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# Barriers and Facilitators to Engagement in Collective Gardening Among Black African Immigrants in Alberta, Canada

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**Abstract: Background:** Community gardens are increasingly popular in Canadian cities, serving as transformative spaces where immigrants can develop self-reliant strategies for accessing culturally familiar and healthy nutritious foods. Past research has demonstrated the embodied health and wellbeing benefits of gardening, however, Black immigrants, reported to be at higher risk of food insecurity are experiencing complex barriers to engagement in collective community gardens. Using a socio-ecological framework, this research explores barriers and facilitators to engagement of Black African immigrants in Alberta, Canada in collective community gardening. **Methods:** The study adopted a community-based participatory research (CBPR) approach using mixed-methods to explore the individual and collective experiences, challenges, and meanings adopted by immigrants in connection to collective community gardens. Data collection included structured surveys (n=119) to assess general engagement, facilitators, and barriers, in-depth interviews (n=10) to explore lived experiences, and Afrocentric sharing circles (n=2) to probe collective perspectives. Participants were purposefully recruited through community networks within African immigrant-serving community organizations. **Results:** Our findings demonstrate how various levels of the socio-ecological model (SEM) – individual (knowledge about gardening, busy schedules, and transportation challenges); interpersonal (not seeing people of their ethnicity on the garden); community (distance to the garden); environmental (extreme weather); and structural (inflation, unemployment/underemployment, import restrictions, systemic racism, and government bureaucracy) barriers to most immigrants. These factors interact to limit the maximum engagement of African immigrants in collective community gardening. However, participants who accessed collective gardens reported significant benefits, including maintaining healthy foodways, knowledge exchange, growing social capital, and community connections that support overall wellbeing. **Conclusions:** This study contributes an accessible framework for understanding and addressing the complex barriers that limit engagement in community gardens for vulnerable communities, while highlighting opportunities for creating more inclusive and culturally responsive urban agriculture initiatives.

**Keywords:** collective community gardens; immigrants; urban agriculture; cultural food security; barriers; facilitators

## 1. Introduction

Community gardens are an increasingly popular model of urban agriculture in cities in the Global North and are serving as transformative and restorative spaces for individuals and communities but more specifically for immigrants and refugees [1–3]. Recent evidence in migration and food security literature has shown that engagement in community gardening creates opportunities for immigrants to reshape their relationships with the food system in host countries by

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providing self-reliant strategies for accessing healthy food options and producing culturally familiar foods [2,4–8].

Beyond nutritional benefits, these spaces cultivate neighborly connections and the recreation of social supports for newcomers. For immigrant communities, such spaces can be crucial in maintaining healthy foodways, a sense of belonging, and relationships that support well-being [1,2,6,9–11]. Indigenous and migration scholarship increasingly recognizes the role of community gardens in intergenerational knowledge-keeping and place-making [12–14]. Such evidence shows community gardens represent more than a means for household sustenance to also create opportunities for individuals to engage meaningfully with the environment, build social capital, and negotiate identity [15,16].

Past studies have demonstrated how engagement in community gardening is correlated with improved health and successful integration, particularly in immigrant and refugee communities [2,17,18]. Studies have also highlighted how collective growing spaces support household food security while enabling immigrant and refugee communities to maintain foodways and build neighborly connections. This trend has been observed across cities with significant immigrant populations, where urban gardens serve as transformative spaces that bridge cultural divides while promoting food security and embodied well-being [19,20]. There is a consensus in the literature about the embodied benefits of community and collective gardening – encompassing physical, mental, and social health benefits, in the context of immigration [6,19,21].

Community and collective gardens differ from one another in motivations, outcomes, and function through both individual and collective decision-making [5]. The primary difference between community gardens and collective community gardens is in the level of collective versus individual agency in land use, cultivation, and harvest [22]. Collective community gardens mostly involve shared cultivation, harvesting, and distribution of produce among community members. Urban allotment and collective community gardens face barriers including land scarcity, unclear regulations, and infrastructure limitations, while being facilitated by community cohesion, health benefits, and institutional support, with varying priorities between developed and developing countries [23].

Despite their growing popularity and documented gains, community gardens are unevenly distributed in North American cities, with data showing higher concentrations in educated, higher-income, and predominantly non-immigrant neighborhoods [24]. A recent study in the United States reported that such dynamics as the physical location of the community gardens and how their objectives are framed can be important predictors of interest and participation [25]. Other previous studies found a significant association between perceptions of community bonding, social capital, and involvement in community gardening at the individual level [26,27]. A similar study that focused on an exploration of experiences of refugee and immigrant gardeners, mostly of South Asian descent, found that barriers to participation in community gardening manifest in unique ways including spatial and transportation challenges [1]. Neighborhood characteristics and social capital can be significant predictors of community garden participation among the general population. However, approaches that center the lived experiences of participants, especially immigrants, and how they perceive and use these spaces can inform more inclusive collective community gardens what will serve the needs of growing immigrant populations in North American cities [20,21].

The literature in this area has long been dominated by research based in the U.S.A. [22,28–30]. However, recent studies emerging from the Canadian context have recommended more accessible green spaces, including community gardens as important resources in immigrant neighborhoods [16,31,32]. Unfamiliarity with the local environment and the cold Northern climate have been identified as barriers in Canadian cities, however, opportunities for obtaining healthy food, building new relationships, and emotional restoration were key motivations that outweighed those barriers for the participants [17,31]. There has currently been limited exploration of potential barriers to engagement in collective community gardening for high-risk populations such as racial minorities and immigrants in the Canadian context [11,33]. These racial minorities are at higher risk of

