	High (3)	**7**
Farmer Workshops	High (3)	Medium (2)	Low (1)	**6**
Subsidized Enrollment/Use	Medium (2)	High (1)	Low (1)	**4**
Automatic Opt-in	Medium (2)	Low (3)	High (3)	**8**

Final Recommendation: Automatic Opt-in

The final recommendation of this policy memo is the Automatic-Opt in policy option due to its low costs imposed, high administrative feasibility, and adequate level of effectiveness. By utilizing existing policy structures and nudging farmers towards participation in the platform, this policy option best achieves the objectives laid out by the client. Furthermore, this policy alternative functions well within the existing funding and authority for initiation of the Virginia Department of Agriculture.

Implementation

Implementation Concerns:

Legal authority

A first concern is the legal authority that surrounds the implementation of any policy alternative in the Virginia Agricultural space. A primary concern would be ensuring compliance with the United States Department of Agriculture (USDA) rules and regulations. Ensuring alignment with USDA principles and programs would be helpful in preventing this pushback. Ultimately, if the Automatic Opt-in policy does not conflict with federal law or the Virginia Code, the Virginian Department of Agriculture is the ultimate bureaucratic authority in policy legality. While a policy may be legal, one should also consider the incentives created for farmers. If a policy option ever inconvenienced farmers or proved to be inconvenient, the core essence of this policy initiative would be undermined.

Resourcing

A further potential concern would be the availability of the resources necessary for a policy's implementation both in the short and long term. As mentioned above, the VA Department of Agriculture does retain a discretionary fund of just over $1 million to be used each year. The concern arises if the sustenance of the policy alternative would require funding in the long term. Bureaucrats in the department would much more readily provide a large amount of funds in the short term than be forced to commit funding into the foreseeable future. Without a new provision in the budget, this would effectively reduce the discretionary funding the VA Department of Agriculture retains each year. This concern illuminates what a successful policy alternative would look like: one that does not require large amounts of sustained funding into the future. For the Automatic Opt-in policy, the long-term commitment to resourcing only is the minimal administrative work for managing opting behavior, posing a low level of concern.

Modifying the policy

Another relevant concern is the modification of the policy or the policy's intent during the implementation process. The Virginia Department of Agriculture is the primary policy creator for agricultural policy in Virginia. Because of this, policy implementation, especially for the specific scope this project retains, is done entirely with the Department of Agriculture. As a result, there are not as many concerns with the policy's implementation being modified by bureaucrats as could otherwise be the case. The primary focus would be on that a policy's functioning and administration is made abundantly clear to the bureaucrats within the Virginia Department of Agriculture. As this policy is intended to boost a VA Department of Agriculture program, Market Makers, the concern would be on having clarity in what policy a provision entails communicated to bureaucrats. An additional factor to consider would be if there is a change in governor or senate and house leadership in Virginia. This could result in the creation of an oversight committee that may layer on new policies for accountability for the department.

Adding on new policies

As the problem being addressed is enrollment on the Market Makers Platform, the Automatic Opt-in policy may result in a pairing with other policies that could undermine the purpose and mission of the alternative. For instance, because this alternative is regulatory focused, other mechanisms would need to be developed to coordinate the opting of people in with the list of those retaining licensure. Yet, the VA Department of Agriculture does have a wide scope of capabilities and already has lines of communication for various agriculture programs. The concern with adding on new policies is actually more of an issue with marrying this policy initiative with the existing policies. Any existing policy that would be necessary but is currently poorly functioning would present the clear problem here.

