



**Motivations individuelles dans la pratique de
l'agriculture urbaine dans les quartiers défavorisés :
trois cas de villes de différents contextes
socioéconomiques**

Thèse

Pierre Paul Audate

**Doctorat en aménagement du territoire et développement régional
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Sous la direction de :

Alexandre Lebel Ph.D., directeur de recherche
Geneviève Cloutier Ph.D., codirectrice de recherche

Résumé

Dans le contexte actuel de crise sanitaire et de changements climatiques, le rôle de l'agriculture urbaine apparaît de plus en plus essentiel dans le renforcement des systèmes alimentaires urbains. Sa diversité de formes et de fonctions suscite l'intérêt d'un ensemble hétérogène d'acteurs (citoyens, autorités municipales, professionnels de santé, aménagistes) dans les villes des pays du Nord, tout comme dans celles des pays du Sud, lesquelles évoluent dans des contextes socioéconomiques différents. Un grand nombre d'études a déjà exploré ses multiples bénéfices, actuels et potentiels, pour différents groupes d'acteurs urbains, incluant les pratiquants de l'agriculture urbaine, les urbanistes, les professionnels de santé et les autorités municipales.

Néanmoins, la prise en compte de l'agriculture urbaine dans les politiques publiques et l'aménagement des villes reste très limitée. Les caractéristiques et les impacts des initiatives et programmes d'agriculture urbaine (avec ou sans appui des autorités municipales), en constante augmentation dans nos villes depuis la dernière décennie, sont peu connus. Plusieurs acteurs évoluant dans des contextes socioéconomiques différents, dont les pratiquants de l'agriculture urbaine, jugent que la dimension alimentaire ne jouit pas de mesures politiques suffisantes dans la planification urbaine. Certaines études soulignent également les contraintes associées à l'agriculture urbaine et invitent à tenter de mieux comprendre ses caractéristiques.

Ces travaux mettent en évidence le peu de connaissances existantes sur les caractéristiques, les motivations des pratiquants, et sur les impacts des initiatives sur le cadre de vie urbain, sur le foncier, ou sur l'organisation locale. De plus, la recherche scientifique dans ce domaine fait parfois l'objet de critiques en raison de sa façon d'aborder les questions d'agriculture urbaine avec une approche productiviste ou de consommation développée dans les pays du Sud, et une approche post-productiviste ou multidimensionnelle privilégiée dans les pays du Nord.

Partant de ces constats, cette thèse en aménagement du territoire et développement régional porte sur les motivations individuelles dans la pratique de l'agriculture urbaine dans les quartiers défavorisés de trois villes évoluant dans des contextes socioéconomiques contrastés. Dans un premier temps, elle cherche à comprendre les impacts de l'agriculture urbaine sur la santé et ses déterminants. Dans un deuxième temps, elle questionne les caractéristiques et motivations des pratiquants de l'agriculture urbaine dans les milieux étudiés. Notre étude de cas multiples est de nature exploratoire et mobilise une approche qualitative combinant des données secondaires, tirées d'une revue systématique de littérature de type *scoping review*, et des données primaires collectées à travers un questionnaire et des entretiens semi-directifs dans les quartiers de Villeray et Parc-Extension à Montréal (Canada), Quitumbe et Turubamba à Quito (Équateur), et Martissant et Cité Soleil à Port-Au-Prince (Haïti). Au total 63 entretiens ont été réalisés soit, 52 auprès de pratiquants d'agriculture urbaine et 11 auprès de promoteurs d'agriculture urbaine.

Suivant l'introduction organisée en deux parties pour exposer les éléments de mise en contexte et éclaircir les concepts mobilisés, les résultats sont présentés dans le document sous forme d'articles scientifiques, correspondant à quatre chapitres indépendants mais complémentaires. Dans le premier chapitre, nous décrivons le protocole ayant guidé à la revue de littérature pour recenser les études portant sur les impacts de l'agriculture urbaine sur la santé et ses déterminants. Le deuxième chapitre présente les résultats de la revue systématique et identifie des lacunes dans la littérature traitant les impacts de l'agriculture urbaine. Parmi celles-ci, nous soulignons un manque d'analyse comparative et l'existence de limites dans la portée géographique de la recherche en agriculture urbaine. Dans le troisième chapitre, et en réponse aux lacunes précédemment mises en évidence, nous réalisons une analyse comparative des caractéristiques et motivations des pratiquants de l'agriculture urbaine à Montréal (Canada) et à Quito (Équateur). Les résultats de cette étude révèlent des similitudes et contrastes dans les motivations des pratiquants de ces deux contextes. Enfin, le quatrième et dernier chapitre approfondit le sujet en explorant le rôle de l'agriculture urbaine et les motivations des pratiquants dans la transformation de deux quartiers défavorisés de Port-Au-Prince (Haïti).

La thèse fait plusieurs apports théoriques, méthodologiques et pratiques sur la question de l'agriculture urbaine telle qu'abordée par l'aménagement du territoire. Elle contribue notamment aux discussions soulignant la nécessité de dépasser l'approche dichotomique Nord/Sud dans la recherche scientifique en agriculture urbaine. Par exemple, d'un côté la revue systématique met en évidence les dimensions alimentaires et non alimentaires de l'agriculture urbaine indépendamment du contexte socioéconomique (Chapitre 1). D'un autre côté, elle souligne le fait que les études en agriculture urbaine des pays du Sud particulièrement celles de la région d'Afrique Sub-saharienne tendent à explorer largement les questions de sécurité alimentaire en guise d'une approche holistique comme il en question dans les pays du Nord (Chapitre 2). Plus loin, on démontre qu'il soit à Montréal (Canada) ou à Quito (Équateur), la fonction nourricière des jardins peut avoir une grande importance aux yeux des pratiquants. De plus, au-delà de la fonction strictement nourricière, la qualité des aliments, leur signification pour celui qui les a plantés, leur rôle dans la construction de liens sociaux, sont complémentaires aux autres fonctions des jardins, indépendamment du contexte socioéconomique (Chapitre 3). Enfin, nous observons que les dimensions non alimentaires de l'agriculture urbaine (transformation des espaces détériorés, renforcement des relations sociales), déjà admises dans les pays du Nord, peuvent être tout aussi pertinentes que la dimension strictement nourricière pour les pratiquants haïtiens (chapitre 4).

Globalement, les résultats de la thèse suggèrent que l'agriculture urbaine est une composante indissociable de tout projet d'aménagement du territoire, et soulignent la nécessité de poursuivre la recherche sur les motivations individuelles en fonction du contexte socioéconomique.

Mots clés : Agriculture urbaine, motivations, quartiers défavorisés, déterminants de la santé, capital social, transformation des espaces, jardins communautaires, jardins collectifs, jardins familiaux, étude qualitative, Montréal, Quito, Port-Au-Prince.

Abstract

In the current context of health crisis and climate change, the role of urban agriculture appears increasingly essential in strengthening urban food systems. Its diversity of forms and functions arouses the interest of a heterogeneous group of actors (citizens, municipal authorities, health professionals, urban planners), in cities of both the Global North and the Global South with different socioeconomic contexts. Many studies have already explored its multiple current and potential benefits for different groups of urban actors which include urban agriculture practitioners, urban planners, municipal authorities, and health professionals.

However, the inclusion of urban agriculture in public policies and city planning is still limited. Little is known about the characteristics and impacts of urban agriculture initiatives and programs (with or without the support of municipal authorities), which have been constantly increasing in our cities over the past decade. Several actors from different socioeconomic contexts, including practitioners of urban agriculture, consider that the food dimension does not have enough political support in the urban planning. Some studies also draw attention to the constraints associated with urban agriculture and suggest to better understand its characteristics.

These studies highlight the little knowledge that exists on the characteristics and the motivations of practitioners and the impacts of such initiatives on the urban lifestyle, on land ownership, or on local organization. In addition, scientific research in this field is sometimes criticized because of addressing urban agriculture questions with a productivist or consumption approach developed in the Global South, and a post-productivist or multidimensional approach favored in the countries of the Global North.

Based on these observations, this PhD dissertation in urban planning and regional development focuses on individual motivations for urban agriculture practice in deprived neighborhoods of three cities evolving in contrasting socioeconomic contexts. First, we try to understand the impacts of urban agriculture on the health and its determinants. Second, we explore the characteristics and motivations of urban agriculture practitioners in the studied areas. Our multiple cases study is exploratory with a qualitative approach combining both secondary data from a scoping review and primary data collected through a questionnaire and semi-structured interviews in the neighborhoods of Villeray and Parc-Extension in Montreal (Canada), Quitumbe and Turubamba in Quito (Ecuador), and Martissant and Cité Soleil in Port-Au-Prince (Haiti). In total 63 interviews, of which 52 urban agriculture practitioners and 11 urban agriculture promoters, were conducted.

Following the introduction organized in two parts to expose the study context and to clarify the main concepts, the results are presented as four independent, but complementary chapters framed as scientific articles. The first chapter presents a scoping review protocol that guided the literature review to identify studies on the impacts of urban agriculture on health and its determinants. The second chapter presents the results of the scoping

review and identifies gaps in the literature on the impacts of urban agriculture. These gaps include a lack of comparative analysis and limitations on geographical scope regarding urban agriculture research. The third chapter attempts to fill these gaps by presenting a comparative analysis of the characteristics and motivations of the urban agriculture practitioners in Montreal (Canada) and Quito (Ecuador). The results of this study highlight similarities and contrasts in the motivations of urban agriculture practitioners in these two different contexts. Finally, the fourth chapter goes further to explore the role of urban agriculture and the motivations of practitioners in the space- to- place transformation of two deprived neighborhoods in Port-au-Prince (Haiti).

Our research makes several theoretical, methodological, and practical contributions on urban agriculture and urban planning. It contributes to the discussions on the need to go beyond the North / South dichotomy regarding urban agriculture scientific research. For example, on the one hand, the systematic review highlights the food and non-food dimensions of urban agriculture independent of the socioeconomic context (Chapter 1). On the other hand, it underlines the fact that studies on urban agriculture of the Global South, particularly those of Sub-Saharan Africa tend to largely explore the food security questions instead of a holistic approach as it is the case in the Global North (Chapter 2). Furthermore, we show that in Montreal (Canada) or in Quito (Ecuador), the food function of the gardens, is a very important motivation for the urban agriculture practitioners. Moreover, beyond the food function, the quality of the foods, their significance to the one who planted them and their role in the construction of social connections, are complementary to the other functions of the gardens independently of the socioeconomic context (Chapter 3). Finally, we observe that the non-food dimensions of urban agriculture (transformation of deteriorated spaces, strengthening of social relations) as already accepted in the Global North, can also be relevant to the Haitian practitioners, to a level similar to that of food dimension (Chapter 4).

Overall, the thesis findings suggest that urban agriculture is an important component for land use and urban planning projects and underline the need to continue research on individual motivations based on the socioeconomic contexts.

Keywords: Urban agriculture, motivations, deprived neighborhoods, determinants of health, social capital, place-making, community gardens, collective gardens, family gardens, qualitative study, Montréal, Quito, Port-Au-Prince

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Liste des abréviations, sigles, acronymes

AGRUPAR : Agricultura urbana participativa / Agriculture urbaine participative

AU : Agriculture urbaine

AUP : Agriculture urbaine et périurbaine

ATDR : Aménagement du territoire et développement régional

BMI: Body mass index

CATIE : Centre de recherche et d'enseignement en agronomie tropicale

CRAD : Centre de recherche en aménagement et développement

CERUL : Comité d'éthique de la recherche de l'Université Laval

CPUL : Continuous productive urban landscape

DMQ : Distrito metropolitano de Quito / District métropolitain de Quito

ESAD : École supérieure d'aménagement du territoire et de développement régional

FAO : Organisation des Nations Unies pour l'alimentation et l'agriculture

FOKAL : Fondasyon konesans ak Libète / Fondation Connaissance et Liberté

FRQS: Fonds de la recherche en santé du Québec

FRQSC : Fonds de Recherche du Québec - Société et culture

F&V: Fruit and vegetables

IAPS : Internationale de l'Association People Environnement Study

IHSI : Institut haïtien de statistique et d'informatique

IMC : Indice de masse corporelle

INEC : Instituto nacional de estadística y censos / Institut national de statistique et recensements

JMIR : Journal of Medical Internet Research

MeSH: Medical Subject Headings

MQV : Maison du quartier de Villeray

MUFPP : Milan Urban Food Policy Pact / Pacte de politique alimentaire urbaine de Milan

NoExp: No explosion (to restrict searches)

OCPM : Office de consultation publique de Montréal

OMS : Organisation mondiale de la santé

ONG : Organisation non gouvernementale

ONU : Organisation des Nations Unies

PICOS: Participants, Intervention or concept, Context, Outcomes, Study design

RAUQ: Réseau d'agriculture urbaine de Québec

RGS-IBG: Royal Geographical Society (with IBG)

SAKALA : Sant Kominote Altènatif Ak Lapè/ Centre Communautaire Alternatif et Paix

Tiab: Title and abstract

UA: Urban agriculture

US: United States

UK: United Kingdom

*J'aimerais prendre un moment pour
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mère madame Ludger Audate née Marie-
Mercie Gabriel qui a fait trop tôt le voyage
vers le repos éternel et à toute ma famille...
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Avant-propos

Cette thèse marque la fin d'une belle aventure qui a commencé un beau matin du 8 septembre 2016. Arrivé à Québec avec un désir acharné de m'initier dans la recherche et un financement de quatre-ans assuré pour mon projet d'études; j'avoue, je ne savais pas pour autant à quoi ressembleraient ces quatre merveilleuses années qui se sont achevées avec ces lignes compilées dans des paragraphes que vous êtes en train de lire en ce moment. Évidemment, comme toute belle expérience, le chemin de cette aventure doctorale en aménagement du territoire et développement régional est parsemé de bons et mauvais moments. Mais avant de présenter aux lecteurs avisés que vous êtes, la démarche scientifique qui a guidé le parcours, laissez-moi d'abord vous exposer le contexte qui a vu naître l'idée d'entreprendre cette aventure.

