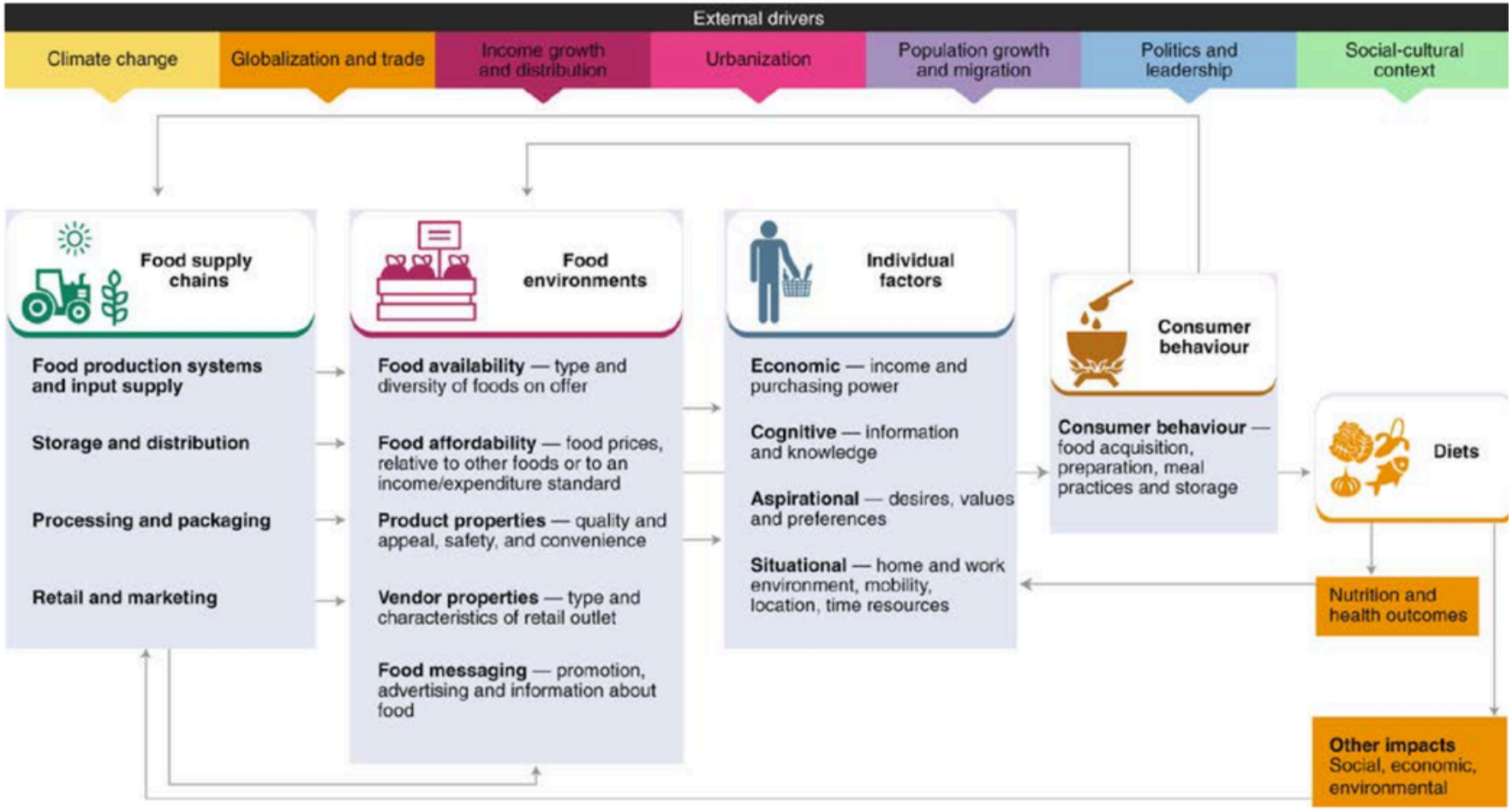
Sector 4:

Food Systems

Background

All Maryland residents participate in and rely on the resilience of our food system, including the infrastructure, equipment, and people involved in food production, processing, storage, distribution, retail, and consumption. The Food System was chosen as one of the five sectors in this strategy based on a review of plans from Maryland and other states. Not only is food essential for the daily life of all Marylanders, but agriculture is Maryland's largest commercial industry, with 12,600 farms employing roughly 350,000 people and contributing $8 billion to the state's economy each year.[1]



Source: Food Systems Framework. Johns Hopkins Center for a Livable Future's Food System Resilience: A Planning Guide for Local Governments.[2]

Climate change, natural hazards, and public health emergencies pose complex and evolving risks to Maryland's farmers and the reliability of our supply chains. This sector focuses on advancing climate-smart agriculture, strengthening local food systems, and enhancing food security through improved procurement practices, land use policies, and strategic partnerships.

Definitions

Definition of the Sector: Strengthening Maryland's food and farm systems by increasing the production and procurement of locally- and sustainably-grown foods, and ensuring the availability & accessibility of nutritious and culturally appropriate food to all communities over time, even in the face of supply chain disruptions such as natural hazards, economic shocks, or public health emergencies.

Long-term food system resilience depends on inclusivity and structural, distributional, and intergenerational equity for all consumers, producers, and food system workers in Maryland.

Definition of Hazard: The Department of Homeland Security defines a hazard as "A source or cause of harm or difficulty."[3] This term is often used to capture **acute shocks** such as hurricanes or cyberattacks.

Definition of Stressor: Stressors are chronic challenges that harm communities on blue-sky days and can make hazards more severe. This term is used to capture **ongoing or structural challenges** like persistent poverty or sea level rise.

Note that while this strategy distinguishes between hazards and stressors for the purpose of discussion, the two are deeply linked and interconnected.

Hazards

Maryland's food system is affected by a wide spectrum of hazards from flooding to extreme temperatures to drought. The hazards highlighted in this section are those most frequently identified by stakeholders through surveys, interviews, and workgroup discussions. The following pages will capture top examples of hazard impacts, but the list contained therein is not exhaustive.

Drought

- Agricultural producers are at the forefront of drought risk. While annual precipitation is projected to rise, Maryland will face periods of seasonal drought, which can reduce crop yields and exacerbate economic pressure for farmers and ranchers.[4]
- The United States Department of Agriculture (USDA) has already designated three Maryland counties – Frederick, Harford, and Washington – as primary natural disaster areas due to drought.[5]

Extreme Temperature

- Farmworkers face severe safety risks, including heat-related illness, dehydration, fatigue, and increased likelihood of workplace injuries, with mortality from heat-related illness 35 times higher for agricultural workers in the U.S. than people working in any other industry.[6,7]
- In Maryland, excessive heat made up 20% of USDA disaster designations between 2012 and 2024, endangering both crops and farmworker safety.[8]
- Temperature fluctuations of 20 to 30 degrees within a single week have become increasingly common in Maryland, disturbing vegetative life cycles, stressing crops, and reducing yields.[9]

Tropical Systems, Severe Storms, and Flooding

- Severe storms can significantly disrupt food supply chains, cause power outages, compromise food safety, and make it harder for communities in both urban and rural areas to access essential resources.[10] Storm-related school closures, such as the ten-day closure of Baltimore City Public Schools during Winter Storm Jonas, can prevent families from accessing the food services they depend on for daily meals.[11]
- Flooding and stormwater runoff from tropical systems and severe storms, as seen during Hurricane Ida in 2021 and Hurricane Irene in 2011, can contaminate edible crops and seafood, severely depleting yields due to food safety requirements (Section 402(a)(4) of the Federal Food, Drug, and Cosmetic Act).[12,13,14]
- In 2024 alone, crop insurers paid farmers $42.6 million to offset storm-related damages.[15]

Public Health Emergencies

- Food safety is a key public health concern. Foodborne illness and contamination can create serious health consequences for Marylanders, pose liability risk for food and agriculture businesses, and disrupt the food supply chain.
- For families facing food insufficiency, school meals programs are critical for daily healthy food access.[16] When schools closed during the COVID-19 pandemic, state and local governments, as well as private organizations, launched alternative food access programs to help mitigate pervasive food insecurity.[17]
- In May 2021, researchers at the Johns Hopkins Bloomberg School of Public Health found that 28.8% of Marylanders were experiencing food insecurity – a 7% increase from pre-pandemic levels.[18]
- Other than in Baltimore City, food insecurity is most significant in Maryland's rural regions, including Western Maryland and the Eastern Shore, due to transportation and healthy food retail limitations.[19]