Implementation Logistics:

With all of these concerns in mind, to implement the fourth policy alternative effectively requires careful consideration. A first important step is to ensure the legality of the alternative. Conferring with relevant authorities at the USDA will provide the needed guidance and insight. Second, confirming administrative support can be provided for such a program is important. In the short term this may draw from VDACS's discretionary fund, but in the long term no significant costs are posed. Next, to ensure clear adherence to policy, VDACS leaders should clearly communicate to relevant stakeholders the policy changes and implications. These stakeholders include the bureaucrats at VDACS and the farmers themselves. Finally, dedicating time at the policy initiation phase to examine existing mechanisms at VDACS that could affect this alternative provides opportunities for efficiency gains and avoids potential obstacles. This approach ensures that the Automatic Opt-in alternative would have the best chance at success and best serves the citizens of the Commonwealth of Virginia.

Conclusion

In Virginia, small to middle sized farmers are facing unnecessary challenges and barriers to operating successfully. The difficulties they face not only hold implications for disadvantaged farmers, but also for citizens seeking organic, local produce. Failing to provide an effective policy solution to the information and coordination obstacles smaller farmers face results in and efficiency and welfare loss to Virginians. The Market Makers platform offers promise in helping address these concerns. By gathering farmers together for collaboration, this platform would be able to make local agricultural supply chains more efficient and sustainable.

Yet, Market Makers has failed to realize its potential, experiencing severe underutilization and anonymity. A productive policy solution able to supercharge usage and enrollment would unlock the potential of this comprehensive platform. This policy report projects the best way to accomplish this is creating an automatic opt-in system in conjunction with the USDA Certified Organic recognition in Virginia. When farmers reapply for this certification, their information will be automatically enrolled into an account on the Market Makers platform. They will be subsequently automatically reminded of the platform and its usage potential. This solution seeks to directly address start-up barriers to establishing a high functioning agricultural network. Stimulating enrollment increases the value of the platform by providing opportunities for farmers to work and partner together. Using Market Makers as a mechanism to overcome information and coordination barriers will secure the opportunity for small to midsize farmers to thrive and grow in the Commonwealth of Virginia.

Appendix A - Estimating Alternative Costs

Information Campaigns

Average cost for a nationwide PSA campaign: approximately $1.5 million

Divide by number states (50) to get average cost per state

$1.5m / 50 states = $30,000 total spend per state

Farmer Workshops

Premier workshop sponsorship cost: approximately $2400

Multiple by project number of workshops (30)

$2,400 x 30 workshops = $72,000 total spend on workshops

Subsidized Enrollment

There are approximately 41,000 farmers in Virginia.

For a three-year subsidy design: $100 in year one, $75 in year two, and $50 in year three

Year 1: 41,000 x $100 = $4.1m

Year 2: 41,000 x $75 = $3.08m

Year 3: 41,000 x $50 = $2.05m

Total maximum spend = $9.23m

Automatic Opt-in

Average hourly rate of on contract tech specialists: $70 an hour

Projected number of work hours necessary: 150 hours

$70 x 150 = $10,500 total spend

Work Cited

Agriculture and Forestry Industries in Virginia. Weldon Cooper Center for Public Service. (2022). https://www.vdacs.virginia.gov/pdf/ weldoncooper.pdf

Alif, Živa, Ana Novak, Rok Mihelič, Luka Juvančič, Tanja Šumrada, Can knowledge transfer speed up climate change mitigation in agriculture? A randomized experimental evaluation of participatory workshops, Environmental Science & Policy, Volume 152, 2024, 103662, ISSN 1462-9011, https://doi.org/10.1016/j.envsci.2023.103662.

Automated Reporting. Science Soft. (2024). https://www.scnsoft.com/analytics/automated -reporting

Barbaroux, Adriaan, Ilaria Serati (2022) medRxiv 2022.09.09.22279772; doi: https://doi.org/10.1101/2022.09.09.22279772

Barth, Erling and Bryson, Alex and Dale-Olsen, Harald, Do Public Subsidies of Union Membership Increase Union Membership Rates? (2020) IZA Discussion Paper No. 13747, Available at SSRN: https://ssrn.com/abstract=3704128 or http://dx.doi.org/10.2139/ssrn.3704128