Mon intérêt pour l'agriculture urbaine se situe à l'intersection de deux ensembles constitués de mes formations académiques et professionnelles. En effet, après le secondaire j'avais vite compris que l'agronomie était l'une des disciplines dont la pertinence et la mode n'auront jamais une date d'expiration, car tout être vivant aura toujours le besoin de se nourrir. Or c'est grâce à l'agriculture et de ses révolutions qu'on produit les aliments nécessaires à la survie des populations. C'est cette idée simpliste qui m'a poussé à entreprendre des études en sciences agronomiques à l'Université EARTH au Costa Rica. Par la suite, cette Université a éveillé en moi à la fois la curiosité scientifique et le désir acharné de transformer les connaissances en pratique et du même coup changer les conditions de vie des moins favorisés. C'est à l'Université EARTH que j'ai appris aussi l'existence d'une relation symbiotique entre l'agriculture et la santé. Comme projet de graduation en 2010, je me suis mis à investiguer les plantes inhibitrices de l'uréase — une enzyme présente dans le sol qui catalyse la réaction de transformation d'un engrais azoté l'Urée. C'est à ce moment-là que je me suis rendu compte que l'uréase est aussi présente dans le corps humain et peut provoquer de graves problèmes de santé. Au-delà du secteur agricole, la découverte de plantes avec un pouvoir inhibiteur de l'uréase pourrait servir à l'industrie pharmaceutique dans le développement de nouveaux médicaments. Voilà une autre raison qui m'a motivé à passer de longues heures aux laboratoires de l'Université pour terminer ce projet de recherche. En effet, j'avais vite compris qu'au-delà des aspects du secteur agricole mes travaux pourraient influencer aussi la santé des populations en générale.

Finies les études en agronomie, j'ai décidé de retourner dans mon pays natal pour apporter ma contribution à la lutte perpétuelle pour le changement des conditions de vie de la population. Arrivé là-bas, j'ai beau vouloir mettre en application ces connaissances scientifiques que j'ai acquises dans les laboratoires. Mais malheureusement, il y avait très peu d'opportunités dans le milieu de la recherche en Haïti. D'ailleurs, ce manque flagrant d'opportunités persiste encore aujourd'hui. Même les plus grandes universités du pays n'ont pas le financement nécessaire pour la recherche. Ainsi, j'ai décidé de mettre sur pause ma passion pour la recherche

et du même coup faire appel à mon sens d'engagement social pour commencer une carrière dans un projet de développement. Ce projet m'a du coup appris qu'on ne change pas le monde seulement avec les connaissances sinon ça prend aussi des interventions pour passer de la théorie à la pratique. On aura beau inventer des connaissances avec la recherche mais s'il n'y a pas la compétence pour traduire le savoir en du réel, on n'arrivera pas à changer les conditions de vie des populations.

Imprégné de cet esprit de vouloir changer des conditions de vie des populations, j'ai décidé en 2013 de retourner au Costa Rica pour faire une maîtrise en Pratique de développement, cette fois au Centre de recherche et d'enseignement en agronomie tropicale (CATIE). Ces études ont ouvert mes yeux sur les inégalités existantes dans chacun des systèmes (alimentaire, santé, éducation etc.) qui devraient renforcer notre société. C'est alors que je me suis mis à penser qu'on ne pourra jamais résoudre tous les problèmes sociaux en même temps mais chacun doit faire un choix pour ajouter sa goutte de solution dans l'océan des problèmes qui nous entourent. Le mien était clair, j'ai voulu ajouter ma goutte dans l'océan des problèmes du système agro-alimentaire. Suivant mes études de maîtrise, je suis retourné en Haïti et j'ai travaillé comme directeur technique dans une organisation à but non lucratif qui avait des projets de développement dans diverses filières agricoles. Ces projets agricoles continuent d'avoir un impact très positif dans les conditions de vie des communautés rurales du département du Nord d'Haïti. Ils sont aussi pour moi une marque de fierté professionnelle puisque je me réjouis d'avoir participé au changement de conditions de vie de plusieurs dizaines de petits agriculteurs. La seule chose que ces projets n'ont pas réussi à faire, c'est d'éteindre en moi la flamme de cette envie de continuer à faire de la recherche.

Animé par cette curiosité scientifique en 2016, j'ai pris la décision de me lancer dans cette aventure doctorale. J'avoue que l'aménagement du territoire et développement régional n'était pas mon premier choix de programme. En effet, je connaissais peu cette discipline et je voulais retourner dans les sciences naturelles. Mais en apprenant à découvrir le programme et l'aspect de son interdisciplinarité, je me suis dit que le fruit du hasard s'est arrangé de mon côté. C'est à l'École supérieure en aménagement du territoire et développement régional (ÉSAD) et son centre de recherche affilié le CRAD de l'Université Laval que j'ai passé mes meilleurs moments dans la recherche et j'ai renforcé mes habiletés à penser de façon critique. Si j'avais à resoumettre ma candidature d'admission à nouveau, je choiserais sans doute l'aménagement comme première option avec les yeux fermés. C'est une discipline qui se retrouve à l'intersection de la recherche et de la pratique. Donc, ma passion pour la recherche et mon désir ardent de contribuer aux changements du système agro-alimentaire font de cette discipline mon parcours idéal. Je ne regrette pas d'avoir fait de l'ÉSAD ma maison d'apprentissage dans mon aventure doctorale ces quatre dernières années.

Mais le chemin pour arriver à la fin de cette aventure n'était pas toujours facile. Je me rappelle la première chose qui m'a frappé le premier jour, c'était de voir le nombre de publications scientifiques affichés dans les tableaux à l'extérieur des bureaux des professeurs de l'ÉSAD. Je me demandais si un jour j'allais arriver à publier un article scientifique et être cité par d'autres chercheurs. Voilà quatre ans et quelques mois après cette thèse sur les motivations individuelles dans la pratique de l'agriculture urbaine dans milieux moins favorisés, est la preuve comme dit le dicton que à l'impossible nul n'est tenu. Le nombre de citations associées à mes travaux est passé de 0 à plus d'une vingtaine sur *Google Scholar* pendant cette période.

Cette thèse représente pour moi un travail ardu qui a été l'occasion d'approfondir mon questionnement sur les réalités des mouvements émergents du système agro-alimentaire. Elle se veut être une contribution à l'avancement des connaissances sur la pratique de l'agriculture dans les milieux urbains moins favorisés. Voilà une dichotomie qui met déjà au défi mon questionnement. En effet, les enjeux de l'agriculture et l'urbanisation ont été historiquement présentés comme deux élèves d'une même classe mais qui ne s'assoient pas sur le même banc. L'agriculture était perçue plutôt comme un phénomène rural, n'ayant pas sa place dans l'aménagement des villes. Par contre, de nos jours ces enjeux ont évolué et l'agriculture s'est installée aussi dans le cadre bâti de nos villes. Il revient aux urbanistes et planificateurs urbains de savoir comment l'intégrer.

Le travail présenté dans ce document a été réalisé sous la direction de Dr. Alexandre Lebel et la codirection de Dr. Geneviève Cloutier. Deux professeurs avec des expertises différentes mais complémentaires. Le premier étudie les aspects de santé publique dans l'aménagement avec une approche quantitative tandis que l'autre regarde les aspects institutionnels et la participation citoyenne. Donc, ne soyez pas surpris si toutefois vous voyez que la thèse profite de cette richesse savante et un peu de créativité pour refléter cette interdisciplinarité. Les deux professeurs ont joué un rôle prépondérant dans l'encadrement du travail et le document a grandement profité de leur richesse intellectuelle. J'ai à mon tour réalisé tout le travail de conception, collecte et traitement des données. La publication de quatre articles scientifiques comme premier auteur dans des revues avec comité de lecture constitue pour moi la colonne vertébrale autour duquel le travail de thèse est charpenté.

Le document de thèse comprend une introduction générale qui fait une mise en contexte, présente la problématique et éclaircit des concepts utilisés, quatre chapitres présentés sous forme d'articles scientifiques rédigés en anglais, une conclusion générale montrant comment l'agriculture urbaine peut incarner un changement pour la revitalisation des quartiers urbains défavorisés. Les articles présentés ont été publiés ou sont déjà soumis pour publication dans des revues avec comité de lecture et sont organisés de manière que chacun puisse être consulté indépendamment du document de thèse.

Le premier chapitre présente l'article intitulé *Impacts of Urban Agriculture on the Determinants of Health: Scoping Review Protocol*, publié dans la revue *Journal of Medical Internet Research (JMIR)* au mois de mars 2018. Cet

article aborde l'aspect méthodologique de la recension des écrits pour une revue systématique de type *scoping review* qui a été réalisée dans le cadre de cette thèse.

Le second chapitre est un article publié dans la revue *BMC Public health* au mois de mai 2019. L'article a pour titre : *Scoping review of the impacts of urban agriculture on the determinants of health*, et présente les résultats de la revue systématique de la littérature qui contribue à l'enrichissement du cadre théorique de la thèse. Les résultats de cette étude ont été présentés dans plusieurs conférences scientifiques internationales. On peut citer entre autres la conférence annuelle du *Royal Geographical Society (RGS-IBG-2019)* à Londres (Royaume Uni). La 9^{ème} conférence internationale des études alimentaires à Kaohsiung (Taïwan) où le prime *Emerging scholar* 2019 a été obtenu en octobre 2019.

Intitulé *Motivations des pratiquants de l'AU dans les quartiers défavorisés : Étude comparative entre Montréal et Quito*, le troisième chapitre est un article en anglais publié dans la revue *Urban forestry & Urban greening*, (*Elsevier*) au mois de mai 2021. Cette étude présente des regards croisés entre les motivations des pratiquants de l'agriculture urbaine à Montréal (Canada) et Quito (Équateur). Les résultats de cette étude ont été aussi présentés dans des conférences internationales dont la 26^{ème} conférence internationale de l'Association *People Environment Study* (IAPS-2020).

Le dernier chapitre est un article en anglais intitulé *Role of urban agriculture in the space-to-place transformation: Case study in two deprived neighborhoods, Haiti*. Cet article est en révision pour publication dans la revue *Cities* (*Elsevier*). Il présente l'AU comme un outil qui contribue à la transformation des espaces détériorés en milieu de vie dans les quartiers défavorisés de Port-Au-Prince.

Je finis cette partie en vous remerciant d'avoir pris le temps de consulter ce document. Bien qu'il représente une petite partie de cette aventure doctorale, j'ose espérer que sa lecture comblera vos attentes. Cela dit, l'aventure doctorale est un ensemble infini d'activités et d'expériences professionnelles dont on ne pourra jamais raconter dans un document de thèse. Souvent, l'effort déployé dans les autres activités n'est pas moins ardu que le contenu du document en soi.

Sur ce je vous souhaite une très bonne lecture.

Introduction

Partie I

Mise en contexte et problématique

La fin de la deuxième et le début de la troisième décennie du XXI^e siècle sont marqués par des bouleversements socio-spatiaux tels que l'urbanisation grandissante à l'échelle mondiale, les changements climatiques, l'utilisation accrue des automobiles et l'accroissement des écarts de richesse. Plus récemment, nos sociétés ont également dû faire face à la crise sanitaire mondiale du coronavirus. Tous ces défis nous incitent à porter un regard particulier sur le cadre de vie urbain, et notamment à questionner le rapport à la nature et le potentiel de production agricole dans nos villes. Aujourd'hui, la proportion de la population mondiale vivant en milieu urbain continue d'augmenter. Elle est passée de 37% en 1975 à 48% en 2015 et devrait, selon les estimations, atteindre plus de 55% d'ici 2050 [1]. Cette urbanisation grandissante soulève des enjeux en termes d'espace puisqu'elle favorise l'étalement urbain, qui pourrait à son tour hypothéquer l'avenir des espaces agricoles situés à proximité des villes. Elle soulève aussi des interrogations sur la capacité de ces dernières à répondre aux défis alimentaires, souvent négligés lors de leur aménagement par le passé [2]. Ces préoccupations amènent de nombreux planificateurs urbains contemporains à développer l'idée d'une ville nourricière, qui, bien que la production alimentaire apparaisse à première vue compliquée du fait de la densité des espaces urbains, n'est pas sans fondements.

En effet, si depuis l'époque de la révolution industrielle l'agriculture a été considérée comme un élément rural n'ayant pas sa place dans le paysage urbain, elle a suscité ces dernières années l'intérêt des populations urbaines qui l'utilisent comme une activité multifonctionnelle et intersectorielle [3, 4]. Désignée sous l'appellation agriculture urbaine (AU), elle est ainsi pratiquée à différentes échelles (grands et petits lots ou espaces), sous différentes formes (individuelle, collective), avec des objectifs différents (commerciaux, non-commerciaux), dans les espaces urbains. Cette multiplicité de formes et d'objectifs amène à questionner le rôle et la place des pratiquants de cette forme d'agriculture dans le projet de production alimentaire urbaine et durable. Au-delà de l'activité de loisir qu'elle est dans certains cas, la culture de plantes nourricières en milieu urbain peut-elle constituer une ressource économique et socio-sanitaire significative ?

Plusieurs études théoriques [5-9] et empiriques [10-13] présentent l'AU comme une activité attrayante qui apporte de nombreux bienfaits et bénéfices aux villes et à ses habitants. D'ailleurs, un grand nombre de villes de tailles variées développent cette pratique en l'inscrivant dans leur plan de développement [14] ou en l'intégrant dans leurs schémas prospectifs d'approvisionnement alimentaire [15]. Le milieu de la recherche s'intéresse également au développement de l'AU, qui pourrait inspirer de nouvelles pratiques d'aménagement

des villes contemporaines. Depuis quelques années, des planificateurs urbains intègrent en effet ce type d'agriculture dans l'aménagement des villes [16, 17]. Néanmoins, les paramètres et les indicateurs pour l'élaboration de cadres conceptuels et méthodologiques rigoureux en matière de recherche sur les thématiques touchant l'AU restent à développer [18].

Plusieurs acteurs, dont les pratiquants de l'AU, jugent que la dimension alimentaire ne jouit pas de mesures politiques suffisantes dans la planification urbaine [15, 19-21]. Certaines études [22, 23] attirent également l'attention sur les contraintes associées à l'AU et invitent à tenter de mieux comprendre ses caractéristiques puisque le nombre d'initiatives d'AU ne cessent d'augmenter dans les villes des pays à revenu élevé comme dans celles des pays à revenu moyen et faible, et ce, avec ou sans appui des autorités municipales.

L'augmentation des initiatives d'agriculture en milieux urbains met en évidence le peu de connaissances existantes sur les caractéristiques et les impacts de ces initiatives sur le cadre de vie urbain, sur l'organisation locale, ou sur le foncier. Comment l'AU telle que pratiquée dans les villes des pays à revenu élevé, moyen, et faible, s'opérationnalise-t-elle ? Qui en sont les acteurs, les bénéficiaires, les porteurs ? Comment affecte-t-elle les conditions de vie et l'alimentation des individus qui la pratiquent ? Ces questions sont au centre de notre problématique et ont guidé le cheminement de cette thèse sur les motivations individuelles dans la pratique de l'AU et leurs implications pour les futures politiques publiques, notamment les politiques alimentaires des villes.