Supply Chain Vulnerabilities

Supply chain disruptions are a pressing concern for Maryland's food system, as they can be triggered by myriad hazards, including disease outbreaks that hamper internal production; external disruptions from events like a pandemic (which may restrict transportation and harvesting schedules, as exemplified by COVID-19); and labor disputes, such as port strikes along the East and Gulf Coasts.[20,21]

Global food supply chains face significant vulnerabilities at every stage, from crop production to transportation. Labor shortages, shipping delays, and customs slowdowns illustrate how quickly disruptions can restrict access to essential foods worldwide.

In 2017, the Port of Baltimore ranked 29th in the nation for waterborne agricultural exports, moving more than 213,000 metric tons of agricultural products, and Maryland regularly exports agricultural goods to more than 35 countries.[22,23] As such, Maryland is especially susceptible to supply chain risks, which can drive up costs and reduce availability.

Long-term Stressors

In addition to the hazards described above, Maryland's food systems face ongoing stressors that limit the ability of local communities and governments to prepare for, respond to, and recover from disasters. Some of these include:

Food Insecurity & Inequitable Access

Even as one of the nation's wealthiest states, food insecurity and inequitable access to healthy, affordable food in Maryland remain widespread. Recent data indicate a concerning rise in food insecurity throughout the state, with two million Marylanders experiencing food insecurity in 2025.[24]

In Prince George's County and Montgomery County, as much as 34-50% of the population was food insecure in 2024.[25] This is considerably higher than the national food insecurity rate, which sits at 13.5% of American households.[26]

Healthy food may be both physically and financially inaccessible for many communities. More than 70 census tracts in Maryland are designated as healthy food priority areas, or predominantly lower-income areas with limited access to retail outlets that sell affordable, healthy food.[27]

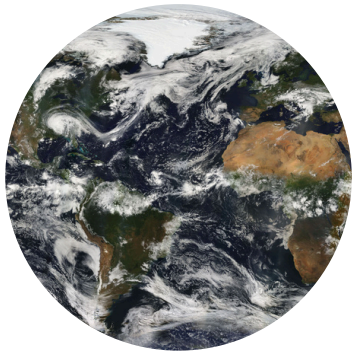
Did You Know?
In fiscal year 2024, 11.1% of Maryland residents (692,966 individuals) received SNAP benefits.[28,29] Of these households, more than a third (37.1%) had children.[30]

Economic Instability

Maryland families are presently facing growing food insecurity pressures as tariffs & inflation drive up production costs and consumer prices, and more Marylanders face wage uncertainty, in part due to federal layoffs.[31,32]

The Francis Scott Key Bridge collapse illustrates how quickly infrastructure disruptions can ripple through supply chains and local economies, triggering increased reliance on emergency food assistance.[33]

Further, with more than 15,000 federal jobs lost in August 2025 and sharp increases in food prices, such as an 11% rise in beef, Marylanders are feeling the compounded strain of economic shocks and cost pressures.[34,35]



Climate Change

Climate change is an overarching stressor that magnifies nearly every hazard in Maryland's food system. Rising temperatures, shifting rainfall patterns, saltwater intrusion, and more frequent heat waves and droughts are altering what crops can be grown and where.[36]

These changing conditions pose particular risks for corn, an important feed source for Maryland's poultry and livestock industries, which generated $245.3 million in 2024.[37,38] As climate impacts intensify, commodity crops like corn face declining yields, resulting in greater economic uncertainty for farmers and rural communities.