Bentley, J. (2007). Comparing Farmer Field Schools, Community Workshops, and Radio: Teaching Bolivian Farmers about Bacterial Wilt of Potato. Journal of International Agricultural and Extension Education. https://citeseerx.ist.psu.edu/document? repid=rep1&type=pdf&doi=5c1f384f2478efb17a83c2f5ade6da059c7dbbea

Corrigan, Patrick W. PsyD; Powell, Karina J. MS; Al-Khouja, Maya A.. Examining the Impact of Public Service Announcements on Help Seeking and Stigma: Results of a Randomized Controlled Trial. The Journal of Nervous and Mental Disease 203(11):p 836-842, November 2015. | DOI: 10.1097/NMD.0000000000000376

Curry, Theresa. Virginia Farmers Propose Diverse Strategies for Future Food Supply. (2023)

The Crozet Gazette. https://www.crozetgazette.com/2023/08/06/virginia-farmers -propose-diverse-strategies-for-future-food-supply/

Feenstra, G., & Hardesty, S. (2016). Values-Based Supply Chains as a Strategy for Supporting Small and Mid-Scale Producers in the United States. Agriculture, 6(3), 39. MDPI AG. Retrieved from http://dx.doi.org/10.3390/agriculture6030039

Fujimoto, T., & Suzuki, A. (2024). Do fertilizer and seed subsidies strengthen farmers' market

participation? Evidence from Tanzania's subsidy program. Review of Development Economics, 28(1), 339–359. https://doi.org/10.1111/rode.13061

Hong, Jim, Yi She, Shanyong Wang, Marinova Dora, Impact of psychological factors on energy-saving behavior: Moderating role of government subsidy policy, Journal of Cleaner Production, Volume 232 (2019) Pages 154-162, ISSN 0959-6526, https://doi.org/10.1016/ j.jclepro.2019.05.321.

Howley, Peter, Neel Ocean, Can nudging only get you so far? Testing for nudge combination effects, European Review of Agricultural Economics, Volume 49, Issue 5, December 2022, Pages 1086–1112, https://doi.org/10.1093/erae/jbab041

Kennedy, Tori. Conservation Partners. (2022). https://www.conservationpartnersllc.com /conservation-chronicles/therehasneverbeenamorecrucialtimetopreservevirginiafarmland

Khristich, S. (2024, March 11). Hourly it consulting rates, 2024: How to get the most for your money. TATEEDA. https://tateeda.com/blog/it-consulting-rates-per-hour

Mastronardi, L. (2015). Exploring the role of farmers in short food supply chains: The ... - ifama. https://ifama.org/resources/Documents/v18i2/Mastronardi-Marino-Cavallo-Giannelli.pdf

McEvoy, P. by M. (2014, February 26). Organic 101: Ensuring Organic Integrity through inspections. USDA. https://www.usda.gov/media/blog/2014/02/26/organic-101-ensuring -organic-integrity-through-inspections

Nolan, J.M., Schultz, P.W. and Knowles, E.S. (2009), Using Public Service Announcements to Change Behavior: No More Money and Oil Down the Drain†. Journal of Applied Social Psychology, 39: 1035-1056. https://doi.org/10.1111/j.1559-1816.2009.00471.x

Peterson HH, Feenstra G, Ostrom M, Tanaka K, Brekken CA, Engelskirchen G. The value of values-based supply chains: farmer perspective. Agric Human Values. 2022;39(1):385-403. doi: 10.1007/s10460-021-10255-5. Epub 2021 Aug 23. PMID: 34456465; PMCID: PMC8382098.