La compréhension des motivations des pratiquants de l'AU requiert avant tout une meilleure conceptualisation de la notion même d'AU, qui ne fait pas toujours consensus en raison de la diversité de formes et fonctions que revêt cette pratique. D'un point de vue sémantique (agriculture et ville), l'AU renvoie à une activité consistant à utiliser de petites surfaces urbaines pour cultiver des plantes et élever des animaux en vue d'une consommation domestique ou d'une vente de proximité [24]. Cette définition datant des années 90, a été utilisée, dans les pays à revenu moyen et faible, par les agences de développement comme l'Organisation des Nations Unies pour l'alimentation et l'agriculture (FAO). Elle s'inscrit dans une perspective de sécurité alimentaire, assumant ainsi le rôle indéniable de l'AU sur la santé. En revanche, elle semble justifier une critique souvent faite à la recherche en AU, à savoir d'être ancrée dans une approche productiviste dans les pays à revenu moyen et faible [25]. À l'inverse, dans les pays à revenu élevé, si l'AU est également abordée dans ces aspects de production et de sécurité alimentaires, la recherche met davantage l'accent sur ses atouts environnementaux et sociaux, voire politiques ou d'engagement citoyen [26].

Les définitions du concept ont évolué au fil du temps pour inclure les dimensions spatiales, environnementales et sociales de l'AU. Parmi les définitions couramment utilisées figure celle de Moustier et Mbaye [27], qui met en relation deux éléments a priori antagonistes (agriculture et ville). Les auteurs envisagent l'AU dans son environnement et la définissent comme :

« l'agriculture localisée dans la ville et à sa périphérie, dont les produits sont destinés à la ville et pour laquelle il existe une alternative entre usage agricole et urbain (non agricole) des ressources ; l'alternative ouvre sur des concurrences, mais également sur des complémentarités entre ces usages : foncier bâti et foncier agricole ; eau destinée aux besoins des villes et eau d'irrigation ; travail non agricole et travail agricole ; déchets ménagers et industriels et intrants agricoles ; coexistence en ville d'une multiplicité de savoir-faire due à des migrations, cohabitations d'activités agricoles et urbaines génératrices d'externalités négatives (vols, nuisances) et positives (espaces verts) » (p. 8).

La définition de Nahmias et Le Caro [28], quant à elle, insiste sur la dimension sociale de l'AU et éclaircit le concept sur ses caractéristiques, sa localisation, ses acteurs, et sur sa diversité de formes et de fonctions. Cette définition, qui nous semble la plus complète et que nous utiliserons dans la suite de ce travail, présente l'AU comme :

« l'agriculture pratiquée et vécue dans une agglomération par des agriculteurs et des habitants aux échelles de la vie quotidienne et du territoire d'application de la régulation urbaine. Dans cet espace, les agricultures – professionnelles ou non, orientées vers les circuits longs, les circuits courts ou l'autoconsommation – entretiennent des liens fonctionnels réciproques avec la ville (alimentation, paysage, récréation, écologie) donnant lieu à une diversité de formes agri-urbaines observables dans le ou les noyaux urbains, les quartiers périphériques, la frange urbaine et l'espace périurbain » (p.13).

Cette définition permet de distinguer une AU professionnelle, pratiquée par des agriculteurs ou fermiers, le plus souvent dans une perspective commerciale, et une AU sociale pratiquée par des citoyens et amateurs dans des perspectives diverses. Tandis que l'AU professionnelle utilise la technologie pour maximiser la production d'aliments frais qui nourrissent les habitants de la ville, l'AU sociale, de son côté, incarne plusieurs fonctions (recréation de liens avec la nature, loisir, revendication citoyenne, contact social, ou une sorte de réponse à un manque d'infrastructures de distribution de produits frais) (ibid.). Dans la plupart des pays du monde, cette AU sociale est généralement pratiquée dans les quartiers moins favorisés des grandes villes, sous forme de jardins potagers individuels ou familiaux, jardins communautaires ou collectifs. D'un point de vue sociologique, elle est souvent portée ou propulsée par des personnes ou organisations provenant de milieux similaires, partageant les mêmes valeurs et réflexions par rapport au système alimentaire mondial actuel [29]. Ces personnes et organisations se constituent préférentiellement en mouvements citoyens, plus ou moins organisés, avec des aspirations ancrées dans des principes de lutte contre les inégalités sociales pour favoriser une société plus équitable. Contrairement aux agriculteurs professionnels, les pratiquants de

cette forme d'agriculture ne sont pas nécessairement reconnus par le monde agricole. Dans un grand nombre de cas, ils sont également absents du cadre institutionnel d'aménagement urbain établi.

Ces mouvements d'AU, souvent portés par des organisations municipales ou non-gouvernementales, sont très présents dans de nombreuses villes d'Amérique du Nord et du Sud telles New York, Montréal et Quito. Ces deux dernières, avec Port-Au-Prince, nous intéressent particulièrement et ont été retenues comme terrains d'étude dans le cadre de cette thèse.

Montréal, Quito et Port-Au-Prince, trois villes du continent américain, présentent des statuts socioéconomiques différents et sont des cas que nous avons jugés intéressants pour analyser et contraster l'ampleur et l'évolution de l'AU dans les quartiers moins favorisés. À Montréal, les deux quartiers centraux que sont Villeray et Parc-Extension – considérés parmi les moins favorisés du territoire montréalais – se distinguent par une pratique active de l'AU. À noter qu'il y a 150 ans, ces deux quartiers étaient des territoires agricoles. Au cours du XXe siècle, ils ont perdu une grande partie de cette tradition agricole sous l'influence de l'industrialisation et l'urbanisation [30, 31]. Néanmoins, l'intérêt pour les pratiques agricoles continue d'exister dans la zone. Dans son Plan local de développement durable 2011-2015, l'arrondissement de Villeray-Saint-Michel-Parc-Extension s'était engagé notamment à soutenir les initiatives d'AU [32]. Aujourd'hui, l'AU s'y développe sous différentes formes à travers des initiatives individuelles, des jardins communautaires ou collectifs, appuyés tant par des organisations à but non lucratif que par la municipalité. Parmi les organisations qui travaillent dans des projets d'AU, nous retrouvons des organisations associées à des banques alimentaires comme La Maison du Quartier de Villeray (MQV), qui gère environ une quinzaine de jardins collectifs (ibid.). Mentionnons aussi l'organisme Alternatives qui, avec son projet « Nourrir la citoyenneté », intervient directement à Villeray. Des organismes environnementaux comme le Vrac-Environnement soutiennent également des jardins collectifs dans le quartier du Parc-Extension et les regroupements des trois écoquartiers Villeray, Saint-Michel et Parc-Extension organisent des interventions d'AU (jardins collectifs).

Dans le cas de Quito, l'AU est pratiquée particulièrement dans les quartiers de la zone sud, considérés comme les moins favorisés de la ville. Cette agriculture y est présente sous différentes formes : jardin familial, communautaire et institutionnel. Les initiatives à caractère familial ou communautaire sont impulsées dans une perspective de production alimentaire pour l'autosubsistance ou la commercialisation. Plusieurs de ces initiatives reçoivent l'appui du projet AGRUPAR (Agriculture urbaine participative) et représentent une source de revenu secondaire pour les familles [33].

Enfin, en ce qui concerne la ville de Port-Au-Prince, bien que le problème de l'espace soit un facteur limitant pour le développement de l'AU dans les quartiers défavorisés et densément peuplés, des organismes non-

gouvernementaux (ONG) y ont déjà mis en place des initiatives d'AU, notamment dans les quartiers de Cité Soleil, de Carrefour-feuilles et de Martissant. Ces projets ont pour objectif, selon leurs promoteurs, de contribuer à l'autonomie alimentaire des résidents des quartiers. Cependant, cette vision, qui s'exprime dans les discours, peine à se concrétiser dans les faits.

Certains auteurs soulignent en effet qu'un grand nombre de ces pratiques sont le fait de porteurs externes, parfois ignorants de la réalité de la vie des résidents de ces quartiers [34]. Ceci peut limiter la participation et le soutien de la communauté locale aux mouvements, alimentant ainsi un décalage culturel [35]. Par exemple, Alkon et McCullen [36] montrent que les déconnexions entre l'activisme de l'AU et la communauté locale se produisent à travers des différences ethniques et culturelles — dans ce cas précis, au niveau de la préférence pour des types particuliers d'aliments. Des travaux antérieurs ont cherché à comprendre dans quelle mesure l'offre alimentaire des promoteurs de l'AU s'ancre dans les valeurs, les traditions ou comportements alimentaires des populations des quartiers moins favorisés des grandes villes (Ibid.). Améliorer la compréhension de ces enjeux permettra une meilleure interprétation du niveau d'implication de la population locale dans ces projets.

Les mouvements d'AU portés par les organismes locaux dans les quartiers moins favorisés font également face à un manque de structure et d'homogénéité qui peut limiter l'appui technique, financier et la reconnaissance de ces mouvements. Par exemple, à Montréal, les jardins collectifs bénéficient d'un support moindre que les jardins communautaires, qui sont eux encadrés par la municipalité. Chaque groupe (MQV, VRAC-environnement) fonctionne de manière indépendante et est chargé de déterminer son propre mode de fonctionnement et sa structure. Certains travaillent avec des écoles ou des particuliers, donc de manière complètement indépendante de la municipalité. Le point d'achoppement de ce *modus operandi* est lié à la question foncière. Dans certains cas, les initiatives sont établies sur des terrains vacants sans autorisation formelle ou engagement à long terme du propriétaire, ce qui crée une insécurité foncière. Cela dit, s'il faut reconnaître ces initiatives comme représentatives de projets d'intervention pour le développement social et urbain des quartiers, il apparaît nécessaire de chercher à mieux comprendre leur organisation, notamment pour mieux les encadrer.

À Quito et à Port-Au-Prince, les organismes tendent à mettre en avant l'idéal d'une autonomisation alimentaire et accordent peu d'attention au côté social des initiatives, contrairement à ce qui est fait par les acteurs montréalais. En ce sens, une analyse croisée des initiatives menées en contexte socioéconomique élevé (Montréal) et en contexte socioéconomique moyen ou faible (Quito, Port-Au-Prince) offre la possibilité de comprendre les relations complémentaires entre les fonctions alimentaires et sociales de l'AU, ce qui est la contribution visée par notre recherche.

Plan général de la thèse

Cette recherche doctorale s'appuie sur une revue systématique de la littérature de type *scoping review* (ou *examen de la portée*) et sur une étude de terrain menée dans trois pays présentant des contextes socioéconomiques différents. Outre l'introduction et la conclusion, la thèse est constituée de quatre chapitres présentés sous forme d'articles indépendants mais complémentaires. Les deux premiers chapitres correspondent aux résultats de la revue de littérature systématique. Ils ont pour objectif de préciser l'état des connaissances scientifiques sur notre sujet et d'identifier et de positionner les cadres théorique et méthodologique qui structureront la partie empirique de la thèse. Les deux derniers chapitres présentent les méthodes détaillées et les résultats des recherches empiriques réalisées sur les trois terrains d'étude. Les paragraphes suivants décrivent brièvement le contenu de chacun des quatre chapitres susmentionnés.

Les revues systématiques de littérature sont un type d'étude permettant de synthétiser la littérature sur un sujet donné suivant une stratégie de recherche documentaire systématique [37, 38]. Le chapitre 1 est un protocole de revue systématique qui présente une stratégie de recherche documentaire originale et répliquable. Ce protocole vise à répertorier des études pour dresser un portrait général de la littérature sur les impacts de l'AU sur les déterminants de la santé. Il explique pourquoi une revue systématique a été préférée à d'autres types de revue de littérature et présente la feuille de route et les outils permettant d'identifier les sources de données qui traitent des impacts bénéfiques et négatifs de l'AU sur les déterminants de la santé. Cette recension d'écrits constitue l'ancrage théorique et méthodologique de notre thèse.

Le chapitre 2 présente les résultats de la revue de littérature sur les impacts de l'AU sur les déterminants de la santé. Les études identifiées permettent de dresser un état des lieux de la diversité des méthodes utilisées dans la recherche scientifique en AU et la concentration de cette recherche aux États-Unis et en Afrique Sub-saharienne. La revue de littérature met en évidence que les recherches menées jusqu'alors ont permis de documenter les impacts bénéfiques de l'AU sur un ensemble de facteurs influençant la santé tandis que les impacts négatifs restent peu connus. Cette revue systématique de la littérature souligne des lacunes dans la recherche en AU, et particulièrement le manque d'analyse croisée portant sur des villes présentant des contextes socioéconomiques différents. Ce constat a motivé notre choix de mener une étude comparative de Montréal et Quito (chapitre 3).

Le chapitre 3 porte un regard croisé sur les caractéristiques et motivations des individus qui pratiquent l'AU dans des quartiers défavorisés (2 quartiers par ville) à Montréal (Canada) et à Quito (Équateur). L'objectif de ce travail est de mettre en lumière une typologie de pratiquants. Les résultats de cette étude ont permis d'observer des similitudes et différences entre les motivations dans ces deux contextes socioéconomiques contrastés. Si dans les quartiers de Montréal, l'AU est perçue comme un projet personnel visant l'amélioration de la santé mentale

et le renforcement du capital social – relations interpersonnelles, et avec les organisations du milieu, à Quito, ce sont l'aspect économique de l'AU comme moyen de subsistance du ménage et son influence sur la santé physique qui sont mis en avant. L'ensemble des éléments communs et divergents observés dans cette étude attestent de l'effet positif indéniable de l'AU sur les déterminants de la santé des pratiquants. Ils soulignent aussi son potentiel dans la revitalisation des milieux urbains défavorisés.

Le chapitre 4 porte sur une étude de cas réalisée dans deux quartiers défavorisés de Port-Au-Prince (Haïti), à savoir Martissant et Cité Soleil. Les projets d'AU réalisés dans cette ville, sont souvent présentés comme visant un apport alimentaire significatif dans un contexte de pénurie, cependant, ils présentent une forte ressemblance avec des outils de transformation des espaces en milieux de vie. L'étude de cas montre comment l'AU pratiquée dans ces quartiers dépasse la vision alimentaire réductrice des promoteurs et peut être perçue comme une intervention jouant un rôle prépondérant dans la transformation des espaces ou la transformation de l'image des quartiers aux yeux des pratiquants de cette activité.

La dernière partie présentant les conclusions de la thèse résume les apports de notre travail en faisant une synthèse de l'argumentaire des quatre chapitres précédents. Elle clarifie le potentiel de l'AU dans la transformation des quartiers défavorisés des grandes villes. Elle présente également les limites et implications de nos travaux et ouvre sur des perspectives pour de futures recherches et interventions en aménagement du territoire.

Partie II

Les concepts mobilisés : agriculture urbaine, déterminants de la santé, et la transformation de l'espace

Avant de présenter les objectifs de notre travail, il convient de définir les concepts qui y sont mobilisés et qui ont contribué à préciser nos questionnements et à situer cette étude dans la littérature existante. Ce cadre conceptuel repose sur trois notions : l'agriculture urbaine (AU), les déterminants de la santé et la notion de transformation de l'espace.