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experiencing moderate to severe food insecurity, with Black Canadians being the most affected racial group [34,35]. A significant association was found between living in food-insecure households and mental health issues among Immigrants and refugees in Canada [36,37], this group had also been found to be at higher risk of chronic mental illness including anxiety, depression and Post Traumatic Stress Disorder (PTSD) [38–42]. Such groups can potentially benefit from increased engagement in collective community gardening. However, little attention has been paid to how Black African immigrants in the Canadian Prairies engage with these spaces, what it means to them, and areas that could be improved on to make these spaces more inclusive and accommodating for this group. Therefore, in this study, we systematically identify the facilitators and barriers to engagement in collective gardening with a focus on how these spaces can better serve to maintain healthy foodways post-migration and cultivate neighborly connections that support wellbeing and integration of African immigrants in Edmonton, Alberta, a popular destination for immigrants of African descent in the Canadian Prairies [43]. The research question that guided this study was: *What are the barriers and facilitators to engagement in collective community gardening among Black African immigrants settled in Alberta, Canada?*

**Theoretical framework** - *Socio-ecological model*

The socio-ecological framework by [44] and [45] informed the conceptualization of this research examining barriers and facilitators to engagement in collective community gardening. The model incorporates the interactive effects of individual, interpersonal, community, environmental, and structural factors to examine participation in gardening and to help understand the intersecting barriers operating at different spheres of influence [1,5]. The framework is particularly relevant for immigrant communities as it helps uncover how personal factors (like time and resource limitations) interact with interpersonal dynamics (such as cultural connections and discrimination) and broader structural constraints (including systemic inequities) to influence garden participation [1]. At the individual level, we examine micro-level factors such as demographic characteristics, time constraints, gardening knowledge and skills, and economic circumstances. The interpersonal level encompasses social networks, cultural connections, experiences of discrimination, and relationship dynamics within garden spaces. Community-level factors include garden accessibility, decision-making processes, and organizational characteristics of collective community gardens. Environmental factors consider climate constraints, growing seasons, and physical infrastructure, while structural factors examine systemic barriers like immigration policies, the economic environment, and resource allocation.

Previous studies have primarily focused on individual motivations or garden-specific factors [1,24,25,31] without examining how these circumstances intersect with broader systemic influences to shape participation. This framework allows us to model both “upstream” structural barriers and “downstream” individual constraints that often combine to create complex barriers to engagement in collective gardening for immigrants of African descent. Even though the different levels are distinguished analytically, they are highly interactive – structural barriers manifest through individual experiences, while personal circumstances are shaped by systemic factors. This systematic approach reveals the complex ecology of participation; we extend beyond singular explanations to uncover how various factors combine to create patterns of inclusion and exclusion in community garden spaces. This understanding is crucial for developing more equitable and accessible collective community gardens that can be inclusive and welcoming for diverse immigrant communities.

## 2. Materials and Methods

*Research Design*

We employed a community-based participatory research (CBPR) approach guided by principles outlined by [46] and [47]. The study was conducted in Edmonton, Alberta, a popular destination for immigrants of African descent in Canada [43]. Our community partner, Sinkunia Community Development Organization (SCDO), an African-led non-profit organization, played a crucial role in

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shaping research objectives and facilitating community engagement. Sinkunia CDO operates various settlement programs and provides culturally appropriate support services for African immigrants in Alberta, including initiatives like a collective community garden and partnership with the Edmonton Food Bank to improve access to culturally appropriate supports. In these food security initiatives, SCDO identified the gap in evidence to support those activities, particularly the collective community gardening work. This culminated into the current project that will guide the operations of the organization's collective community gardening initiatives. In this CBPR project, we maintained continuous engagement through regular meetings and feedback sessions with our community partner who was involved in the design, implementation, analysis, and knowledge mobilization [47,48].

*Participant Recruitment*

Participants were purposefully recruited in collaboration with SCDO and existing community networks, including the Somali Cultural Association, Kenyans in Alberta Association, Nigeria Association, and the Africa Centre. Participants were eligible if they were: (1) Recent immigrants (mostly within the past 10 years); (2) are of African descent and identifying as Black; (3) had lived in Edmonton for not less than 2 years; (4) aged 18 years or older; and (5) are proficiency in English language and gave informed consent.

***Surveys:*** The survey study (n=119) instrument was designed to assess multiple levels of barriers and facilitators to engagement in collective community gardening. The survey was designed to assess general trends in the population regarding engagement in urban agriculture, types of gardening participants are currently engaged in, and general barriers and facilitators of engagement. The survey findings informed our knowledge of participation patterns and gave a general sense of some common barriers and facilitators. The surveys were administered through Survey Monkey combining face-to-face interviews and telephone conversations for broader accessibility of the immigrants who are often engaged in multiple low paying jobs and other responsibilities. Survey data were exported into SPSS version 29 for analysis. Descriptive statistics, frequencies, and proportions were calculated to summarize the demographic characteristics of the sample and key variables.

***One-on-one interviews:*** To obtain nuanced narratives, we conducted 10 in-depth interviews (IDI) with purposefully selected participants from the survey sample. Participants were selected to ensure adequate representation, considering factors such as age, gender, ethnicity, and year of arrival. The interviews were designed as semi-structured, open-ended conversations, creating a "listening and conversational space" (Creswell & Poth, 2018) where participants could freely articulate their experiences, views, and narratives. Interviews lasted approximately 35-60 minutes each and were conducted virtually to accommodate participant schedules and preferences.

***Afrocentric Sharing Circles:*** Participants were engaged in facilitated online sharing circles (n=2). In these sessions, we designed the process to create a safe space and encourage participants to engage authentically as Black people and to share their stories in a non-judgmental and culturally affirming space. This approach created space for dialogue and allowed us to probe for deeper insight where necessary. Participants shared personal and collective experiences of facilitators and barriers to engagement and general experiences with collective community gardening in Edmonton, Alberta.