Did You Know?
Researchers using satellites recently discovered that Maryland has already lost about 9,700 acres of farmland as rising seas turn fields into salty ground and marshes.[39] Looking ahead, climate change could cause global corn harvests to shrink by almost a quarter by the end of this century.[40]

Existing State Efforts

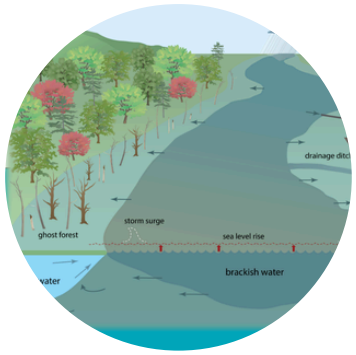
In response to these hazards and stressors, Maryland has taken the following actions thus far:

Maryland Climate-Smart Agriculture Project

Led by the Harry R. Hughes Center for Agro-Ecology, the Maryland Climate-Smart Agriculture Project is a farmer-centered initiative to assess how climate change will impact agriculture in Maryland.[42] The project has two key components:

1. *Evaluating projected climate impacts on Maryland agriculture using tools such as climate modeling and environmental assessments*
2. *Outreach to farmers focused on understanding on-the-ground challenges and potential opportunities*

These efforts informed recommendations to support the agricultural sector's resilience to extreme weather events and other climate change impacts.



Maryland's Plan to Adapt to Saltwater Intrusion and Salination (2024 Update)

Maryland's 2024 Plan to Adapt to Saltwater Intrusion and Salinization outlines the state's response to increasing salinity impacts driven by sea level rise and climate change, which are degrading farmland, forests, wetlands, aquifers, and infrastructure, especially on the Eastern Shore.[36]

Key priorities of the plan include supporting salt-tolerant crops, assessing vulnerable infrastructure, and addressing ecological and economic impacts to protect Maryland communities and the Chesapeake Bay.

This plan is developed by the Maryland Department of Planning and updated every five years.

Maryland Food System Resiliency Council

The Maryland Food System Resiliency Council (FSRC), established by House Bill 831/Senate Bill 723 in 2021, is a thirty-three member interdisciplinary advisory body that makes recommendations to the Maryland General Assembly to address inequities in our food system and strengthen its resilience to potential disruptions.[41]

Led by the Maryland Secretary of Emergency Management, it is coordinated through the Maryland Office of Resilience.

Leaders in Environmentally Engaged Farming (LEEF) Program

The LEEF Program (Leaders in Environmentally Engaged Farming) is a Maryland Department of Agriculture certification initiative to foster land and community stewardship.[43]

Farmers can advance certification levels (tiers) by adopting sustainable production practices, implementing conservation techniques, mentoring new and beginning farmers, and donating food to local communities, among other practices. Each tier achieved will unlock incentives for the farm such as priority access to programs and financing.

LEEF is designed to support the unique needs of farms of all sizes and enterprise models, encouraging environmentally responsible farming across the state.

Challenges & Needs

To appropriately respond to the hazards present in this sector, the following issues should be addressed:

Challenges in Existing Food Processing & Distribution Landscape

Small and mid-sized producers often lack the infrastructure needed for processing, preserving, or storing food. Among these gaps, cold storage stands out as a critical challenge across the food system. Without it, small food distributors are frequently forced to turn away donated or rescued food, leading to unnecessary waste and limiting the distribution of local, perishable food.[44]

The Code of Maryland Regulations (COMAR) 10.15.04 establishes the standards for the processing and transportation of food and drink.[47] While these regulations are essential for public health, smaller farms may face disproportionate challenges in meeting them due to high costs and administrative burden. For instance, laws designed for industrial food processors and distributors may not align with the conditions of small, on-farm processing enterprises.

Adjusting regulations to better meet the needs of Maryland's agricultural producers will enable increased production of value-added products and enhance food preservation capabilities.[48] This will not only benefit Maryland's local food supply but also strengthen local economies through expanded commerce opportunities.