Perspective historique de l'agriculture urbaine

Bien qu'elle soit souvent décrite comme un mouvement en émergence dans de nombreuses villes, l'AU est étroitement liée à la fondation même des villes [39]. Pour mieux comprendre son évolution, il faut remonter à l'existence des pratiques de jardinage ou à la présence de végétal cultivé dans les villes, ce qui n'est pas un phénomène récent. En effet, depuis les civilisations antiques de la Grèce et des Mayas, les citadins ont toujours cherché à satisfaire le besoin de nature dans la ville. Si la pratique de l'AU s'inscrit dans cette longue tradition de jardinage en milieu urbain, elle se distingue toutefois par sa nature, ses fonctions et son intention de

réalisation [40]. En effet, alors que le jardinage est souvent motivé par une volonté ornementale, l'AU relève d'une volonté de production agricole. Ils se rejoignent néanmoins sur l'utilisation du jardin comme lieu de concrétisation de leur pratique (ibid.). Le jardinage urbain apparaît comme un trait d'union entre la ville et le milieu agricole qui la nourrit. Sans mettre en doute la probabilité de la présence de pratiques agricoles dès la création des villes, nous fixerons le début de notre exploration historique à la période de la Grèce antique, où les pratiques agricoles et de jardinage étaient communes dans de nombreuses villes européennes. À cette époque, des vignes, des légumes et des fruits étaient cultivés dans les sanctuaires urbains afin de pourvoir à la subsistance des moines et pèlerins [41]. En Amérique, dans la civilisation Maya, les jardins collectifs occupaient une place centrale dans les villes et étaient considérés comme des analogies de l'organisation spatiale de l'univers [42].

Le Moyen Âge est aussi une époque pendant laquelle les pratiques agricoles dans les villes étaient fréquentes. Les espaces agricoles et les zones de maraîchage urbains étaient encouragés afin de conserver la dimension nourricière de la ville [28]. La présence de jardins et d'espaces verts donnait également aux villes de cette époque un aspect rural très marqué [43, 44], ce qui a donné lieu à une caractéristique particulière de la ville médiévale européenne, qui reflétait la vie à la campagne [41]. Au XIII^e siècle, dans la capitale de l'empire romain, à Constantinople, les agrosystèmes urbains formaient des réseaux complexes impliquant différents groupes et structures organisationnelles pour la production alimentaire à travers le jardinage domestique, l'élevage ou la production d'autres cultures [42]. L'histoire des jardins botaniques est également un exemple non négligeable de la coexistence de la ville et de son agriculture. En effet, les voyages des explorateurs européens du XVI^e siècle, qui ont permis la découverte de nouvelles espèces de plantes exotiques provenant d'Amérique et d'Asie, ont présidé à la création des jardins botaniques au sein des centres urbains, ayant pour fonction de cataloguer ces nouvelles espèces. Ces espaces sont à l'origine de nouvelles habitudes chez les populations, comme la promenade, qui reflète une nouvelle relation entre humain, ville et nature [41]. À partir de cette époque (XVI^e siècle), le rapport étroit entre ville et nature allait prendre de l'ampleur. En effet, le concept de jardin s'invite dans la planification urbaine avec notamment des projets d'envergure comme le château de Versailles en France [45].

Au XIX^e siècle, l'exode rural engendré par la révolution industrielle provoque des mutations sans précédent dans les pratiques urbanistiques et agricoles. La révolution industrielle a en effet entraîné une poussée démographique très conséquente et une croissance spatiale accélérée dans de nombreuses villes occidentales [46]. Elle a également favorisé la rupture entre les citadins et la campagne, en réduisant notamment la part de végétal en ville [47]. Les quartiers ouvriers étaient en effet constitués d'habitations souvent insalubres ne laissant que très peu d'espace pour installer un jardin. Néanmoins, ce même contexte d'urbanisation forcée et chaotique,

produit de la révolution industrielle, a soulevé des préoccupations hygiénistes et incité une génération de penseurs à se focaliser sur le rôle du végétal dans l'amélioration du cadre de vie urbain (ibid.).

Ainsi, le besoin de contact avec la nature redevient rapidement une préoccupation pour la population de cette époque [48]. La montée en puissance de l'urbanisme hygiéniste entraîne la création de jardins ouvriers dans les quartiers industriels. Cette nouvelle forme d'aménagement répond non seulement à la vision utopique du modèle progressiste des urbanistes de l'époque mais traduit aussi un certain retour de la campagne à la ville [47]. Cette (ré)intégration de la campagne à la ville s'exprime également dans d'autres modèles urbanistiques, particulièrement les modèles naturaliste et culturaliste avec les travaux d'Ebenezer Howard sur la cité-jardin (ibid.). La cité-jardin évoque la proximité entre l'habitat et les lieux de travail, mais exprime surtout une pensée nostalgique d'une coexistence symbiotique de la ville et la campagne [49].

Les Première et Deuxième Guerres mondiales sont aussi marquées par des pratiques agricoles dans les villes. En Europe et en Amérique du Nord, par exemple, l'histoire du jardinage communautaire entretient des liens étroits avec des mouvements tels que « *Dig for Victory* » ou « *Victory gardens* », qui étaient impulsés par les gouvernements nationaux pour encourager les citoyens à produire leurs propres aliments en ville pendant la guerre [50]. À cette époque, la fonction alimentaire de l'agriculture urbaine est aussi importante que celle de contact avec la nature.

La période d'après-guerre, caractérisée par la mécanisation de l'agriculture, la croissance économique, et l'émergence de la société de consommation, a mené à d'autres formes de pratiques agricoles (*Guerilla gardening*, *ruelles vertes*). Après la guerre, les produits agroalimentaires redeviennent certes disponibles, mais la remise en question du modèle agroalimentaire se combine désormais à une conscience écologique citoyenne. Cette préoccupation socio-politique donne lieu à des mouvements d'appropriation des espaces publics vacants prônant le retour ou le maintien du végétal en ville, afin de produire de la nourriture ou simplement de verdir la ville [51]. Progressivement, les fonctions de l'AU s'élargissent : elle devient aussi un instrument politique. À titre d'illustration, l'activiste Liz Christy lance dans les années 70, à New York, le mouvement de la guérilla jardinière pour embellir un terrain laissé en friche. La guérilla jardinière s'avère une forme visible de contestation et d'appropriation des espaces laissés vacants par l'administration municipale. Elle indique la volonté des citoyens de voir la ville promouvoir une meilleure utilisation des friches industrielles. Ce mouvement s'est ensuite étendu un peu partout dans le monde et il continue de mobiliser les citoyens (Ibid.).

Bien que des relations étroites entre la ville et les pratiques agricoles soient documentées depuis l'Antiquité, le concept d'agriculture urbaine est relativement récent dans le milieu de la recherche. Il a fallu attendre la fin des années 1980 et le début des années 1990, avec notamment le regain d'intérêt pour l'AU dans l'agenda de développement des pays du Sud, pour que la recherche commence à s'y intéresser et à mieux appréhender

cette pratique. Aujourd'hui, la diversité des formes et fonctions que revêt l'AU s'inscrit dans une volonté de nourrir la ville, de la verdir et d'améliorer la qualité de vie des citoyens. Dans certains contextes, elle est ancrée dans une recherche d'alternative au système alimentaire traditionnel. Notons que les prémices de l'AU comme mouvement demeurent néanmoins un champ de recherche relativement vierge. L'apparition récente d'entreprises commerciales ou de fermes urbaines qui profitent de la vague d'intérêt pour cette activité témoigne d'ailleurs de la nécessité d'approfondir la compréhension des enjeux sociaux, environnementaux, économiques et politiques de l'activité. Mount et Andrée [52] soulignent quelques défis majeurs pour la recherche en AU comme le manque de compréhension de la complexité des pratiques ou le manque d'équilibre dans les nuances. Ils pointent également la diversité dans les approches étudiant les différences et similitudes des pratiques existantes (jardinage communautaire ou collectif, fermes urbaines, potagers). Ils suggèrent des études pour approfondir et représenter visuellement les réseaux de pratiques de l'AU. Ces réseaux brouillent souvent les frontières entre les rôles et responsabilités des gouvernements, du secteur privé, des organismes à but non lucratif, ou du public en général. Il y a matière à s'interroger sur la manière dont l'objet « AU » reflète une gouvernance territoriale en transformation.

Grandes orientations de la recherche en AU

Bien que la littérature sur le sujet soit peu abondante et relativement récente, l'AU bénéficie de l'héritage d'une recherche multidisciplinaire établie, qui englobe le jardinage et le verdissement urbain. En effet, l'AU est un objet de recherche complexe, qui regroupe une grande diversité de pratiques comme le jardinage communautaire, le jardinage collectif, les fermes urbaines, les potagers urbains et scolaires, la guérilla jardinière. Elle est étudiée dans diverses disciplines comme la géographie, l'aménagement, la sociologie, la santé publique ou l'agronomie. Plusieurs études théoriques et empiriques ont déjà suscité l'intérêt des chercheurs, qui ont mis en exergue les attributs et contraintes de ces différentes formes de pratique d'AU. Dans cette section, nous présenterons une liste non exhaustive des approches à l'intersection desquelles se situe le corpus bibliographique de l'AU comme objet de recherche. Ces approches sont au nombre de trois. La première approche est celle de la santé et de la sécurité alimentaire (1); la deuxième aborde l'AU dans sa dimension socio-spatiale (2); et la troisième et dernière approche est celle de la « ville écologique », qui traite l'AU sous l'angle de l'aménagement, de la planification urbaine et des politiques publiques (3). Si les études et initiatives émanant de ces différentes approches constituent des apports intéressants, elles soulèvent également un ensemble de questions sur lesquelles nous reviendrons dans chacune des sections ci-dessous.

Agriculture urbaine : une approche par la santé et la sécurité alimentaire

Plusieurs travaux contemporains abordent l'AU dans une perspective de santé et de sécurité alimentaire. Les auteurs analysent notamment sa contribution à l'accès aux aliments de qualité, à la diversité nutritionnelle et son influence sur d'autres déterminants de la santé (statut nutritionnel, bien-être). Selon ce courant de

recherche, l'AU contribue à l'accès à des aliments de qualité en favorisant la consommation d'aliments sains et frais comme les fruits et légumes [10, 22, 53]. Elle participe également à la diversité alimentaire et nutritionnelle [13, 54], et permet de lutter contre la pauvreté dans certains contextes socioéconomiques [55]. Un consensus général existe selon lequel un environnement alimentaire composé de jardins communautaires et de fermes urbaines serait parmi les solutions à un accès inadéquat à la nourriture dans les villes [56, 57].

L'influence de l'AU sur la situation économique des individus et des ménages est aussi mise en avant dans cette approche [54, 58]. Selon Korth et al. [58], l'AU augmente le revenu des individus et des ménages grâce à la vente des surplus de production, et permet de réduire les dépenses alimentaires [59]. En résumé, ces études considèrent que l'AU joue un rôle bénéfique non négligeable dans l'accès à des aliments de qualité au niveau individuel et au niveau des ménages.

Bien que l'AU puisse augmenter la disponibilité des fruits et légumes, l'accès ou l'utilisation de ces produits est influencé par d'autres caractéristiques individuelles ou déterminants – enfants ou adultes, en emploi ou au chômage, en sécurité ou insécurité alimentaire. De plus, les données probantes quant au rôle de l'AU dans la sécurité alimentaire des individus ou des ménages ne sont pas concluantes. Certains auteurs mettent en garde contre une surestimation de la contribution de l'AU à la sécurité alimentaire [60]. Au sein des pays à revenu élevé, la relation entre l'AU et la sécurité alimentaire des pratiquants n'est pas établie. Au sein des pays à revenu moyen et faible, particulièrement en Afrique la plupart des études ont cherché à démontrer ses liens avec la sécurité alimentaire [61, 62], ce qui limite l'AU à un outil de développement utilisé par des ONGs. Loin de nier cette contribution potentielle de l'AU au développement des sociétés, il est possible que cette perspective néglige la contribution potentielle de l'AU à l'amélioration de la diète des résidents urbains dans les pays à revenu élevé, où elle pourrait aussi s'avérer importante, toutefois, aucune étude ne rapporte clairement cette hypothèse.

Les impacts négatifs de l'AU en matière d'enjeu alimentaire et de santé publique ont également été étudiés par les chercheurs et professionnels étudiant les enjeux de santé dans l'aménagement du territoire. Des études sur les questions liées à la sécurité sanitaire, la contamination des aliments, ou la propagation de maladies dues aux pratiques d'agriculture dans le milieu urbain, ont été menées un peu partout dans le monde au cours des vingt dernières années [63-65]. Si, dans les pays à revenu élevé, certains auteurs ont exploré le sujet de la contamination des sols par les métaux lourds [66-68], la préoccupation, pour les pays à revenu plus modeste, porte principalement sur la question des maladies liées à l'usage des eaux usées et des déchets dans les pratiques d'AU [69, 70]. En effet, les sols où se pratique l'AU sont souvent situés dans des espaces résiduels, soit des friches industrielles soit à proximité d'infrastructures pouvant être source de contamination pour les produits cultivés. Une étude réalisée par Antisari et al. [22] retrouve des concentrations d'environ 160-200 mg

par kg de métaux lourds dans des légumes cultivés près des infrastructures routières, alors que les légumes cultivés en zone rurale comptent habituellement environ 1 ou 2 mg par kg. Notons cependant que la corrélation entre les sols contaminés et la contamination des produits de l'AU n'a pas encore été totalement établie puisque, la culture des plantes dans des sols contaminés ne reflète pas toujours la concentration de métaux lourds dans les produits cultivés [71]. Néanmoins, la décontamination des sols, préalablement à la pratique de l'AU, est souvent exigée par les municipalités.

Dans des pays à revenu moyen et faible, cette préoccupation est reléguée au second plan et l'inquiétude porte sur la transmission potentielle de maladies en raison de l'utilisation des eaux usées ou des déchets dans l'AU [69, 70]. La représentation et la hiérarchisation des enjeux de santé publique liés à l'AU varient donc considérablement en fonction du contexte socioéconomique du pays.

L'AU est aussi abordée dans la littérature pour ses apports aux problèmes de santé physique, mentale et sociale des individus et de leurs communautés. Par exemple, une méta-analyse réalisée par Soga et al. [72] montre que le jardinage, considéré comme une forme d'AU lorsque pratiqué en milieu urbain, a des effets sur différents aspects de la santé comme l'indice de masse corporelle (IMC) (santé physique), le stress, l'anxiété (santé mentale), et le contact social. Bien que les pratiques de l'AU ne soient pas toujours étudiées pour leurs bénéfices sur l'activité physique, il a été démontré que le jardinage est l'une des formes d'exercice privilégiées selon l'âge, le sexe ou l'origine ethnique [73] et qu'il a une influence positive sur l'IMC [74] et la santé cardiovasculaire [75].