All IDI and Afrocentric sharing circles were digitally recorded, transcribed verbatim, and imported into NVivo version 15. Transcripts were then iteratively analyzed deductively (using the socio-ecological framework), and inductively to allow new themes and sub-themes to emerge and to develop a standard set of codes describing patterns observed in the data. The coding process followed Braun and Clarke's [49] six-step for thematic analysis: (1) Data familiarization; (2) Initial code generation; (3) Theme identification; (4) Theme review; (5) Theme definition and naming; and (6) Report production. The coding process was iterative, with line-by-line content analysis. We integrated qualitative narratives with survey data to strengthen the validity and depth of our findings. This triangulation approach enabled a comprehensive analysis of participant experiences while preserving the richness of individual accounts.

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*Ethics and Participant Protection:*

The study received approval from the University of Alberta Research Ethics Review Board (Protocol ID: Pro00134979). After receiving information about study objectives, benefits, and potential risks, participants provided informed consent (written or verbal). With permission, virtual interviews were recorded. To ensure confidentiality, we collected no personal identifiers, and participants controlled their level of disclosure. Participation was voluntary, and participants had the right to withdraw at any time. All data was de-identified and securely stored following the University of Alberta data management guidelines.

## 3. Results

In this section, we present a synthesis of the results emerging from our fieldwork. We begin by presenting the demographic information of the survey, in-depth interviews, and Afrocentric sharing circle participants. Subsequently, we summarize the common types of gardens participants were engaged in at the time of data collection. Finally, we present a synthesis of the facilitators and emerging themes related to the barriers to engagement in collective community gardening

### *3.1. Socio-Demographic Characteristics of Survey Participants*

As detailed in **Table 1**, the majority (55%) of respondents were female, this trend was also observed in general garden participation as more females were engaged in collective community gardening than males. In addition, the sample had a median age of 39 years, indicating a relatively young population, most of whom are starting new families in Canada, with significant time and resources dedicated to childcare. Furthermore, most participants had migrated within the last 10 years, indicating that many newcomers to Canada. At least 7 in 10 participants were post-secondary educated, spanning some college to a post-graduate degree. However, only about half were employed. One in five had more than one job, indicating that such highly educated newcomer individuals, still navigating socioeconomic and cultural changes and are taking up multiple low-paying jobs to make ends meet.

Migrants participate in different gardening types including home/backyard gardening (41.2%), collective community gardens (18.7%), and collective community gardens (37.0%). Further analysis of the results revealed the facilitators and barriers that influence interest and engagement in collective community gardening.

**Table 1.** Participant Demographics of Online Survey.

| **Survey participant demographics, n=119** | |
|---|---|
| **Gender, n (%)** | |
| Female | 65 (54.6) |
| Male | 54 (45.4) |
| **Year Born, median (range)** | 1986 (1948 - 2006) |
| **Year Arrived to Canada, median (range)** | 2014 (1978 - 2024) |
| **Employed, n (%)** | |
| Yes | 66 (59.4) |
| No | 45 (40.6) |
| **If yes, do you have more than one job? n (%)** | |
| Yes | 13 (19.7) |
| No | 53 (80.3) |

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| | |
|---|---|
| **Highest Level of Education, n (%)** | |
| No formal education | 1 (0.8) |
| Elementary/Primary complete | 3 (2.5) |
| High School | 29 (24.4) |
| Post-secondary | 86 (72.2) |
| **Marital status, n (%)** | |
| Never Married (Single) | 50 (44.2) |
| Married | 56 (49.5) |
| Common Law | 2 (1.7) |
| Separated/widowed | 5 (4.4) |
| **Household size, n (%)** | |
| Single person | 11 (9.2) |
| 2-5 people | 43 (36.1) |
| More than 5 | 65 (54.6) |
| **Household Structure, n (%)** | |
| Female-centered | 28 (23.5) |
| Male centered | 21 (17.6) |
| Nuclear | 54 (45.4) |
| Extended | 16 (13.4) |
| **Common types of gardening, (%)** | |
| Home/backyard gardening | 49 (41.2) |
| Collective community gardens | 44 (37.0) |
| Community gardens | 33 (27.7) |
| No identified | 22 (18.5) |

### *3.2. Facilitators of Engagement in Collective Community Gardening*

In this section, we present the findings regarding the factors that motivated people to engage in collective community gardening. The results from the survey are synthesized with qualitative findings to holistically examine the facilitators of engagement that were identified by the participants.

The survey findings in Figure 1 revealed that most participants were engaged in collective community gardening due to the opportunities such spaces create for them to meet new people, form connections, and develop social supports. Other notable facilitators include having access to land, knowledge, and resources, as well as being supported by community organizations. (See Figure 1 below).

A further analysis of data emerging from the IDIs and Afrocentric sharing circles revealed key themes relating to facilitators of engagement. These included: a) connections to agriculture and food production; b) the associated health and wellbeing benefits; and c) the social connections and opportunity to meet new people

***Connection to agriculture and food production:*** It was observed that for some participants, a perceived connection to growing food was a key motivation. This was notable among participants who expressed how agriculture was a part of their identity in their home countries before migration. Therefore, engaging in collective community gardening gave a sense of continuity, and place-making regarding maintaining healthy foodways post-migration. Participants expressed strong interest in growing culturally familiar vegetables and herbs, viewing collective community gardens as potential spaces for cultural food sovereignty.