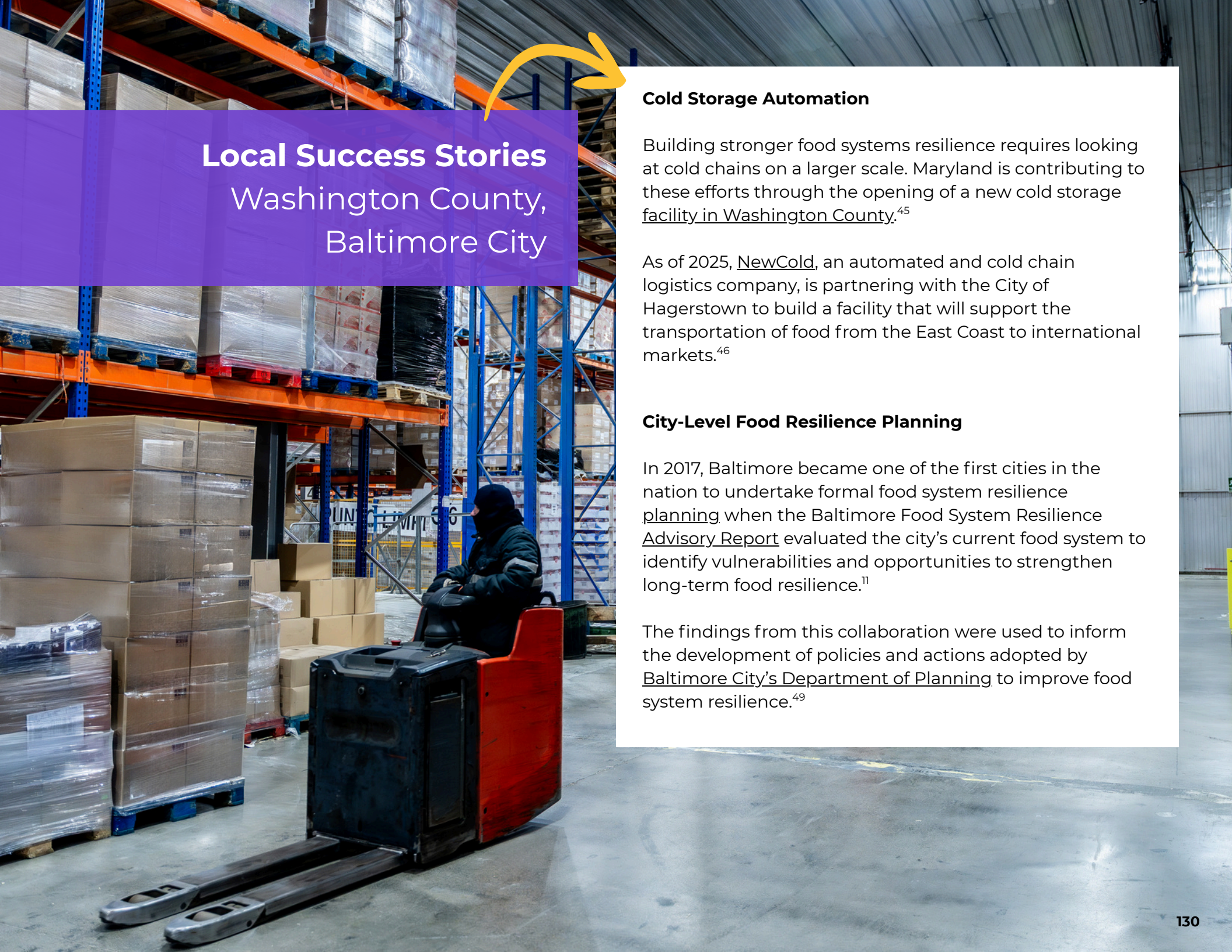
Integrating Food Systems into Broader Planning Efforts

Maryland's food system is deeply interconnected, yet planning efforts for food system resilience often occur in silos. A particular challenge is the lack of integration of certain food retailers, distributors, and other food system actors, especially small and mid-sized operations, into emergency planning efforts.

This exclusion may reduce their capacity to maintain operations, protect the supply chain, and support community food access during emergencies.

Effective planning involves taking into account the full scope of the food system, including production, processing, distribution, and consumption, and strengthening the supply chains that sustain it.[10]

** End of Sector Analysis **



Local Success Stories
Washington County, Baltimore City

Cold Storage Automation

Building stronger food systems resilience requires looking at cold chains on a larger scale. Maryland is contributing to these efforts through the opening of a new cold storage facility in Washington County.[45]

As of 2025, NewCold, an automated and cold chain logistics company, is partnering with the City of Hagerstown to build a facility that will support the transportation of food from the East Coast to international markets.[46]

City-Level Food Resilience Planning

In 2017, Baltimore became one of the first cities in the nation to undertake formal food system resilience planning when the Baltimore Food System Resilience Advisory Report evaluated the city's current food system to identify vulnerabilities and opportunities to strengthen long-term food resilience.[11]

The findings from this collaboration were used to inform the development of policies and actions adopted by Baltimore City's Department of Planning to improve food system resilience.[49]

Goals & Recommendations

Food System

GOAL 1 - Increase adoption of climate-smart agricultural practices in Maryland.