De même, les études sur la pratique du jardinage à des fins thérapeutiques montrent que l'AU contribue à différents aspects de la santé des individus. Des études sur le jardinage quotidien ont déjà constaté que ceux qui le pratiquent développent moins de stress et de dépressions que ceux qui n'en font pas [76]. Les bienfaits du jardinage sur la santé émotionnelle des jardiniers ou des personnes âgées ont également été démontrés [77-79]. Les bénéfices démontrés du jardinage et sa proximité avec l'AU nous amènent à formuler la question suivante : quels sont les impacts de l'AU sur la santé des individus qui la pratiquent ? Évidemment, trouver une réponse à une telle interrogation peut ouvrir sur plusieurs hypothèses dont la vérification serait difficile. Nous nous limiterons donc à explorer l'hypothèse de la variabilité de la perception des impacts de l'AU sur les déterminants de la santé selon le contexte socioéconomique.

L'approche socio-spatiale de l'agriculture urbaine

En plus de son association à des dimensions alimentaire et sanitaire, l'AU est appréhendée dans une approche socio-spatiale qui utilise l'alimentation comme une métaphore pour aborder des problèmes sociétaux. Dans ce cas, l'AU devient une expression idéologique urbaine. Les travaux réalisés dans cette perspective touchent deux éléments intimement liés : le territoire et l'alimentation.

L'approche socio-spatiale s'intéresse à l'appropriation de l'AU par des mouvements citoyens. Les études mettent en évidence deux tendances dans le corpus bibliographique. La première aborde l'AU dans une perspective de justice alimentaire [29] et la seconde présente l'AU comme une forme d'expression politique ou d'appropriation de l'espace public [80, 81].

Dans le cas de la justice alimentaire, l'AU est utilisée comme un instrument de lutte contre les iniquités sociales. Les instigateurs de ce mouvement utilisent le discours des droits humains à l'effet que chaque citoyen a le droit de s'alimenter dignement [82]. Les actions et les interventions qui s'inscrivent dans ce courant ciblent des populations historiquement victimes du système alimentaire conventionnel, particulièrement les minorités ethniques, les immigrants et les habitants des quartiers défavorisés des régions métropolitaines [29]. L'AU est considérée alors comme une solution pour répondre aux besoins alimentaires des groupes qui vivent dans les quartiers défavorisés, et contribuant au développement d'un accès alimentaire équitable.

En effet, il est commun de retrouver des initiatives d'AU dans des endroits où les habitants ne peuvent pas se procurer des aliments à des prix abordables [83]. D'autres initiatives cherchent plutôt à promouvoir l'AU comme un outil permettant de renforcer les liens sociaux. Dans les pays à revenu moyen et faible, la question du genre est abordée dans cette littérature, comme outil de renforcement des liens sociaux particulièrement pour les femmes [84], au-delà de son influence sur l'économie des ménages. Notons que les confirmations empiriques de ces arguments restent à établir. Dans les pays à revenu élevé, les initiatives visent spécifiquement des immigrants, qui sont souvent motivés à faire de l'AU en raison de leur expérience préalable dans l'agriculture.

En milieu défavorisé, les retombées positives des initiatives d'AU ne bénéficient pas toujours aux populations les plus pauvres, qui sont pourtant initialement ciblées [85]. Certains auteurs cherchent en effet à comprendre si l'AU pratiquée dans une perspective de justice alimentaire ne participe pas, dans certains cas, au renforcement des iniquités sociales qu'elle cherche à surmonter [86]. Ainsi, comme l'a montré Reynolds [87] dans la ville de New York, la diversité des acteurs impliqués dans l'AU ne se traduit pas forcément par l'éradication des iniquités sociales ou des disparités ethniques existantes dans les structures sociétales. Des observations similaires ont été faites dans d'autres villes où les initiatives d'AU sont initiées par des citoyens écologistes éduqués qui, a priori, ne font pas partie des groupes défavorisés ciblés par la justice alimentaire [88]. Il est donc opportun de se poser la question des bénéficiaires des initiatives d'AU dans les quartiers défavorisés. Est-ce que ces initiatives renforcent les liens sociaux ou génèrent-elles plutôt un sentiment d'exclusion ? Quelle est la place de la fonction alimentaire dans ces initiatives, qui s'inscrivent dans l'agenda des promoteurs de la justice alimentaire ? Bien que ces questions soient pertinentes elles dépassent le cadre de cette thèse.

Le deuxième argumentaire de l'approche socio-spatiale prend comme point de départ l'enjeu foncier qui est un facteur important, aussi bien pour les pratiquants que pour les chercheurs de l'AU, puisque les villes font souvent face à des pressions immobilières. Dans une telle perspective, le problème de l'accès à la terre devient une préoccupation. Si certaines études comme celle de Badami et Ramankutty [55] s'attardent à étudier les contraintes ou opportunités auxquelles sont confrontés les citoyens pour l'accès à des espaces urbains pour produire des aliments, d'autres abordent la question foncière sous l'angle de l'appropriation citoyenne de l'espace [89] et questionnent la légitimité des mouvements portés par des groupes plus ou moins organisés, comme les « *Green Guerrillas* » ou « *Guerrilla Gardening* », qui s'approprient des espaces libres ou friches industrielles des villes pour produire des aliments ou verdir les quartiers. Leurs actions sont une protestation contre la désertion de certains espaces urbains. Cette forme d'AU, illégale, pratiquée par des citoyens qui colonisent ces espaces sans autorisation, existe dans les pays à revenu élevé comme dans les pays à revenu moyen et faible [90].

Dans le premier cas, ces mouvements sont souvent inspirés de formes historiques de contestation publique, comme celui des « *Diggers* » en Angleterre, dont la finalité était de lutter contre un système qui privait les paysans de leurs droits d'usage des terres communales [48]. Dans le second cas (pays à revenu moyen et faible), les initiatives citoyennes observées sont une forme de désobéissance par rapport aux interdictions imposées par des autorités qui n'encouragent pas toujours la production alimentaire dans le milieu urbain [89].

Ces mouvements, en forte évolution, n'ont pas encore été pleinement étudiés. Jusqu'à récemment, certaines pratiques agricoles étaient ne sont pas autorisées dans certaines villes et la réglementation juridique de l'AU demeure floue dans de nombreux pays [89]. De plus, les motivations et les caractéristiques de ces mouvements restent peu connus. Comment ces formes d'appropriation évoluent-elles avec le temps ? Cette appropriation de l'espace entre-t-elle en conflit avec d'autres types d'usage ? Quelle est son influence sur la planification territoriale et l'urbanisme ? Certes, ces questionnements ne sont pas au centre du projet de thèse, cependant ils sont intéressants dans la compréhension des enjeux de l'AU dans les villes contemporaines.

Des travaux montrent que les intentions motivant les initiatives citoyennes de jardinage tendent à évoluer vers une réinterprétation du rapport nature-ville et vers une production alimentaire plus affirmée. Par exemple, le mouvement déjà évoqué du « *Green Guerrillas* », initié à New York dans les années 70, consistait initialement à jeter des semences de plantes dans des espaces urbains inutilisés afin d'embellir la ville. De nos jours, il s'oriente davantage vers la sensibilisation des citoyens aux bénéfices des jardins communautaires [89]. Ainsi, ces mouvements, portés par les citoyens, créent de nouvelles dynamiques urbaines qui méritent d'être étudiées. Bien que la plupart cherchent à partager l'espace réapproprié, dans un esprit de bien commun, ce n'est pas toujours le cas, et l'espace récupéré devient parfois un cercle fermé, réservé à un petit groupe (ibid.). Quel est

donc le mode de gestion des espaces appropriés ? Quels moyens faut-il engager pour les préserver ? Comment décrypter les motivations des acteurs afin d'éviter que l'espace public approprié ne soit pas accaparé par un seul groupe d'individus ? Ces questions ouvrent des pistes pour de futures recherches, lesquelles pourront s'appuyer sur les contributions de notre travail doctoral.

Une approche de ville écologique

Un troisième courant de recherche inscrit l'AU dans le récit de la ville écologique, en incluant l'agriculture et le verdissement dans l'agenda de l'aménagement urbain. Certains auteurs utilisent le concept d'« agriurbanisme », ou d'urbanisme agricole, pour décrire ce courant et les principes qui le sous-tend, dont la théorie principale met en relation territoire, alimentation et santé [91]. Cette approche s'exprime par une volonté de repenser la ville en y intégrant la dimension alimentaire.

Bien que la prise en compte de l'agriculture dans l'urbanisme ne soit pas un phénomène récent [47], ce n'est qu'à partir des années 2000 que celle-ci a commencé à attirer l'attention des chercheurs en aménagement et en planification urbaine [2].

Par exemple, l'idée des fermes verticales s'est répandue dans plusieurs pays comme une pratique d'aménagement futuriste pour alimenter le monde. Dans leur livre « *Continuous Productive Urban Landscape (CPUL)* », Viljoen et Howe [92] font un plaidoyer pour l'introduction du paysage productif dans les infrastructures urbaines, tout en présentant l'AU comme une intervention pouvant améliorer l'environnement bâti des villes. À partir de 2011, des auteurs comme Verzzone et Dind [93] ont commencé à évoquer la notion d'urbanisme alimentaire. Cette dernière ne se limite pas à la production agricole dans les démarches urbanistiques, elle vise le système alimentaire dans son ensemble comme étant un élément essentiel de l'organisation du cadre bâti.

D'autres chercheurs ont étudié les caractéristiques de l'AU pour proposer son intégration dans les politiques d'aménagement urbain [94]. L'influence de ces travaux dans l'agenda alimentaire des villes commence à se ressentir. En effet, depuis 2015, plus d'une centaine de villes ont signé le Pacte de politique alimentaire urbaine de Milan [14]. Ce pacte vise à encourager les villes dans leurs démarches pour développer des systèmes alimentaires urbains durables. En signant ce pacte, les élus locaux des villes reconnaissent le rôle indéniable de l'AU dans l'alimentation et la protection de la biodiversité des villes. Ils s'engagent du même coup à développer des plans pour encadrer sa pratique et supporter les pratiquants. Les signataires se réunissent annuellement pour faire le point sur les travaux déjà engagés et échanger des idées visant à encourager et expérimenter de nouvelles pratiques.

Un autre groupe d'études de ce corpus bibliographique associé à la ville écologique, met en valeur les attributs environnementaux de l'AU pour justifier sa place dans la planification urbaine [16, 95]. Cette dimension

environnementale est précisée par le rôle de l'AU comme espace vert favorable à l'intégration des fonctions écologiques dans la ville. Si les études portant sur la contribution de l'AU à la régularisation des températures ne font pas encore l'objet d'une reconnaissance unanime, un consensus se dessine sur le rôle de l'AU dans le recyclage des déchets en milieu urbain [96]. L'AU, à travers l'augmentation du taux d'humidité qu'elle génère, contribue également à la réduction des îlots de chaleur [3]. Si de plus amples études empiriques doivent être menées pour étayer ces affirmations, il est d'ores et déjà démontré que l'AU facilite la réutilisation des déchets urbains grâce au compostage et à l'irrigation des eaux de ruissellement [96]. En outre, un ensemble d'études met en garde contre certaines pratiques d'AU qui peuvent avoir des effets négatifs sur l'environnement urbain, par exemple mauvais entretien des sites de compostage ou des eaux d'irrigation, peut favoriser des problèmes de santé [69].

En somme, les constats généraux pouvant se dégager de ces trois grandes approches (santé et sécurité alimentaire, socio-spatiale, et ville écologique) du corpus bibliographique de l'AU sont multiples. Ces études théoriques et empiriques sur notre objet de recherche donnent des pistes de réflexion utiles pour comprendre la diversité des formes d'AU qui existent dans les villes ainsi que la pluralité de leurs retombées. Toutefois, elles ne sont pas révélatrices des profils des participants à cette pratique.

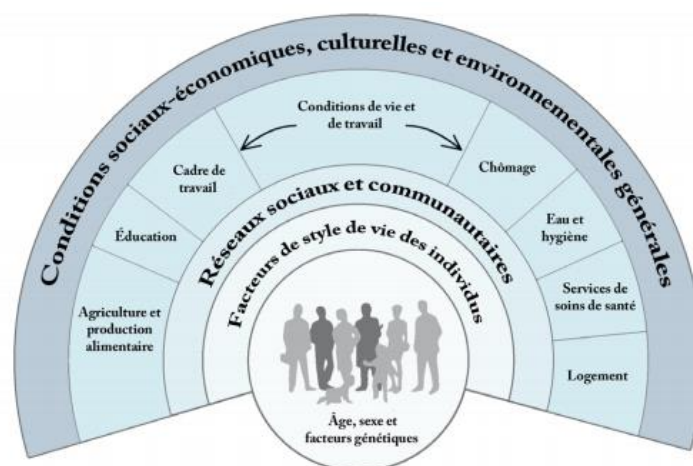
De plus, la littérature existante ne permet pas de comprendre comment des facteurs propres aux contextes socioéconomiques des pays influencent le développement de l'AU, ni même de distinguer la contribution de ces mêmes facteurs aux motivations individuelles. Les études menées jusqu'à présent ne permettent pas non plus de tirer de conclusions cohérentes sur la durabilité de l'AU [97, 98]. En pratique, nous savons que plusieurs initiatives d'AU déployées dans les quartiers défavorisés reçoivent des financements et des appuis non monétaires de la part des ONGs ou des municipalités pour soutenir leurs activités. Cependant, nous en savons peu sur la durabilité de ces mécanismes de financement. Le financement est-il un élément incitatif qui permet la pérennisation de l'AU en milieu défavorisé ? Quelles conditions motivent les pratiquants et pratiquantes à rester engagés dans le développement de l'AU en milieu défavorisé ? Cet engagement dans l'AU influence-t-il leur bien-être, leur santé ou leur cadre de vie ? Quels sont les facteurs qui influencent la durabilité des initiatives en AU ? Toutes ces questions démontrent la pertinence de la problématique que nous proposons dans le cadre de cette recherche et qui porte sur l'exploration des motivations individuelles.

La notion des déterminants de la santé

Bien que l'organisation mondiale de la santé (OMS) ait, depuis sa création, défini la santé dans une approche holistique comme « un état de complet bien-être physique, mental et social et ne [consistant] pas seulement en une absence de maladie ou d'infirmité » [99 p.1], pendant longtemps, la santé a été perçue et étudiée sous l'angle d'une approche biomédicale, comme une absence de maladies [100]. Cette approche implique une

perspective corrective plutôt que préventive : l'apparition de la maladie est le déclencheur de l'action curative. Pourtant, Ashton et Ubido [101] citent des travaux réalisés par Thomas McKeown dans les années 70 et qui montrent que les techniques curatives ne sont pas le seul facteur de bonne santé. Cette dernière dépend d'un ensemble de paramètres liés à l'environnement, l'hygiène et le mode de vie, et qui contribuent à réduire la prévalence des maladies et leurs effets.