> *I have been involved in collective community gardening. I love gardening a lot, unfortunately, I didn't know about it earlier. It is one of the best things one can do, any community or any culture that treasures farming, they can thrive. They don't need to depend on external help for survival. But*

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*if people become lazy, and they think that everything should come from their central government and sit down and wait for the government to do something, then it's a recipe for disaster, for the people, or for the community. So yes, I have been involved, and I would love to continue.* (IDI-06)

*I can say it's important to me, partly because these are the foods that I have grown up with, and also because I understand the nutritional value of some of these foods, especially the vegetables.* (IDI-02)

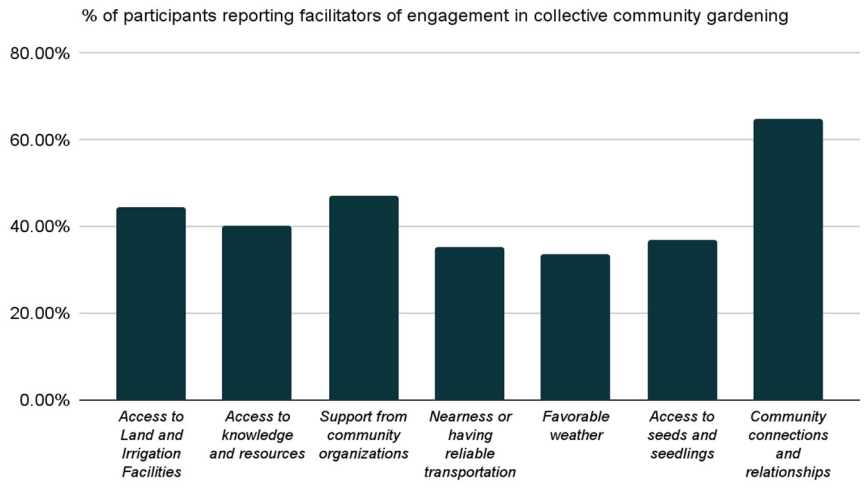


**Figure 1.** Proportion of participants reporting facilitators to engagement in collective community gardening.

***Perceived health benefits of engagement in collective community gardening:*** Participants frequently expressed multiple perceived benefits of engaging in collective community gardening, including access to fresh organic vegetables, physical activity, and social supports.

*Collective community gardening comes with a lot of benefits. To start with, you meet new people, people from different backgrounds and you form a community. We have different communities that we belong to. But you become part of a community, another community that is different from the ones that you're familiar with.* (IDI-05)

***Meeting people, forming connections, and building social capital in the community:*** Underscored by participants who perceived collective community gardens as welcoming spaces where they can come out to meet people, cultivate new relationships, and nurture support for overall wellbeing and intercultural learning. Social capital played a role in engagement, with participants who knew someone already involved in collective community gardening expressing greater interest.

*Because I once saw my friend bring tomatoes from a collective community garden, not the one from the shop. From a real garden. It made me feel like, "Wow, is this being done here?" I was wondering how people were able to plant these things. So that got me curious that if there is a way, then maybe I will try it and learn from it.* (IDI-04)

Building relationships within the community emerged as another motivation, collective community gardens are seen as welcoming spaces for building social capital and knowledge exchange.

*In the collective community garden, because we have people from different countries, they come, and they're like, "What are you growing there?" Vegetables that they've not seen, or they are like, "How do you prepare this?" Like when they see me grow a lot of kale, then they're like, "What are you going to do with all that?", then with that, we now start talking about, you know, how I use it, how I'll prepare and store it. And yeah, so the collective community garden, it's helped me learn quite a lot, meet people, and see how they are planting, you know, different ways of doing that because I learn something new. (IDI-02)*

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When gardens were accessible and culturally welcoming, they served as important community spaces. Opportunities to meet other people who shared the same background and experiences in the collective community garden were identified as key facilitators, cultivating such community and neighborly connections created an enabling environment where individuals felt valued, welcome, and appreciated.

### *3.3. Barriers to Engagement in Collective Community Gardening*

Our analysis uncovered the complex interactions between different factors across the multiple spheres of influence. We present these results in synthesis with survey findings to uncover the multilayered barriers to engagement in collective community gardening.

Participants reported barriers to engagement in collective community gardening. Figure 2 shows that the majority of such participants reported not having knowledge or access to information about collective community gardening initiatives. Others report that distance from the community garden, lack of reliable means of transportation, or lack of time were barriers to participation, and over half of participants reported busy schedules as barriers to engagement.

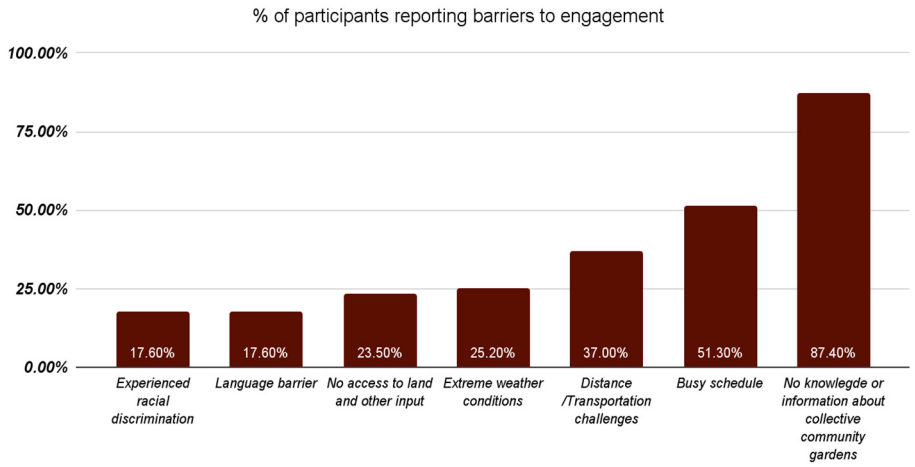


**Figure 2.** Proportion of participants reporting barriers to engagement in collective community gardening.

Our analysis revealed five interrelated themes guided by the socio-ecological framework that characterize barriers across the multiple levels: (1) Personal/Individual level factors, (2) Interpersonal/Social factors, (3) Community-level/Organizational factors, (4) Environmental factors, and (5) Structural/Systemic barriers. Figure 4. illustrate the complex ecology of participation in collective gardening spaces. Each level is accompanied by specific factors identified through fieldwork: individual factors (e.g., busy schedules, financial pressures), interpersonal factors (e.g., community connections, racial discrimination), community factors (e.g., accessibility, decision-making), environmental factors (e.g., climate, growing seasons). The conceptual framework in Figure 3 shows the interconnected nature of the factors and how they interact to limit engagement of immigrants.