POP! Market feeds over 11,000 Low-Income and Minority Individuals in Virginia Food Desert during COVID-19 Pandemic. Virginia Cooperative Extension (VCE). (2020). https://www.ext.vsu. edu/blog/2020/11/08/pop-market

Reidenberg, Daniel & Alan Berman (2022) Evaluating the Effectiveness in Initiating Help-Seeking Behaviors by Exposure to an Adult Male Public Service Announcement, Archives of Suicide Research, 26:1, 304-312, DOI: 10.1080/13811118.2020.1774453

Small Farm Outreach Program. Virginia Cooperative Extension (VCE) - Virginia State University. https://www.ext.vsu.edu/small-farm-outreach-program

Spanberger, Abigail. Virginia's 7th District. (2022). https://spanberger.house.gov/posts/spanberger-gonzalez-introduce-bipartisan-bill-to-combat-supply-chain-challenges-in-american-agriculture-lower-food-costs-for-consumers

Stopniece, Santa (2023) "Outdoor Workshops: A Means of Restoration Amidst COVID-19 Online Modes," Journal of Management for Global Sustainability: Vol. 11: Iss. 2, Article 2. Available at: https://archium.ateneo.edu/jmgs/vol11/iss2/2

Sunstein CR. Nudges that fail. Behavioural Public Policy. 2017;1(1):4-25. doi:10.1017/bpp.2016.3

Toncar, M., Reid, J.S. and Anderson, C.E. (2007), "Effective spokespersons in a public service announcement: National celebrities, local celebrities and victims", Journal of Communication Management, Vol. 11 No. 3, pp. 258-275. https://doi.org/10.1108/13632540710780247

United States Department of Agriculture. USDA. (2020). https://www.nass.usda.gov/Statistics_by_State/Virginia/Publications/Annual_Statistical_Bulletin/index.php

U.S. Government Accountability Office (GAO). (2006, January 13). Public service announcement campaigns: Activities and financial obligations for seven federal departments. Public Service Announcement Campaigns: Activities and Financial Obligations for Seven Federal Departments | U.S. GAO. https://www.gao.gov/products/gao-06-304

USDA AGRI-FOOD SUPPLY CHAIN ASSESSMENT. (2022). https://www.ams.usda.gov/sites/default/files/media/USDAAgriFoodSupplyChainReport.pdf

USDA. (2023, November 27) "Biden-Harris administration partners with Ag Producers to strengthen agricultural supply chains and lower food costs." . https://www.usda.gov/media/press-releases/2023/11/27/biden-harris-administration-partners-ag-producers-strengthen

VDACS. Agriculture Facts and Figures. (2021). https://www.vdacs.virginia.gov/markets-and-Finance-agriculture-facts-and-figures.shtml

VDACS. Certified Organic. (2023). https://www.vdacs.virginia.gov/sales-certified-organic.shtml

Virginia Aquaculture Conference. (2024). Sponsor & trade show exhibitor information.

https://vaaquacultureconference.com/sponsor-exhibitor-sign-up-2/

Virginia Market Maker. Virginia Cooperative Extension | Virginia Tech. (2022, February 16). https://ext.vt.edu/agriculture/market-maker.html

Warren, M. (2004), "Farmers online: drivers and impediments in adoption of Internet in UK agricultural businesses", Journal of Small Business and Enterprise Development, Vol. 11 No. 3, pp. 371-381. https://doi.org/10.1108/14626000410551627

Yan, H., & Yates, J. F. (2023, January 1). Improving acceptability of nudges https://www.cambridge.org/core/journals/judgment-and-decision-making/article/improving-acceptability-of-nudges-learning-from-attitudes-towards-optin-and-optout-policies/B3138D784945040A9CFCF9F5DCCA4568

Youngkin, Glenn. Office of the Governor. (2023). https://www.governor.virginia.gov/newsroom/news-releases/2023/may/name-1003075-en.html

Zhong, B. (2015). Information empowers vegetable supply chain: A study of information needs and sharing strategies among farmers and vendors. Computers and Electronics in Agriculture, 117, 81-90.

Zhang, Jinhua, Junjie Wu, Justine Simpson & Clement Lamboi Arthur (2019) Membership of Chinese Farmer Specialized Cooperatives and Direct Subsidies for Farmer Households: A Multi-Province Data Study, The Chinese Economy, 52:5, 400-421, DOI: 10.1080/10971475.2019.1617928