Au Canada par exemple, depuis le rapport de Lalonde en 1974 [102], les problèmes de santé ne sont plus abordés sous le seul angle du modèle biomédical. Ils sont plutôt inscrits dans une approche holistique qui consiste à prendre en considération un ensemble de facteurs comme la génétique humaine, l'environnement, les conditions socioéconomiques, les habitudes de vie et l'organisation des soins de santé [100]. Ainsi, les interventions de promotion de la santé, réalisées en amont et ciblant les déterminants de la santé (Fig.0-1) plutôt que les symptômes, sont encouragées.



La figure présente un modèle de l'influence des déterminants de la santé qui permet de voir comment les divers facteurs d'influence sur la santé s'imbriquent dans de plus larges sphères de la société.

Source : Mikkonen, J. et Raphael, D. (2011). Déterminants sociaux de la santé : les réalités canadiennes. Toronto : École de gestion et de politique de la santé de l'Université York. Adapté de: Dahlgren, G. et M. Whitehead (1991). Policies and Strategies to Promote Social Equity in Health. Stockholm Institute for Futures Studies.

Figure 0-1 Modèle des déterminants de la santé

Les déterminants de la santé regroupent tous les facteurs individuels, sociaux, économiques et environnementaux qui influencent la santé d'un individu, ou d'une population. Bien que ces facteurs ne soient pas toujours des causes directes, ils sont utiles pour orienter les interventions. Par exemple, le fait de vivre en milieu défavorisé constitue un important déterminant de la santé mais ne signifie pas que l'individu y vivant va nécessairement développer une pathologie [103].

Par ses multiples fonctions (alimentation, verdissement, relations sociales, génération de revenus), l'AU influence indirectement la santé des individus ou des populations [104]. Comme mentionné dans la section précédente, plusieurs études théoriques et empiriques ont déjà abordé différents bienfaits et méfaits de l'AU sur la santé [74, 105-107]. Cependant, ce vaste champ de connaissances sur l'influence de l'AU sur la santé fait parfois l'objet de critiques, certains résultats étant qualifiés d'anecdotiques [61, 62]. Ces critiques peuvent être justifiées par le manque d'outils, et rigueur méthodologique permettant d'évaluer les impacts de l'AU sur la santé. D'où l'importance de synthétiser les données disponibles pour mieux orienter la recherche d'outils capables d'évaluer de manière rigoureuse les impacts de l'AU sur la santé et ses des mécanismes sous-jacents. De telles synthèses permettraient d'avoir une meilleure compréhension des retombées du mouvement de l'AU dans les milieux moins favorisés, qui font face à une multitude d'enjeux et qui ont un besoin constant d'interventions pouvant transformer l'espace et contribuer à améliorer la qualité de vie des résidents.

La notion de transformation de l'espace

Les notions d'espace et de lieu sont particulièrement intéressantes dans la compréhension des retombées de l'AU sur la santé, le bien-être et la qualité de vie des personnes. En effet, l'espace est un concept multidimensionnel, matériel ou physique, du moins dans sa dimension géographique, puisqu'il présente différentes formes urbanistiques et différents modes d'usages [108]. Il renvoie également à un lieu de sociabilité ou à une expérience vécue du point de vue sociologique et de l'expérience humaine [109]. La manière d'occuper ou d'utiliser l'espace se traduit par la notion d'appropriation de ce dernier [110]. Ainsi, dans sa dimension physique, l'espace peut être dégradé (friches industrielles), réapproprié, transformé ou revitalisé pour faire émerger de nouvelles formes d'usage.

Dans cette perspective, Ripoll et Veschambre [111] présentent trois formes d'usage qui peuvent émerger à la suite de l'appropriation de l'espace : une forme d'usage exclusif, une forme d'usage autonome, et une forme de contrôle par le pouvoir. L'usage exclusif fait référence à un espace approprié par un individu ou un groupe en limitant l'accès avec des frontières physiques. Citons l'exemple des jardins communautaires de Montréal, clôturés par une grille et dont l'accès est cadenassé. Seules les personnes sélectionnées par les responsables y ont accès. Les jardins collectifs, pour leur part, sont plutôt des espaces ouverts offrant davantage de liberté d'usage. Ils incarnent l'idée de l'usage autonome puisque les usagers sont libres de décider de réaménager cet espace ou de lui donner une autre finalité. Enfin, le contrôle par le pouvoir renvoie à l'idée de certaines restrictions ou interdictions d'usage de l'espace.

La notion d'appropriation est aussi une construction idéologique, liée à un processus d'attribution de sens à un espace. Sous cet angle, l'usager développe un sentiment d'appartenance ou d'attachement identitaire à l'espace

(ibid.). Autrement dit, l'espace devient un lieu chargé de sens, qui influence les actions, comportements et perceptions des groupes et des individus [112, 113].

En s'appuyant sur ces deux dimensions (physique et idéale) de l'espace [111], il est possible de considérer que l'AU, dans sa dimension socio-spatiale est une forme d'appropriation de l'espace urbain. Par exemple, dans nos milieux d'étude, l'AU prend la forme d'un jardin qui n'est autre chose qu'un espace de rencontre entre différents individus et différents modes de pensée. Parfois, cet espace aménagé en jardin révèle une identité individuelle ou collective, qui influence les actions et aspirations des pratiquants et pratiquantes. Il peut aussi devenir un espace politique pour exprimer un besoin ou une revendication [114, 115]. En somme, cette interprétation nous incite à aborder les jardins d'AU comme lieux d'expression d'une relation entre espace, individu et communauté, pouvant procurer du confort et du bien-être mais aussi des tensions dans les quartiers défavorisés. Par ailleurs, en mettant les pratiquants et leurs besoins au centre de la conception des jardins visant à transformer les quartiers défavorisés, les activités d'AU peuvent s'aligner aux principes de la transformation des espaces détériorés en milieu de vie « *place-making* ». Le dernier chapitre de la thèse présente ce concept et ses principes.

Cadre de la thèse

Questions de recherche

L'AU se situe donc au carrefour des enjeux de santé publique et d'aménagement du territoire. Toutefois, très peu d'études se sont attardées à comprendre comment elle touche à la fois à la santé et à l'amélioration du cadre de vie des quartiers moins favorisés des grandes villes. De plus, il n'existe pas, à notre connaissance, d'analyses comparées de villes avec des statuts socioéconomiques différents. Nous manquons de connaissances pour comprendre la rhétorique de la variabilité des motivations dans la pratique de l'AU. Il est possible que l'importance de l'aspect productif des jardins, par rapport au renforcement du capital social¹, soit surévalué dans les pays avec un statut socioéconomique moyen et faible et sous-évalué dans les pays avec un niveau de revenu élevé. Ces réflexions nous ont amené à formuler les questions principales et secondaires suivantes, qui structureront notre travail de recherche :

1. Quels sont les impacts de l'AU sur la santé et ses déterminants ? Et comment ces impacts différent-ils selon le contexte socioéconomique du pays ou les caractéristiques sociodémographiques (sexe, catégorie d'âge) de des individus ?

¹ Selon Bourdieu (1980) le capital social se définit comme étant l'ensemble des ressources actuelles ou potentielles liées à la possession d'un réseau durable de relations personnelles ou institutionnelles / appartenance à un groupe.

2. Quelles sont les caractéristiques et motivations des pratiquants de l'AU dans les quartiers défavorisés des grandes villes? Et comment ces motivations diffèrent-elles selon leurs contextes socioéconomiques ?

3. Comment les programmes d'AU dans les quartiers défavorisés permettent-ils d'observer la mise en œuvre des principes de transformation de l'espace? Et comment ces programmes créent-ils des expériences significatives pour leurs participants?

Objectifs de la thèse

Cette thèse de doctorat s'intéresse aux motivations individuelles dans la pratique de l'AU dans les quartiers moins favorisés de trois villes présentant des contextes socioéconomiques différents. Nous répondrons aux questions de recherche susmentionnées en organisant notre travail autour de quatre objectifs spécifiques, présentés dans quatre articles scientifiques théoriquement et méthodologiquement liés, et qui permettent d'éclairer l'essentiel des résultats obtenus.

Objectif 1. Développer une stratégie de recherche documentaire pour caractériser l'ensemble des impacts de l'AU sur les déterminants de la santé.

Objectif 2. Identifier les impacts de l'AU sur la santé et ses déterminants (santé, sécurité alimentaire, capital social) et caractériser les résultats selon le niveau d'influence (individuel, ménage, communautaire) et le niveau de revenus des pays (élevé, moyen et faible).

Objectif 3. Décrire les motivations pour brosser le portrait du profil des individus qui pratiquent l'AU dans des quartiers défavorisés de Montréal (Canada) et de Quito (Équateur).

Objectif 4. Examiner si l'UA qu'on observe dans les quartiers défavorisés de Port-au-Prince (Haïti) répond aux principes de transformation d'espaces détériorés.

Dans son ensemble, la thèse discute des caractéristiques et motivations qui justifient la pertinence de l'AU en regard des enjeux sociaux des quartiers moins favorisés des grandes villes. Elle démontre comment les pratiquants de cette activité sont capables de transformer des espaces détériorés pour projeter une nouvelle image de leurs quartiers.

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Chapitre 1 — Impacts de l'agriculture urbaine sur des déterminants de la santé : Protocole d'une revue systématique de type *scoping review*

1.1 Résumé

L'objectif du protocole présenté dans ce chapitre était de développer une stratégie de recherche pour une revue systématique de type *scoping review* caractérisant les études empiriques portant sur les effets bénéfiques et négatifs de l'AU sur la santé et ses déterminants. Dans ce chapitre, on présente les détails de ce protocole pour expliquer la stratégie de recherche développée avec l'aide d'un bibliothécaire spécialiste en recherche documentaire. Une stratégie de recherche a été élaborée, autour des mots clés liés à l'AU et à différents déterminants de la santé. On a ensuite sélectionné sept (7) bases de données bibliographiques électroniques: PubMed, Embase, MEDLINE (Embase), CINAHL Plus, Academic Search Premier (EBSCO), CAB Abstract (Ovid) et Web of Science. Ce choix de plusieurs bases se fonde sur la possibilité d'obtenir une grande variété d'études scientifiques publiées dans des disciplines diversifiées telles que l'agriculture, la santé et l'aménagement du territoire. L'article sur le protocole expose comment les mots clés devaient être combinés avec les syntaxes booléennes (Et/OU) appropriées pour rechercher les études dans les bases de données bibliographiques. Ensuite, il décrit les étapes du processus de sélection, d'extraction des données et de présentation des résultats des études à inclure dans la revue systématique. Le protocole a été soumis et publié dans une revue avec un comité de lecture en raison de la complexité du sujet, et pour assurer la rigueur scientifique de la revue systématique.

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Impacts of Urban Agriculture on the Determinants of Health: Scoping Review Protocol

Pierre Paul Audate¹, MSc; Melissa A Fernandez^{2,3}, MSc RD; Geneviève Cloutier¹, PhD; Alexandre Lebel^{1,4}, PhD

¹Graduate School of Land Management and Urban Planning, Laval University, Québec, QC, Canada

²Institute of Nutrition and Functional Foods, Laval University, Québec, QC, Canada

³School of Nutrition, Laval University, Québec, QC, Canada

⁴Evaluation Platform on Obesity Prevention, Quebec Heart and Lung Institute, Québec, QC, Canada

Corresponding Author:

Pierre Paul Audate, MSc

Graduate School of Land Management and Urban Planning

Laval University

Pavillon Félix-Antoine-Savard, bureau FAS-1616

2325, allée des Bibliothèques Université Laval

Québec, QC,

1.2 Abstract

Background: Since the 1990s, urban agriculture (UA) has contributed to improving food security in low- and middle- income countries. Now, it is implemented as a multifunctional intervention that can influence various determinants of health (eg, food security, social relationships). Studies of interest stem from several research disciplines, use a wide range of methods, and show results that are sometimes inconsistent. Current studies have not summarized the overall effects of UA on health and its determinants.

Objective: The objective of this protocol is to develop a research strategy for a scoping review that characterizes studies of beneficial and adverse impacts of UA on health and its determinants in a wide range of disciplines.

Methods: Initially, with the help of a library specialist, a list of publications will be obtained through a systematic search of seven electronic bibliographic databases: PubMed, Embase, MEDLINE (Embase), CINAHL Plus with full text, Academic Search Premier (EBSCO host), CAB Abstract (Ovid), and Web of Science. Secondly, a three-step screening by two independent reviewers will lead to a list of relevant publications that meet eligibility and inclusion criteria. Finally, data on the bibliography, type of participants, type of study, results of study, and countries will be extracted from included articles and analyzed to be presented in a peer-reviewed article.

Results: The findings are expected to identify research gaps that will inform needs for UA research in specific fields (eg, mental health), among certain population groups (eg, adults) or within different economic contexts (eg, low-, middle-, or high-income countries). Furthermore, the findings are expected to identify knowledge gaps and direct future research needs.

Conclusions: This is an original study that seeks to integrate beneficial and adverse effects of UA on health at different level of influence (individuals, households, and community) to facilitate a better understanding of UA impacts. This protocol is a first of its kind and is expected to lead to a characterization of UA impacts based on sociodemographic profiles of participants and income levels of the studied countries. This will be relevant for policy makers and UA practitioners.

1.3 Introduction

1.3.1 Background

Since the 1990s, urban agriculture (UA) has been a strategy contributing to improving income and food security for individuals and households in low- and middle- income countries, particularly in Africa [1-5]. In cities such as Dar-es-Salaam, Tanzania and Bamako, Mali, UA provides more than 30% of the city's vegetable needs and generates wages equivalent or higher than those of civil servants or unskilled construction workers [5]. In high-income countries, UA has contributed to food security in times of emergency or economic crisis [6-8]. For example, it is documented that countries in North America and Europe have encouraged their citizens to engage in UA activities during the first and second World Wars in response to pressures on the food supply [9, 10]. Beyond its traditional purposes (food security and income improvement), UA is now considered as a multifunctional intervention [11,12]. It is part of health promotion strategies [13,14], urban planning [12], and/or global policies to develop sustainable city food systems [15,16]. It can also play an important role in the availability of green infrastructure and biodiversity in urban environments [17]. Its function in the recycling of urban organic waste is also recognized [18]. In some contexts, it is perceived and practiced by urban dwellers to reduce the ecological footprint of the food industry [12]. It is supported by a range of actors including health professionals [19], government agencies, community groups, and researchers [20]. In general, it can be viewed as small areas used in cities for agricultural production or to raise animals for domestic consumption or local sales [21].