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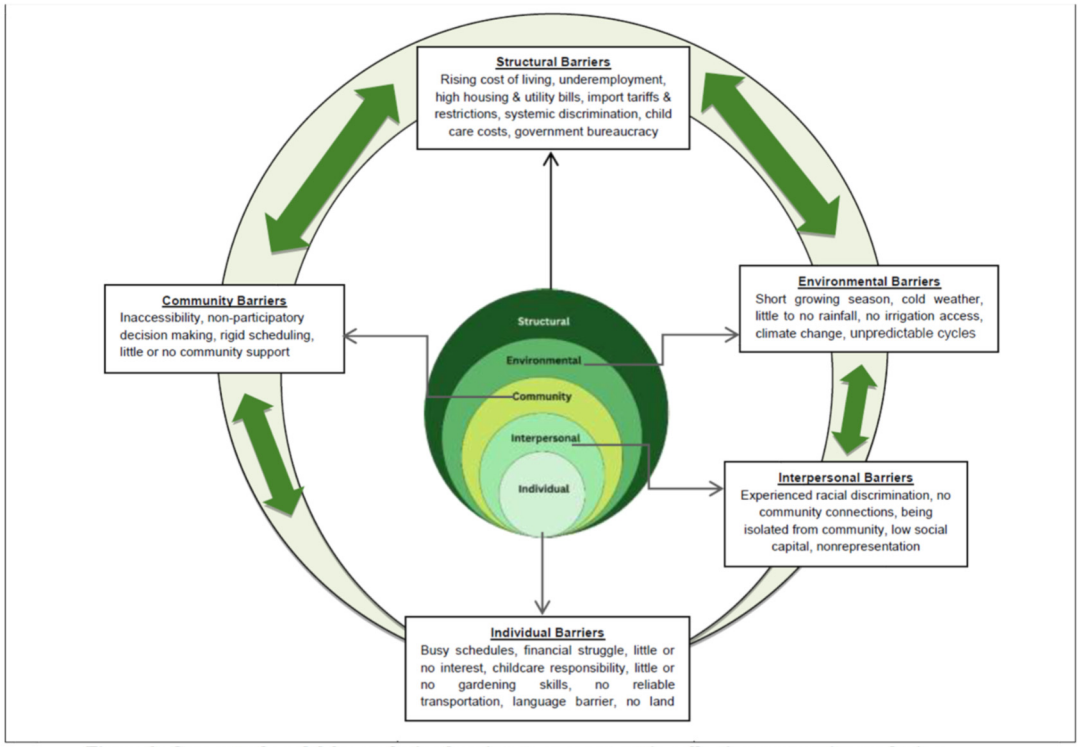


**Figure 3: Conceptual model for analyzing barriers to engagement in collective community gardening**

***Personal or Individual Level***

Over half of survey respondents reported busy schedules as a primary constraint. The demands of managing multiple responsibilities, particularly among those serving as primary breadwinners or caregivers, create time and resource constraints. As one participant noted in the interviews:

> *For those of us that are immigrants, one major barrier will be the time factor…. You see, many families, especially in the Black community, are working, trying to survive, and many of us have young ones, because we are immigrants from not more than 20 years. Let's say from 15 years up, so many of them have new families, young children, so time would be a factor, the time they go to work, the time they go for their businesses. It could be a factor for people to come out.* (IDI-03)

Financial struggle and childcare responsibilities further compounded these constraints as mentioned by most of the participants.

> *You know, people are thinking about how to pay their rent, how to pay their bills. So that can be one barrier, why people are not able to go and volunteer to do collective community gardening, because they are thinking about their bills, you know? Like for me, I work twelve hours. You work twelve hours. When you come home, you have to do a lot of work again, cook, take care of the kids, so sometimes it's challenging. It's a big challenge.* (IDI-01)

Majority of the participants reported lack of knowledge or information about collective gardening opportunities as a barrier.

> *If I can have the floor, I haven't heard of community gardening actually, to be honest. I haven't and that was probably why I as a person has not participated. But I mean, I would love to. I would love to see how that would work. I'm open to trying new things, and something I think it's available. Of course, but why I haven't done it is because I have never had an opportunity. In fact, I'm just hearing about it for the first time. (P-01 SC-2)*

This information gap was mostly among newcomers, who expressed uncertainty about where and how to access collective community gardens. Language barriers, reported by some participants, complicated access to information and participation.

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> *Like I said, I had no idea that a collective community garden exists in Edmonton, but if I had known that there was a community garden, I would have wanted to be part of it. But what would have hindered me from joining such initiatives would probably be my current engagement, which is my studies. I think my studies would be the – one of the major factors I would think that would hinder me from being a part of the community. But as someone who is a garden person, I would definitely make out time.* (IDI-07)

In addition to individual level factors, our analysis also uncovered another sphere of influence relating to interpersonal relationships and networks of community connections.

***Interpersonal and Social Dynamics***

Interpersonal and social dynamics can create barriers that may be external of the individual but can influence interest and engagement. Some participants recalled experiences of othering and racial discrimination.

> *My friend and I are the only Black people in that group. I don't mind saying this, sometimes we've faced racial discrimination. Not from everybody. No. But a few people, some people. There are people who love us for who we are, no matter our colour. Such things happen. We face discrimination in the area of work. Sometimes you will see it, not all the leaders. But some of them, when we come, they will want us to do the bigger work, the work that requires more energy, but during harvesting we will be left out. Or others, are allowed to harvest whatever they want, but whenever it comes to people of colour like us, we are treated differently. But we still continue to go, to attend. That is where we now wish, oh, [pause] how we wish we have our own community garden.* (IDI-03)

Situations where participants felt like they were treated unfairly, or where they felt unwelcome, such individuals can be demotivated, creating interpersonal barriers to engagement. Our analysis further uncovered community level factors that operate outside of personal and interpersonal factors to create patterns of inclusion or exclusion.