Recommendation 1.1

Implement programs, such as the Leaders in Environmentally Engaged Farming (LEEF) Program, for the adaptation of agricultural practices in response to environmental changes. This may include increases in precipitation, temperature, or soil salinization.

Owner: MDA **Timeline:** 5-10 years, ongoing **Funding:** Funding for LEEF is secured from the Governor's budget. Additional program implementation may require further funding (TBD).

Focus Area: Robust Economy & Job Creation

Why This Matters:

- Maryland farmers have long played a critical role in adopting best practices, helping the State achieve conservation milestones, and protecting the Chesapeake Bay.[50]
- Through programs like LEEF, MDA will continue to incentivize environmentally engaged farming, making Maryland more resilient to environmental changes and bolstering local food systems.[43]

GOAL 2 - Increase sustainable local food production and access.

Recommendation 2.1

Establish and support public-private partnerships to increase local food processing and cold storage infrastructure throughout the state.

Owner: MDA **Timeline:** 2-5 years, ongoing **Funding:** Additional infrastructure implementation may require further funding.

Focus Area: Robust Economy & Job Creation

Why This Matters:

- Small and mid-sized producers often lack infrastructure to wash, freeze, can, package, or store food.
- Cold storage gaps are a particularly critical challenge. Without cold storage capability, small food distributors are frequently forced to turn away donated or rescued food, often locally grown, leading to waste and limiting distribution of perishable goods.[44]
- Through public-private partnerships, Maryland can address this challenge.

Recommendation 2.2

Review and reevaluate regulations for on-farm food processing to support the expanded production of value-added agricultural products.

Owner: MDA & MDH **Timeline:** 2-5 years **Funding:** No additional funding needed.

Focus Area: Robust Economy & Job Creation

Why This Matters:

- On-farm processing can generate new revenue for farmers, reduce food waste, and support local food system resilience.
- However, Maryland's "On-Farm Home Processing License" is unnecessarily restrictive, imposing a revenue cap lower than unlicensed Cottage Food Products.[51]
- While public health and safety are paramount, creative solutions exist to streamline on-farm processing and incentivize Maryland-grown products.

Recommendation 2.3

Create a state-specific food procurement guidance document that seeks to help overcome challenges limiting institutional local food procurement.

Owner: DGS **Timeline:** TBD **Funding:** TBD **Focus Area:** Robust Economy & Job Creation

Why This Matters:

- Institutional procurement of Maryland-produced foods is low. According to the December 2024 Maryland Certified Local Farm and Fish Program Report, just 0.25% of state agency and university food procurement budgets were spent on purchases from Certified Local Farm and Fish providers. This amounts to $238,920 out of a food budget of $97.6M.[52,53]
- By creating food procurement guidance, the Department of General Services (DGS) can better understand the barriers to local food procurement and provide actionable guidance to encourage producer and buyer participation in Maryland's local food system.

Recommendation 2.4

Establish new opportunities and local markets for food accessibility on lands owned by the Department of Natural Resources.

Owner: DNR **Timeline:** 5 years **Funding:** No add'l funding needed. **Focus Area:** Justice & Equity, Robust Economy & Job Creation

Why This Matters:

- Per DNR data provided 11/26/25, DNR owns, manages, and leases approximately 9,373 acres of farmland for crop production and grazing.
- The Department has observed two needs – support for regenerative practices and local access to food produced on these lands.
- For this reason, DNR and MDA are partnering on an initiative that will expand access and use of agricultural lands to environmental justice communities, establish new markets, and support local circular economies.
- This effort will support environmental best practices for farming and increase food production & access, while also mitigating climate impacts.