UA as an intervention can have social and economic impacts on individuals, households, and/or an entire community by directly influencing health or its determinants. It can influence food security, mental or physical health, or social relationships at different population levels. A significant number of studies have already attempted to demonstrate the contribution of UA to food security [22,23] by assuming an association between UA and access to food [24] or its association with improved household nutrition through consumption of fresh fruits and vegetables [25]. In addition, engagement in UA may improve physical activity and contribute to well-being and health by reducing stress [26,27]. However, the effects of UA on health and its determinants remain inconsistent. Many of these studies have been criticized for their lack of empirical evidence. For example, among studies that have shown UA contribution to food security at individual or household levels, some are often criticized because of poor data quality or lack of methodological rigor [28, 29].

Other studies have focused on the negative effects of UA. For example, several studies highlight the potential public health risks associated with UA [19] by addressing concerns related to urban soil and water contamination. Some have raised concerns about the presence of heavy metals in UA soils or harvested crops [30-33] that may have implications for food safety. In fact, traces of heavy metals can be found in vegetables and fruit grown in urban areas, representing a health risk for individuals who consume such products [33,34]. On the other hand,

the potential effects of UA products from contaminated soils on humans are unclear. The concentration of heavy metals in soil does not necessarily reflect heavy metal concentrations in harvested crops and the utilization of these crops does not inevitably represent a risk to human health [35,36]. Nevertheless, it is important to note that UA has potential public health risks, which need to be documented.

Although some systematic reviews have been conducted on UA and health, specifically food security and wellbeing [27], there are no reviews that refer to the adverse effects of UA. To our knowledge, most of these types of studies have not considered a holistic approach that includes beneficial and adverse impacts of UA. Three systemic reviews [28,37,38] have examined the contribution of UA to one type of determinant of health in a specific context; food outcomes in low or middle-income countries. Two of them: Warren et al [28] and Poulsen et al [37] recommended new research due to poor quality and heterogeneity of the primary studies included. Although both studies have considered food security as an analytical framework, they only had four included studies in common. Poulsen et al [37] only included studies conducted in Africa, even though “region” was not part of the inclusion criteria. In contrast, Warren et al [28] included studies from other geographic locations. The differences may be due to a lack of consistency in research strategy or differences in their selection criteria. Korth et al [38] targeted studies in countries with similar characteristics, low- and middle-income countries, and failed to identify any studies. This reinforces our argument about a lack of consistency in UA contribution to food security in the systematic review processes. One of the common points between the three reviews was the absence of high-income countries in their analysis.

The consideration of high-income countries in literature reviews of interventions similar to UA is not new. Other systematic studies have already evaluated gardening or school gardening, which to some extent are similar interventions to UA. These studies do not allow to draw conclusions about the impacts of UA on health. For example, Ohly et al [39] used a mixed method approach to measure the impacts of school gardens on health and well-being in high-income countries. However, the assessed studies were qualified as low or moderate quality based on the authors' criteria. While methodological weaknesses were also reported for the included quantitative studies, the qualitative studies were described as ideological aspirations. Nicklett et al [40] used the same concept of gardening to demonstrate its association with physical health in high-income countries. Yet, like Ohly et al [39], the review identified methodological weaknesses in the primary studies included, which limit conclusions on a possible impact of gardening activities on physical health.

Current studies have not been able to draw definite conclusions on the effects of UA on specific determinants of health or health in general. Given that UA is a multidisciplinary topic (eg, nutrition, agriculture, urban planning), it may be better to address it first in a more general systematic process such a scoping review and consider a broader impact outcome like health prior to engaging future systematic reviews.

With this scoping review we seek to identify evidence from peer reviewed literature that demonstrates beneficial and adverse impacts of UA on the determinants of health according to countries' income level as defined by the World Bank [41]. The determinants of health are defined as socioeconomic factors that influence health [42]. We aim to identify knowledge gaps and facilitate a better understanding of the global impact of UA on health and its determinants by considering the following two research questions:

1. What are the impacts of UA on health and its determinants?
2. How do these impacts differ according to countries' income level or sociodemographic characteristics of studied participants?

Conceptually, by answering these questions, we will have a better understanding of how UA as an intervention can affect different health outcomes such as food security, nutrition, social relationships, physical or mental health. Furthermore, we are interested in categorizing these outcomes according to level of influence (individual, household and community) and countries' income level (high, middle and low-income). The findings will allow us to draw a global picture of the potential impacts of UA on health present in the existing literature. Identifying research gaps will also allow researchers and policy makers to make informed decisions about future UA research needs and implications for public policy.

1.3.2 Objective

The specific objectives of this study are:

1. To identify UA impacts on health and its main determinants
2. To characterize the results according to population and country income levels.

1.4 Methods

This scoping review will follow the five steps described by Arksey and O'Malley [43] for similar studies with improvements suggested by Levac et al [44]:

1. Identification of the research question (listed above)
2. Identification of relevant studies
3. Selection of relevant and reliable studies
4. Data extraction from included studies
5. Collating, summarizing, and reporting the findings.

1.4.1 Identification of relevant studies:

This scoping review will use the method suggested by Aromataris and Riitano [45] to construct a strategy that can help us target relevant publications on UA impacts on health and its determinants. First, we will identify keywords that are related to our main research questions. To identify keywords, elements of a modified PICOS

framework (participants, intervention or concept, context, outcomes, study design) [46] will be specified to establish eligibility criteria defined according to the following:

- Types of participants: This study considers all human participant groups (eg, children, youth, and adults) at different level of influence (eg, individual, household, or community) who have been implicated by UA.
- Intervention or concept: For the purpose of this review, UA is defined as food growing initiatives that include the production of edible plants and livestock in urban areas. The review will seek studies that assess UA in all its forms when it is used as an intervention consisting of growing food or raise animals for domestic consumption, local sales, or as a leisure activity.
- Outcomes: The targeted outcomes are a set of determinants of health inspired from Dahlgren and Whitehead [42]. For example, food security, income, social relations, and factors that influence mental or physical health (listed in Table 1-1).
- Context: To be included, studies must have been conducted in urban settings of a high-, middle-, or low-income country according to the World Bank's income-based country classification [41].
- Type of study: Peer reviewed quantitative or qualitative studies demonstrating one or more effects of UA on health or its determinants will be included. Narratives, essays, gray literature and theses will be excluded. Other systematic studies will not be included in the analysis, but the list of their references will be examined to identify relevant studies.

1.4.1.1 Search Strategy

The search strategy has been designed with the help of a library specialist and searches will be performed in the following seven electronic bibliographic databases: PubMed, Embase, MEDLINE (Embase), CINAHL Plus with full text, Academic Search Premier (EBSCO host), CAB Abstract (Ovid), and Web of Science. The outlined keywords in Table 1-1 and their alternative terms will be searched in the index terms, title, and abstract (tiab) of each database. In case a keyword is not found in the index terms, it will be substituted by its alternative term or a synonym in the index search and will be searched in titles and abstracts only. For example, in PubMed, the index is the medical subject heading (MeSH), the word *food security* does not appear as a MeSH, so in the search for MeSH, we will use *food supply* as an alternative, but the keyword *food security* will also be searched as it is written in the titles and abstracts. Boolean operators *OR* will also be used to combine individual keywords while the Boolean operator *AND* will be used to combine sets of keywords (eg, the words urban agriculture/urban farm or city agriculture/city farm, are searched as following: (urban *OR* city) *AND* (agriculture *OR* farm). An example of the complete search strategy used on PubMed is described in Table 1-1. This strategy will then be adapted to the other databases using the according syntax and proximity operators.

Table 1-1. Example of search strategy used on PubMed and adapted to other bibliographic databases.

Number	Keywords	Index terms or search-field descriptors
Outcome measures		
1	Food supply	Mesh
2	Food security	Tiab
3	Food insecurity	Tiab
4	Food access	Tiab
5	Food availability	Tiab
6	Food quality	Mesh:NoExp, tiab
7	Food safety	Mesh:NoExp, tiab
8	Food contamination	Mesh:NoExp, tiab
9	Food	Mesh:NoExp
10	Health* food	Tiab
11	Income	Mesh:NoExp, tiab
12	Cost savings	Mesh:NoExp, tiab
13	Poverty alleviation	Tiab
14	Nutritional status	Mesh:NoExp, tiab
15	Nutrient deficiency	Tiab
16	Fruit and vegetable intake	Tiab
17	Fruit and vegetable consumption	Tiab
18	Fruits and vegetables	Tiab
19	Vegetables	Mesh:NoExp
20	Fruit	Mesh:NoExp
21	Fruit? Intake	Tiab
22	Vegetable? Intake	Tiab
23	Diet	Mesh:NoExp, tiab
24	Dietary diversity	Tiab
25	Malnutrition	Mesh:NoExp, tiab
26	Undernutrition	Tiab
27	Overweight	Mesh:NoExp, tiab
28	Obesity	Mesh:NoExp, tiab
29	Quality of life	Mesh:NoExp, tiab
30	Healthy lifestyle	Mesh:NoExp, tiab
31	Exercise	Mesh:NoExp
32	Physical activity	Tiab
33	Leisure activity	Mesh:NoExp
34	Leisure	Tiab
35	Well-being	Tiab
36	Interpersonal relations	Mesh:NoExp, tiab
37	Social capital	Tiab

38	Personal development	Tiab
39	Empowerment	Tiab
40	Education	Mesh:NoExp
41	Nutrition education	Tiab
42	Civic engagement	Tiab
43	Community engagement	Tiab
44	Horticultural therapy	Mesh
45	Therapeutic garden	Tiab
46	Mental health	Mesh:NoExp, tiab
47	Dementia	Mesh:NoExp, tiab
48	Stress psychological	Mesh:NoExp
49	Stress	Tiab
50	Perceptions of life	Tiab
51	Cultural connection	Tiab
52	Violence	Mesh:NoExp
53	Depression	Mesh:NoExp
54	Security perception	Tiab
55	Health risk	Tiab
56	Resilience	Tiab
57	Pain	Mesh:NoExp, tiab
Intervention/Concept		
58	Agriculture	Mesh:NoExp, tiab
59	Food production	Tiab
60	Gardening	[Mesh]
61	Community garden*	Tiab
62	Farm*	Mesh, tiab
63	Allotment\$	Tiab
64	Horticultur*	Tiab
65	Rooftop\$	Tiab
66	Home garden*	Tiab
67	School garden*	Tiab
Context		
68	Cities	Mesh:NoExp
69	City	Tiab
70	Urban	Tiab
71	Metropol*	Tiab
72	Suburban	Tiab
73	Town	Tiab

1.4.2 Selection of relevant and reliable studies:

Due to a limited accessibility of UA scientific papers prior the 1980s, the search will be restricted to articles published between 1980 and 2017. Titles in languages other than English, French and Spanish will be excluded in the selection phase. All identified publications will be transferred to EndNote (X8, Thomson Reuters) and articles whose publication dates and languages do not meet our requirements will be removed. All remaining publications will be transferred to an online systematic review software (DistillerSR, Evidence Partners, Ottawa, Canada), to remove duplicates and for title and abstract screening by two independent reviewers. The full text of eligible articles will be screened by two independent reviewers according to the following inclusion criteria:

- Relevance: The study must be relevant to the question and objectives of our research. It will be considered relevant if it demonstrates one or more beneficial or adverse impacts of UA on human health or its determinants.
- Study design: To be included into the scoping review, the study must also present data collected from human participants. Furthermore, the design of the study must be appropriate to answer the studied research questions. Studies that report environmental impacts will be considered only if they report effects on humans (eg, study on soil contamination will not be included unless it reports the effects of soil contamination on human health).

A list of all excluded articles at this stage will be provided with the reasons for exclusion. The reference lists of included studies will also be reviewed to identify relevant studies. The identified studies will be assessed with the same eligibility criteria to validate their inclusion or exclusion. Final inclusion of the publications will be discussed by the two reviewers and any disagreement on the inclusion or exclusion will be resolved by consensus.

1.4.3 Study quality assessment:

The quality of the included studies will be evaluated using the criteria of the Effective Public Health Practice Project (EPHPP)² guide for quantitative studies, and the qualitative study evaluation criteria of Wallace et al [47] used by Ohly et al [39] for the assessment of the quality of qualitative studies. The evaluation of the quality of the studies, in both cases, will consider the risks of bias in the methodologies of the studies. Thus, any evaluated study with a high risk of bias will be reported in the results section.

² EPHPP, Quality assessment tool available online on <https://www.ephpp.ca/quality-assessment-tool-for-quantitative-studies/>

1.4.4 Collating, summarizing, and reporting the results:

Data as described in Textbox 1-1 will be extracted from the included articles and the results will be presented in a way to identify the main areas of interest and gaps in the literature on UA impacts.

Textbox 1-1. Data extraction for analysis (type of data and variables)

<p>Reference</p> <ul style="list-style-type: none">• Author• Year <p>Study location</p> <ul style="list-style-type: none">• City, country• Country income level <p>Population</p> <ul style="list-style-type: none">• Type of participants (individual, household, community)• Characteristics of participants (age; sex; children, youth, adults) <p>Type of study</p> <ul style="list-style-type: none">• Study purpose• Study design• Outcomes measured <p>Results</p> <ul style="list-style-type: none">• Type of impacts (beneficial, adverse)• Results of study
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Once this information is extracted, the results will then be presented in two forms to make a narrative account of the literature [43]. As a first step, a numerical analysis will be presented in the form of a diagram [48] that will highlight the measured outcomes—determinants of health according to number, the nature, and the geographical distribution of the included studies. In a second step, the studies will be grouped according to the category and characteristics of studied participants (individuals, households, and communities; age and sex) to make comparisons, identify contradictions in evidence, methodology, and find research gaps.

1.5 Results

The findings are expected to identify research gaps that will inform needs for UA research in specific fields (eg, mental health), among certain population groups (eg, adults) or within different economic contexts (eg, low-,

middle- or high-income countries). Furthermore, the findings are expected to identify knowledge gaps and direct future research needs.

1.6 Discussion

To our knowledge, this scoping study is the first of its kind to explore both beneficial and adverse impacts of UA on health determinants. Other systematic studies have already provided valuable information on specific benefits of UA. However, in the current context of urbanization and climate change where health and environmental challenges are related to food production in cities, it is obvious that the adverse impacts of UA are a concern [49]. Therefore, the identification of evidence that only includes beneficial impacts of UA, does not allow an objective analysis to draw conclusions on its impacts. With our findings, we hope to bring a set of elements that allow a better understanding when defining the advantages and disadvantages of the UA as an intervention.

This study will highlight the state of research on the association between UA and health. A holistic approach that considers beneficial and adverse effects of UA, may inform public policies and target intervention populations. The scoping review will allow for a better understanding of the contributions or consequences of UA on specific determinants of health. It may also be used by policy makers to target indicators that can help better evaluate UA as an intervention that directly impacts individuals, households, or communities. Such approach will also serve to inform urban planning decisions where the role of agricultural production has not always been evident [50].