***Community-Level and Organizational Factors***

Non-accessibility emerged as another barrier, over a third of survey respondents faced distance and transportation challenges.

> *I know some people who are not able to come to the collective community gardens because they are far from where they live. Like where we farm, for instance, I think it's maybe more than 20 kilometers away from where we live, so it depends on, do people have time to go to the community garden, and how close is it? I had to find a way to create beds and grow in my backyard. They are close enough, I'm able to water them when I need to, unlike the community garden, which is far away. I'm able to harvest when I need something, even preparing food in the kitchen, then I just go to the backyard and get that. So for me that's the easiest place to farm, unlike the collective community garden. So that's what I can say has also been a main challenge for me.* (IDI-02)

> *You know, people can even have spaces that are closer to where they live. People can decide that, "Oh, I would belong to the one that is closer to my house," So it would be more convenient. Besides creating awareness, convenience is also another thing. My husband, for instance, has never come to the collective community garden. Because we live in the Southwest, and the collective community garden is on the Northside. My husband does not like going far. And even when we offer to take him, he's like, "No, I'm not going." So some people would not want to maybe drive ten minutes, 15 minutes, you know, between ten and 20 minutes to get to the collective community garden. So convenience is a barrier for some people.* (IDI-05)

Non-participatory decision-making regarding what should be grown was identified as another barrier;

> *There is a time I had wanted to join a certain collective community garden. But then I was like, "When it comes to the collective, how do people make decisions on the type of vegetables or fruits to grow?" "How do you decide, or how do you agree that we are going to grow this type of vegetable and not this other one?" Unless you are having people with similar tastes, at a collective garden, so*

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> *that, you know, somebody might be like, "We are going to grow 20 heads of lettuce," and then people will agree, because they like to eat salad. But then if you have a mixed group of people, I can imagine telling people from my community, the Kenyan community, like, "You are going to grow lettuce on half of the garden," they will be like, "For what? [Laughs] I want to grow vegetables." So collective community gardens, it really depends on who is involved, because we have different tastes, different desires. In a collective garden, how do people make decisions on what to grow?* (IDI-02)

> *I am involved with a collective community garden, here in Edmonton, but you find that all we do is to garden Canadian food, or even other foreign foods, and not African, but European foods. Because I remember we planted lots of garlic. They bring different species of garlic from Germany, Bulgaria, although they will say, "This one is German, this Bulgarian's flavour," all those species of garlic. And others, maybe like tomatoes, different types of tomatoes, they have the Italian, they have the Mexican, and things like that, but nothing from Africa.* (IDI-03)

In addition, participants identified environmental constraints to collective community gardening in Edmonton's Northern climate.

***Environmental Constraints***

Short growing season, cold weather, and limited irrigation facilities were identified as environmental barriers. The short growing season characteristic of Canadian weather posed specific challenges for growing culturally familiar tropical vegetables that typically require longer.

> *Yeah, so I grow my own vegetables, I only buy vegetables when I've not been able to grow enough. Like last year I wasn't around. I was visiting home, so we did not grow a lot of vegetables here which means that now we are buying. So I can't wait for May to grow my vegetables. The growing season is short, from May to mid-September. Yes, if your plants go to October, you are taking a risk, because frost can come anytime, especially at night. So normally sukuma wiki can survive into maybe mid-October, but the other vegetables, once they are hit with the first frost, they just die. So again, when you are planting vegetables, you have to know what you must harvest by September and know what you can risk leaving in the garden.* (IDI-02)

Climate change impacts and unpredictable growing cycles were noted as emerging concerns creating an uncertain environment for gardeners.

> *As immigrants, we are not able to afford a greenhouse unless we have to rent a place in the greenhouse, which is expensive. We have access to shared community spaces. But, you know, depending on the season, if there is rain, then you will get a good harvest there. If there's no rain, you will not get any harvest, and if the rain is too much, it destroys away your harvest [Laugh] – like last year we planted our things in one of the collective community garden, and you know, there was a heavy storm, hailstorms that destroyed everything that we planted there. It was a big loss. [Laughs] Yeah, so that brings another distress for the collective community garden. So the greenhouse, it's necessary, so that if there is a big storm, or whatever, hailstorm, it won't be affected.* (P01 SC 1)

***Structural Barriers***

Our analysis revealed the structural barriers that exist for immigrant communities. Rising costs of living, unemployment or underemployment, and high housing costs have created financial pressures that limit the capacity to engage. Import restrictions on inputs such as seedlings from participants' countries of origin significantly affected their ability to grow and experiment with some traditional varieties and herbs. Systemic racism and racial discrimination, reported by some participants, manifested in both subtle and overt ways, affecting feelings of belonging and inclusion in collective community garden spaces. The influence of these structural barriers created compounded challenges for participants navigating different barriers to engagement.

## 4. Discussion

This study has generated novel insights into the complex interplay of factors influencing Black African immigrants' engagement in collective community gardening. Applying a socio-ecological

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model (SEM), we identified multiple interconnected barriers and facilitators operating across individual, interpersonal, community, environmental, and structural levels. The demographic information of the participants of this study reveals important context. The majority of young families among participants, most of whom migrated within the last decade, reflect the broader immigration patterns in Edmonton, with a growing Afro-Caribbean population. Most participants were highly educated; however, employment challenges saw one in every ten participants having to take up multiple lower-paying jobs to make ends meet. This situation points to broader systemic barriers to immigrants' social and economic integration.

