



# Can urban agriculture act as a nature-based solution in Alberta communities?

## AGRICULTURAL GREEN INFRASTRUCTURE: EXPLORING POTENTIAL NATURE-BASED SOLUTIONS IN THE ALBERTA CONTEXT

### INTRODUCTION

Alberta Land Institute's research "Agricultural Green Infrastructure: Exploring Potential Nature-based Solution in the Alberta Context" investigates how urban agriculture can be implemented as a nature-based solution in the urban environment. Ultimately, the research aims at exploring the concept of nature-based agricultural green infrastructure (AGI), which includes both roof and ground-based food production, and how it presents an alternative system for sustainable growth, development, and resilience-building within cities.

#### What are nature-based solutions?

NBS are a multi-dimensional approach to addressing the challenges facing communities today. NBS are defined by the International Union for Conservation of Nature as "actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits" (Cohen-Shacham et al., 2016).

#### What is nature-based agricultural green infrastructure?

Natural forms that AGI can take in urban areas, with a particular focus placed on urban agricultural systems. These forms include, but are not limited to, allotment or plot gardens, rooftop gardens, edible landscapes, urban beekeeping or chicken coops, and urban forests.

This report reviews the benefits and challenges of implementing urban agriculture as a nature-based solution and discusses the opportunities for incorporating urban agriculture in municipalities in Alberta.

### BENEFITS AND CHALLENGES OF AGI

As urban populations grow, nature-based AGI presents new options for cities to manage multiple urban problems. Nature-based AGI can lower precipitation impacts and subsequent flood risks, absorb smog and other harmful pollutants, mitigate the urban heat island effect, reduce the impacts of high winds and urban wind tunnels, and help offset or reverse biodiversity losses caused by urban expansion. Depending on the level of agricultural production, pressure to continue developing new agricultural lands may also be alleviated from rural areas, preserving natural forests and green spaces and maintaining the ecosystem services that those natural areas provide.

These benefits differ slightly depending on what form AGI takes – and whether it is built on the ground or rooftops – but almost all forms contribute to building urban food resilience and security, economic development opportunities, and establishing or expanding community-building projects.

Despite the wide array of benefits AGI can provide, a review of the literature and case studies suggests the success of AGI is highly context-specific. What may work in one city or region may not succeed in another. Furthermore, while there are tangible benefits already being observed in cities that have invested in nature-based AGI, there are also noteworthy challenges that must be addressed, including economic costs, social acceptability, knowledge gaps, competing interests, and climatic and geographic challenges.

## **THE ALBERTA CONTEXT**

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AGI in Alberta is situated in a complex, multi-actor, and multi-institution framework, as federal, provincial, and municipal governments, citizen groups, and non-profit organizations all interact and influence policy. In Alberta, no strategies, policies, or bylaws currently focus on nature-based solutions. However, municipalities have taken initiative and developed local nature-based solutions, including community gardens, greenhouses, and rooftop gardens. Urban agriculture policies are also increasingly featured in municipal development plans and land use policies. Growth management boards at the regional level are also exploring AGI as a topic of interest, including the Edmonton Metropolitan Region Board, which has encouraged municipalities to develop urban agriculture plans under the Regional Agricultural Master Plan.

## **FUTURE APPLICABILITY AND RECOMMENDATIONS**

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Urban agriculture will continue to be an area of interest in municipalities across Alberta. Municipalities, both large and small, are beginning to implement diverse urban agriculture strategies that facilitate new AGI projects. The most commonly cited AGI solutions include community gardens, urban hen and bee keeping, and rooftop gardens.

The experience in other cities offers insights into the role these developments can play in solving our cities' modern challenges. The research team examined and drew lessons from five cities: Chicago, USA; Warsaw, Poland; Stockholm, Sweden; Dresden, Germany; and Venice, Italy. Based on the examined literature, international case studies, and the current governance context, the research team proposes a series of recommendations that Albertan municipalities can take today.

The following recommendations can facilitate the introduction and mainstreaming of nature-based AGI.

**1**

### **Promote collaboration when trying to establish and maintain AGI in urban areas**

AGI is situated within a unique environment, at the intersection of biodiversity, agriculture, and planning. Implementation of NBS should be collaborative, with all relevant stakeholders, community groups, Indigenous communities, and government departments included in the planning, co-creation, and implementation of nature-based AGI solutions.



The report emphasizes that continued work should be done to facilitate active participation and develop tools that reduce departmental siloing. This work may require that municipalities, who alone may not be fully equipped to undertake the co-creation of AGI solutions, collaborate with other municipalities or stakeholder groups.

## **2 Focus on the ecosystem and nature-based benefits of urban agriculture in Alberta's AGI plans**

Typically when urban agriculture is identified as an area for future development in strategies and policies, the primary benefits emphasized are food and community building. The report recommends that new plans and policies pay closer attention to the full range of benefits of AGIs as part of an integrated local biodiversity, environment, and climate strategy. Highlighting these benefits can increase public engagement and support for AGI projects.

## **3 Facilitate knowledge sharing both within and between municipalities and communities**

The research team recommends developing networks, platforms, and tools that facilitate knowledge sharing between stakeholders and encourage municipalities and communities to form networking groups with the express goal of using their collective knowledge to solve AGI challenges.

Sharing knowledge among stakeholders within and outside the municipality can facilitate AGI implementation. Moving forward, Alberta municipalities have the opportunity to share best practices and lessons.

## **4 Leverage new and existing tools that support the implementation and mainstreaming of nature-based AGI**

Both human and financial resources are needed to develop these solutions. Context-specific capacity building is important both at the municipal and individual project level, and the report recommends training initiatives, catalogues, and educational supports to further the process of mainstreaming NBS. The development of these tools should also take into consideration stakeholders at all levels to ensure proper engagement and inclusion.

## **NEXT STEPS**

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The research suggests that AGI – when implemented as a nature-based solution – presents an opportunity to create resilience in the social-ecological system at the municipal level by providing adaptation opportunities against the impacts of climate change, building community structures, mitigating municipalities' contributions to climate change, and increasing food security.

Given that the effects of climate change are becoming increasingly observable in the natural and built environments in Alberta, implementing solutions to create more sustainable and resilient municipalities is imperative.



Emerging work on nature-based solutions has suggested that “the largest opportunities for Alberta lie in climate-smart and economically efficient agricultural practices, followed by conserving and restoring grasslands, forests, and wetlands” (Rissling Wynn, 2022).

This research identifies an interest in urban agriculture as a nature-based solution and a role for it to be implemented under municipal jurisdiction in Alberta, though our findings from case studies, policy, and scholarly literature emphasize the importance of focusing on collaboration, knowledge sharing, and tool development in the process of planning and mainstreaming AGI.

As climate change continues to pose an immense threat to all our systems, nature-based AGI is an asset for Alberta municipalities who are working to not only mitigate climate change but also adapt to climate impacts.

## Works Cited

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**Backgrounder V.01**

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## Alberta Land Institute

The Alberta Land Institute (ALI) ALI is an independent research institute based at the University of Alberta. We are committed to research that supports and enhances land use policy in the province of Alberta and beyond. ALI's work focuses on the changing landscape and the ways that planning and policy design can ensure the long-term sustainability of Alberta's agricultural sector, its water and its natural areas.

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