GOAL 3 - Improve the ability of Maryland's food system to adapt to and recover from supply chain disruptions.

Recommendation 3.1

Build relationships with regional, state, and local food system players, including independent food retailers and charitable food service providers, and exercise their ability to get and stay open in a disaster.

Owner: MDEM-WCI **Timeline:** 5 years, ongoing **Funding:** No additional funding needed.

Focus Area: Justice & Equity, Robust Economy & Job Creation

Why This Matters:

- MDEM's Whole Community Integration Branch's purpose is to "partner, engage, and coordinate with private sector, faith-based, and nonprofit organizations all across our State, ensuring they're integrated throughout all the phases of emergency management."[54]
- By expanding its network, WCI can help food system players better navigate disasters with minimal disruption.

Recommendation 3.2

Leverage the Maryland Food System Resiliency Council to educate state leaders on the role food plays and convene a broad group of food systems stakeholders.

Owner: MDEM-MOR **Timeline:** 2 years **Funding:** No add'l funding needed. **Focus Area:** Justice & Equity, Robust Economy & Job Creation

Why This Matters:

- The Maryland Food System Resiliency Council is an advisory body that makes recommendations to the Maryland General Assembly that address food insecurity and build food system resilience.[41]
- The FSRC members and their broader network are a powerful force multiplier to share information and increase effectiveness of the food system recommendations described elsewhere.

Recommendation 3.3

Evaluate and establish emergency food buying processes aimed at stabilizing the food system during periods when food cannot be easily purchased, imported, or delivered.

Owner: MDEM (collaborating with DGS) **Timeline:** 2 years **Funding:** No add'l funding needed.

Focus Area: Justice & Equity, Robust Economy & Job Creation

Why This Matters:

- During the Covid-19 pandemic, Maryland's local jurisdictions were pushed to design and implement innovative food purchasing and distribution models to address food insecurity resulting from economic instability and supply chain shortages.
- Baltimore City's Department of Planning demonstrated that emergency funds could be invested to purchase healthy, locally grown food for Marylanders experiencing food insecurity.[55] In doing so, they helped direct funds to the local agricultural industry while addressing public health disparities in Baltimore City's under-resourced neighborhoods.
- The State can establish more emergency-contingent contracts with local food producers and distributors to help prevent future food insecurity crises during times of food supply instability or disruption.

** End of Sector Recommendations **

Big Ideas & Open Questions

Navigating the Realities of Rising Temperatures in Agriculture

Agricultural jobs often involve strenuous outdoor labor, leaving workers especially vulnerable to climate-related hazards such as extreme heat. The agricultural workforce is recognized as a high-risk occupational group that faces increasing potential for heat-related illness, among other hazards.[56]

Certain workplace conditions must be modified to adapt to climate change, including upgraded equipment and infrastructure to provide sufficient access to shade, air conditioning, and water, as well as breathable clothing and personal protective equipment (PPE).[57] Agricultural producers may benefit from financial and technical assistance to meet Maryland's Heat Stress Standard and prevent workplace illnesses and fatalities.[58]

Expanding Research for Climate-Driven Crop Transitions

On Maryland's Eastern Shore, climate change is altering what farmers can grow due to saltwater intrusion and rising temperatures. Rising sea levels are pushing saltwater into underground freshwater supplies, degrading soil, and threatening staple crops like corn, wheat, and soybeans. However, there is limited research to guide farmers on the cultivars and growing practices that will remain viable under changing conditions.[36]

To address this need, the Harry R. Hughes Center for Agro-Ecology is leading the Maryland Agriculture Climate Vulnerability Assessment, an initiative that will evaluate how climate change is reshaping the state's agricultural landscape.[59] Crucially, the project will identify salt-tolerant crops with strong yield potential and viable markets, providing farmers with practical options to adapt and sustain their livelihoods as conditions evolve.

New Research

Options for Adapting to Rising Seas (OARS)

Researchers at the University of Maryland are developing a new tool to address the challenges of saltwater intrusion.[60] The tool, named Options for Adapting to Rising Seas (OARS), will help landowners make informed decisions when facing environmental and economic losses due to saltwater intrusion by providing a comprehensive database of programs, policies, and organizations that offer assistance with the impacts.

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