The facilitators identified in this study demonstrate the multifaceted benefits of collective community gardening for immigrant communities. Some participants' strong connection to agriculture and food production, often rooted in pre-migration experiences, is a primary motivator. These findings are consistent with previous studies that have demonstrated that most immigrants are motivated by the desire to maintain their traditional foodways and to reconstruct their social connection through engagement on the garden [8,50,51]. Additionally, the perceived health benefits reported by the participants, including access to fresh produce and physical activity, align with previous research on the role of community gardens' in embodied wellbeing and social integration of immigrants [2,3]. General interest and engagement in some form of gardening was high, however, in a situation where most participants lived in rented apartments with limited access to land, irrigation facilities, and other essential inputs, collective community gardens are perceived as community resources. Engagement in collective community gardening created opportunities for such individuals to experiment with traditional crop and vegetable varieties, maintain healthy foodways through reliable access to vegetables, and building social capital through neighborly connections. Such neighborly connections also support newcomer integration through meeting people, learning about Canadian culture and developing agricultural skills.

Despite the high interest and perceived benefits of collective community gardening. Analysis of the complex barriers to engagement uncovers interactions across levels of the socio-ecological model (SEM). At the individual level, time constraints emerge as a significant challenge, reflecting the broader challenges of immigrant families balancing multiple jobs and responsibilities.

Our findings on individual-level barriers revealed that gender roles and resource constraints influence interest in collective community gardening. It was observed that most of the participants in collective community gardening were female. The male participants' limited interest in gardening activities was related to cultural constructions of masculinity and provider roles [52,53]. Another factor is attitudes toward voluntary work or unpaid labor. We suggest that for more inclusive collective community garden programs, on the individual level, barriers including cultural perceptions about gender roles and voluntary work should be addressed through education. The high prevalence of "busy schedules" as a barrier shows the realities of life for many immigrants with multiple pressures competing for limited time and resources. The emphasis on financial pressures and childcare responsibilities reveals how individual barriers are often manifestations of broader structural inequity. Economic pressures create systemic barriers influencing such individuals' ability to engage in community-driven initiatives. Most participants lacking information about collective community gardening opportunities suggests current efforts may not effectively reach some immigrant communities, particularly recent arrivals. Language barriers reported by some participants is a significant barrier to resource navigation and accessibility. Such individual barriers that were identified also intersect with interpersonal dynamics in collective community gardens, where experiences of discrimination and cultural exclusion can create additional challenges to participation in this collaborative model.

Participants who were more interested or actively engaged in collective gardening often did so through existing community connections. Meeting people who share similar experiences and backgrounds emerged as a key motivation. Our analysis reveals two roles collective community gardens play: building social capital and knowledge exchange. Social capital facilitates initial access and supports knowledge transfer about growing food in Canada. These findings extend previous

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work by Kingsley et al. [27] on the role of social networks in immigrant food systems by demonstrating how these relationships play out in spaces of urban agriculture. Experiences of racial discrimination reported by some participants highlight how interpersonal dynamics can also create barriers to participation, even in ostensibly inclusive spaces. This finding adds nuance to existing literature on community gardens as sites of social integration [1,2,6,9,10,51], suggesting that without intentional attention to cultural sensitivity and inclusion, these spaces may inadvertently reproduce broader social and structural patterns of inequity. The subtle forms of exclusion reported by participants indicate the need for careful attention to such social dynamics for truly inclusive community spaces. Noteworthy is the emergence of collective gardens as potential sites for intercultural and intergenerational knowledge exchange. Addressing concerns raised in previous research about the loss of traditional food knowledge in immigrant communities [5,6,18,19,26,28]. However, realizing this potential requires careful attention to creating conditions that support meaningful cross-cultural and intergenerational exchanges [54].

In addition to personal and interpersonal dynamics that exist, barriers identified in the community-level of the socio-ecological model (SEM) uncovers how spatial placement and organizational dynamics influence accessibility. Our analysis of community-level factors reveals how representation, accessibility, and inclusive decision-making concerns shape interest and engagement in collective community gardening. We pay attention to how community-level barriers can interact with individual and interpersonal dimensions to create broader patterns of inclusion or exclusion. A particularly significant finding concerns the role of representation in community spaces. Participants valuing the presence of people from similar ethnic backgrounds resonates with what we term *cultural anchors* - points of connection with specific communities. This extends previous work by [1,25], demonstrating how cultural representation operates at both individual, interpersonal, and community levels for inclusive collective community gardens where immigrants of African descent can feel welcome. The organizational structure of collective gardens significantly influences participation. Non-participatory decision-making can create barriers to meaningful engagement. Such models may exclude certain perspectives, whereas inclusive decision-making processes that involve participants in determining what and how crops are grown can create welcoming spaces that reflect the diversity of experiences, traditions, and perspectives that enrich collective community gardens.

Edmonton's northern climate creates unique environmental constraints, particularly affecting the cultivation of tropical vegetables and herbs. Climate change impacts were increasingly evident, creating additional uncertainty around growing seasons and harvest outcomes. The short growing season characteristic of Alberta weather/climate posed specific challenges for growing vegetables that typically require longer growing periods. Limited access to irrigation facilities further complicated growing efforts, with participants noting challenges in maintaining consistent water access. The structural dimensions of environmental challenges became evident in our analysis. While Alberta's climate poses challenges for all gardeners, these impacts are disproportionately felt by immigrant communities attempting to grow culturally familiar tropical vegetables. Climate change further exacerbates these challenges, with increasing weather unpredictability particularly affecting those without access to protected growing spaces [55]. The combination of these environmental factors creates complex challenges that require gardeners to develop new skills and strategies.

Our analysis reveals how structural inequities create pervasive barriers that manifest across multiple ecological levels, fundamentally shaping immigrant experiences and interest in collective community gardening. These structural barriers operate through complex pathways, creating compound challenges that cannot be addressed through individual or community-level interventions alone.

For example, the study reveals how economic structures create pervasive barriers to participation on the garden. Despite high educational attainment among participants, many face significant employment challenges that directly affect their ability to engage in community gardening. This employment precarity reflects broader structural barriers in the labor market, where

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foreign credentials often go unrecognized, in addition to navigating other existing barriers to earning living wages. Financial struggle featured prominently as a factor, with participants navigating rising costs of living, unemployment, or underemployment, with many immigrants taking up multiple low-paying jobs to make ends meet. Such Individuals are forced to prioritize immediate needs, despite having a strong interest in collective community gardening. The economic pressures manifesting in our findings extend beyond individual circumstances to reveal systemic inequities. Rising costs of housing may have forced immigrant families to live far from existing community gardens, while limited access to reliable transportation compounds accessibility challenges.

Immigration policies and regulations (regulatory barriers) emerge as another significant structural barrier operating at multiple levels. Border control regulations severely restrict the importation of seeds, seedlings, and agricultural inputs from countries of origin for most immigrants. These restrictions have profound implications for maintaining traditional foodways and accessing culturally significant plant varieties as demonstrated by participant narratives. The regulatory environment around land use and urban agriculture creates additional structural barriers. Zoning restrictions, permit requirements, and insurance obligations can make it difficult for immigrant communities to establish new collective community gardens in their neighborhoods. These regulatory barriers disproportionately affect newcomer communities who may lack familiarity with local bureaucratic systems or face language barriers in navigating them.

Our findings reveal how systemic racism operates as a structural barrier affecting multiple aspects of garden participation. This manifests in both subtle and overt ways, from the distribution of garden infrastructure to decision-making processes about what should be grown. Systemic discrimination manifests across multiple levels, affecting both individual experiences and interactions. However, the impacts of systemic racism could also influence resource allocation, land use priorities, program design, and distribution of gardening infrastructure. Community gardens in Edmonton, like most cities in North America, show a pattern of concentration in predominantly non-immigrant neighborhoods, reflecting and reinforcing existing spatial inequities [8,20,33,37]. Furthermore, funding models and program requirements may fail to account for the specific needs and circumstances of immigrant communities, therefore, creating additional barriers to meaningful engagement. While community gardens have demonstrated benefits for neighborhood revitalization, the current structural environment creates pervasive barriers that exclude the communities that could benefit the most from collective community gardens. These structural barriers cannot be adequately addressed through individual-level interventions alone. While improved information sharing and culturally appropriate programming are important, meaningful change requires addressing the underlying systemic inequities that create barriers to participation. This might include policy changes around seed importation, investment in greenhouse infrastructure in immigrant neighborhoods, reform of land use regulations, and intensifying ongoing efforts to address economic and racial inequity.

## 5. Conclusions

This study provides novel insights into how Black African immigrants are navigating complex systems of barriers and facilitators to engagement in collective community gardening. Our findings demonstrate how various levels of the socio-ecological model (SEM); individual, interpersonal, community, environmental, and structural create interact dynamically rather than operating as discrete or hierarchical levels. These interactions manifest differently for individuals and communities. For example, where one participant's strong social connections helped overcome transportation barriers through carpooling, another's twelve-hour work shifts combined with childcare responsibilities made collective community garden participation unfeasible, even when they were accessible. Similarly, while some participants leveraged their community relationships to introduce culturally familiar vegetables into collective community gardens, others encountered resistance to growing non-European vegetables despite having plot access and gardening knowledge, illustrating how interpersonal dynamics and decision-making can amplify or mitigate

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structural barriers. Furthermore, barriers and facilitators are neither static nor universal but rather shift based on individual circumstances, community resources, and broader structural conditions.

Our analysis uncovers key contributions to the literature. First, we demonstrate how structural inequities manifest differently across layers of influence, and how these experiences vary based on individual circumstances. For instance, while "busy schedules" emerged as a common individual barrier, this often reflected broader structural challenges around employment precarity and economic pressures facing immigrant communities. Second, our findings highlight how social capital operates as both barrier and facilitator, with community connections simultaneously enabling garden access for some while reinforcing exclusion for others. Third, we identify how environmental constraints characteristic of Edmonton's Northern climate creates barriers for immigrants attempting to maintain healthy foodways through self-reliant community-driven efforts. The short growing season (May to mid-September) limits the cultivation of tropical vegetables that typically require longer growing periods. These conditions, coupled with increasingly unpredictable weather force gardeners to develop adaptive skills and techniques. The lack of protected growing spaces significantly constrains the potential of collective community gardens. The vulnerability of open-air gardens to weather extremes not only limits growing capacity but also creates additional risks of losing the harvest. Investment in community greenhouse infrastructure could extend the short growing seasons, protecting vegetables from increasingly volatile weather, and enabling year-round participation. Such infrastructure could transform collective community gardens from seasonal projects into sustainable, year-round spaces for food production, community building, and neighborhood revitalization. As Canadian cities become increasingly diverse, equitable access to collective community gardens becomes crucial for supporting immigrant well-being and social integration. This study contributes an accessible framework for understanding and addressing the complex barriers that can limit access for vulnerable communities, while highlighting opportunities for creating more inclusive and culturally responsive urban agriculture initiatives.

## 6. Limitations

Recruitment through community organizations may have underrepresented isolated or recent immigrants. However, this approach enabled access to participants from 13 African countries, providing diverse perspectives. Second, while findings from Edmonton may not generalize to other Canadian cities, our socio-ecological model (SEM) offers an accessible template for examining similar dynamics in other cities. Third, although focusing only on Black African immigrants excluded other immigrant groups, this targeted approach revealed important insights about sociocultural, and structural barriers faced by this growing yet understudied population.

**Supplementary Materials:** Data supporting reported results in this study are hoisted on the University Of Alberta Google Drive and are not publicly available currently but are available on request.

**Author Contributions:** Conceptualization and methodology, D.O. I.K, and E.O.; validation and formal analysis of data, D.O and E.O.; investigation, D.O., I.K., and E.O.; resources, D.O., I.K., and E.O.; data curation, D.O and E.O.; Writing—original draft preparation, D.O.; writing—review and editing, D.O and E.O.; supervision, E.O. and I.K.; project administration, E.O.; funding acquisition, E.O. and I.K. All authors have read and agreed to the published version of the manuscript.

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