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1.8 Authors' Contributions

PPA and AL conceptualized the scoping review protocol. PPA developed search strategy with guidance from the library specialist and inputs from the entire team (PPA, MAF, GC, AL). PPA and MAF wrote the manuscript of the scoping review protocol with critical inputs and appraisal from GC and AL. All authors have read and approved the manuscript.

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Chapitre 2 — Revue systématique des impacts de l'AU sur les déterminants de la santé

2.1 Résumé

Cette revue systématique de type « *scoping review* » a été réalisée dans le but d'explorer les données empiriques des impacts bénéfiques et négatifs de l'AU sur les déterminants de la santé. La démarche visait, du même coup, à identifier des lacunes pour des recherches futures dans le domaine de l'AU. Comme indiqué dans le chapitre précédent, une recherche systématique a été réalisée dans sept (7) bases de données bibliographiques électroniques : PubMed, Embase, MEDLINE (Embase), CINAHL Plus, Academic Search Premier (EBSCO), CAB Abstract (Ovid) et Web of Science pour identifier des études empiriques publiées sur les impacts de l'AU sur des déterminants de la santé. La stratégie de recherche a permis de recenser un ensemble d'articles scientifiques publiés entre janvier 1980 et décembre 2017 dans chacune des bases de données. Les études recensées ont été sélectionnées en utilisant des critères tels que : le type de participants de l'étude, le type d'intervention ou de formes d'AU, le contexte (urbain, péri-urbain), les indicateurs ou déterminants de la santé évalués et le type d'étude faisant l'objet de l'article. Ensuite, des données ont été extraites des études retenues pour faire une synthèse de leurs résultats. Un ensemble d'outils disponibles dans la littérature a ensuite été utilisés pour élaborer deux grilles d'évaluation de la qualité des études incluses.

Au total 8710 articles ont été recensés dans les bases de données et par quelques recherches manuelles additionnelles. De ce total, 101 études (51 quantitatives, 29 qualitatives et 21 méthodes mixtes) ont été retenues pour être incluses dans le *scoping review*. Parmi ces études, 38% ont rapporté des résultats provenant d'Amérique du Nord et 37% provenant de l'Afrique subsaharienne. Par ailleurs, très peu d'études menées dans des régions comme l'Amérique Latine ont été recensées, alors que l'AU y est largement pratiquée et que s'y trouvent des cas emblématiques, reconnus dans la littérature grise. Les études quantitatives ont révélé des preuves substantielles d'impacts positifs de l'AU sur des indicateurs de sécurité alimentaire et de nutrition, de santé physique et mentale et du capital social. Les études qualitatives, de leur côté, ont rapporté un ensemble de bénéfices et de motivations perçus dans la pratique de l'AU. Les bénéfices les plus fréquemment mentionnés sont le renforcement du capital social, la sécurité alimentaire, l'amélioration de la santé et / ou du bien-être. Néanmoins, la présente revue systématique invite à la prudence dans l'interprétation de ces données puisque la qualité de la plupart des études a été jugée de faible à modérée. Par ailleurs, aucune conclusion définitive n'a été tirée quant aux impacts négatifs de l'AU sur la santé et ses déterminants. La revue invite plutôt à accorder une attention particulière aux travaux traitant de la contamination des sols et des produits de l'AU.

Enfin, l'inconstance et la faible qualité dans la méthodologie des études analysées ont révélé la nécessité de recherches plus rigoureuses dans le domaine de l'AU pour mieux démontrer les impacts positifs et négatifs de cette activité sur la santé et ses déterminants. On recommande aussi, à la suite de cette revue systématique, d'adopter une approche holistique ou transnationale dans les recherches futures pour mieux contraster les réalités de la pratique de l'AU dans différents contextes socioéconomiques.

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Scoping review of the impacts of urban agriculture on the determinants of health

Pierre Paul Audate^{1,2*}, Melissa A. Fernandez^{3,4}, Geneviève Cloutier^{1,2} and Alexandre Lebel^{1,2,5}

1Graduate School of Land Management and Regional Planning, Faculty of Planning, Architecture, Art and Design, Laval University, Quebec G1V 0A6, Canada.

2Centre for Research on Planning and Development (CRAD), Laval University, Quebec G1V 0A6, Canada.

3Institute of Nutrition and Functional Foods, Laval University, Quebec G1V 0A6, Canada.

4School of Nutrition, Faculty of Agricultural and Food Sciences, Laval University, Quebec G1V 0A6, Canada.

5Evaluation Platform on Obesity Prevention, Quebec Heart and Lung Institute, Quebec G1V 4G5, Canada.

*Corresponding Author:

Pierre Paul Audate, MSc

Graduate School of Land Management and Urban Planning

Laval University

Pavillon Félix-Antoine-Savard, bureau FAS-1616

2325, allée des Bibliothèques Université Laval

Québec, QC,

2.2 Abstract

Background: There has been an increasing interest in urban agriculture (UA) practice and research in recent years. Scholars have already reported numerous beneficial and potential adverse impacts of UA on health-related outcomes. This scoping review aims to explore these impacts and identify knowledge gaps for future UA studies.

Methods: A systematic search was conducted in seven electronic bibliographic databases to identify relevant peer-reviewed studies. Articles were screened and assessed for eligibility. From eligible studies, data were extracted to summarize, collate, appraise the quality and make a narrative account of the findings.

Results: A total of 101 articles (51 quantitative, 29 qualitative, and 21 mixed methods studies) were included in our final analysis. Among these articles, 38 and 37% reported findings from North America and Sub-Saharan Africa respectively. Quantitative studies revealed evidence of positive impacts of UA on food security, nutrition outcomes, physical and mental health outcomes, and social capital. The qualitative studies reported a wide range of perceived benefits and motivations of UA. The most frequently reported benefits include contributions to social capital, food security, health and/or wellbeing. However, the evidence must be interpreted with caution since the quality of most of the studies was assessed as weak to moderate. While no definitive conclusions can be drawn about the adverse impacts of UA on health, paying particular attention to contamination of UA soil is recommended.

Conclusion: More peer-reviewed studies are needed in areas where UA is practiced such as Latin America and Caribbean. The inconsistency and the lack of strong quality in the methodology of the included studies are proof that more rigorous studies are also needed in future research. Nevertheless, the substantial existing evidence from this review corroborate that UA can influence different determinants of health such as food security, social capital, health and well-being in a variety of contexts.

2.3 Background

Until recently, food systems were given little attention in the agenda of urban planners [1]. Urban agriculture (UA) is an example of food system components with little or no existing regulations in many cities worldwide. In the last decades, practitioners have been advocating for the inclusion of UA in urban planning policies [2]. This has opened new avenues for research on UA in a wide range of disciplines.

Numerous beneficial and potential adverse impacts of UA have been reported in urban planning and public health fields [3, 4]. Studies on urban gardens in high-, middle-, and low-income countries suggest they influence several food security and nutrition outcomes [5, 6]. For example, in the United States (US), participation in community gardening (a type of UA intervention when it is practised in urban settings) increased fruit and vegetable (F&V) consumption of gardeners in comparison to their non-gardening counterparts [7, 8]. Greater F&V consumption is associated with health improvements and prevention of chronic diseases [9]. UA related activities have also demonstrated an influence on physical and mental health outcomes.

A study conducted in two large community garden networks in Salt Lake City, Utah has demonstrated that UA is a good physical activity that can prevent obesity. This study revealed that the community gardener participants had significantly lower body mass index (BMI) compared with their neighbors who did not participate in community gardening activities [10]. The positive role of urban gardening in human well-being has also been explored [11]. Additionally, urban gardening has been proven to positively influence stress reduction outcomes [12], foster social cohesion while providing participants the opportunity to build social networks and connect to their community [13].

Despite these potential positive effects on a variety of health determinants, researchers are demanding for further clarity on the benefits of UA [14]. Adverse impacts of UA have also been reported by the public health community and urban planners. Several studies showed UA practices can influence food safety because of the risks associated to urban soil or water contamination [15, 16]. Other studies have pointed out the facts that urban gardening can be a place where certain participants feel excluded, or it can also be a place where existing race and social class-based disparities are replicated [17]. All these assumptions and evidence make the literature on UA impacts on health outcomes very diverse.

The diversity of evidence in the literature could be explained by different methodological approaches, a focus on a specific aspect of UA, or the socioeconomic context where UA is implemented. This scattered knowledge makes it difficult to help urban planning stakeholders and could possibly misguide decision making; and would benefit from a synthesis of scientific knowledge on this matter.

To our knowledge, there is only a limited number of systematic reviews on this topic [18–21]. While three literature reviews [18, 19, 21] have focused on the beneficial impacts of UA on specific food security or nutrition

outcomes such as dietary intake, nutritional status, or healthy food access, they have not considered potential adverse impacts. Guitart et al. [20], has taken a broader approach to synthesize the existing knowledge by also including the adverse impacts. However, this review only considered urban community gardening which is a specific type of UA that does not include other types such as backyards, domestic gardening, or individual owned farms.

Furthermore, beyond how UA was defined by authors, reviews showed a lack of diversity in the socioeconomic context and geographic scope in included primary studies. While Poulsen et al. [19] and Warren et al. [18] mainly included studies from low- and middle-income countries from Sub-Saharan Africa, most of the primary studies included by Guitart et al. [20] were from the US, a high-income country. Only one primary study [22] from Sub-Saharan Africa's region was included into the final analysis of Guitart et al. [20]'s study. While Poulsen et al. [19] only explored low-income countries, in Warren et al. [18], socioeconomic contexts were not an exclusion criterion. Three primary studies from high-income countries identified [7, 8, 23] were purposely excluded from Warren et al. [18] final analysis because the number was considered too low in terms of studies to include.

Based on these observations, there is still a need for systematic reviews that explore the impacts of UA in a broad socioeconomic context and geographic scope. By synthesizing vast amounts of literature, a systematic review can provide insights into understanding the general or common characteristics of individuals and communities involved in UA and how this activity affects their health.

For this paper, the determinants of health are personal, socioeconomic, environmental, and cultural factors that influence a person's or community's health. They include lifestyle, food, social and community networks, sanitation, environment etc. [24].

The aim of this study was to explore the impacts of UA on the determinants of health and identify knowledge gaps for future UA studies by conducting a scoping review of peer-reviewed literature. The following research questions were investigated: i) what are the impacts of UA on the determinants of health? and ii) how do these impacts differ according to countries' income level (high-, middle-, and low-income) and sociodemographic characteristics of participants? The responses to these questions will allow us to present the geographical location of UA studies, the type of impacts (positive or adverse) studied, and the methods utilized by scholars to assess the impacts of UA on the determinants of health.

2.4 Methods

A systematic literature review on the impacts of UA on health determinants was performed. The wide range of health determinants, methods and results used in UA research suggests the use of a scoping review as described by Arksey and O'Malley [25] and Levac et al. [26]. A scoping study adopts a broader search strategy

while allowing reproducibility, transparency, and reliability on the current state of literature. The detailed protocol of this scoping study that includes the search strategy and steps of the systematic review process has been published elsewhere [27]. Briefly, the search strategy included a set of keywords on UA, and determinants of health identified with the help of a library specialist for electronic bibliographic search. An additional file shows the keywords in detail (see Annex A, Additional file 1).

2.4.1 Identification of relevant studies

Original peer-reviewed articles published in English language journals from January 1980 to December 2017 were obtained from systematic searches of seven electronic bibliographic databases that include: PubMed, Embase, MEDLINE (Embase), CINAHL Plus with full text, Academic search premier (EBSCO host), CAB Abstract (ovid), and Web of science in January 2018. The final search strategy for PubMed can be found in an additional file (see Annex A, Additional file 1). All identified articles from the searches were transferred to a reference manager software (EndNote, X8 Thomson Reuters) and all duplicates and titles in other languages were removed. The EndNote (X8 Thomson Reuters) file was later transferred to an online systematic review software (Distiller SR, Evidence Partners, Ottawa, Canada) for screenings. The PICOS (participants, intervention, context, outcomes, and study design) framework [28] was used to establish eligibility criteria. To be included, original peer-reviewed articles had to meet five criteria. First, the study considered UA as a food growing initiative that involves participants. Soil and water contamination studies that did not specifically assess risks for humans were excluded. Second, the focus of the study was UA defined as a food growing initiative in urban settings. Studies that combined other interventions with food production (e.g. school gardening programs that include cooking lessons [29–31]) were excluded due to our inability to ascertain the independent effect of UA on the targeted health outcome. Third, the study was conducted in urban areas. All studies that explicitly stated they consider rural, peri-urban, or suburban areas were excluded unless the results were desegregated to make comparisons with urban areas. Fourth, at least one of the outcomes measured or findings reported in the study were determinants of health as listed in Table 2-2. Fifth, only peer-reviewed articles written in English that describe original quantitative, qualitative, or mixed methods research were considered. Grey literature, narratives, commentaries, or other document types such as reports, and essays were excluded. Systematic reviews were also excluded; however, the reference lists of all eligible ones were carefully revised for additional relevant studies.

2.4.2 Selection of relevant and reliable studies

By applying the eligibility criteria, two reviewers (PPA with background in agriculture and MAF with background in nutrition) have screened the articles for selection. The first selection was from title and abstract screening and the second one was from a full-text screening. All conflicts generated through the screening stages between the

two reviewers were discussed until consensus was reached. When needed, a third opinion from two other authors (AL and GC) was consulted to reach consensus.

2.4.3 Data extraction from included studies

Once the articles were selected, the following data were recorded in a spreadsheet: author(s), year, city, region, country's income level, level of influence (e.g. individual, household or community), characteristic of participants (e.g. children, adults), type of UA (e.g. community gardening, home gardening, allotment, school gardening, and urban farming), study purpose, study design (e.g. quantitative, qualitative, or mixed methods), measurement methods, outcomes measured, and key findings (see Annex A, Additional file 4). One author extracted the data, and another validated them to ensure accuracy prior the quality appraisal phase.

2.4.4 Study quality appraisal

For the quality appraisal of the included articles a checklist (see Additional files 2 and 3) was developed using Wallace et al. [127] criteria and a modified rating system as suggested by Ohly et al. [128] for the qualitative studies. Given the mix of study methods found in the quantitative studies (cross-sectional, randomized controlled trials, before and after surveys, risk assessment), it was not appropriate to consider only one existing quality assessment tool to appraise the quality of quantitative studies. The authors have instead opted to develop a 12-item checklist based on criteria and questions from the following three quality assessment tools sources: i) assessment tool for observational cohort and cross-sectional studies, and assessment tool for before-after studies with no control groups [129], ii) quality assessment tool for quantitative studies from the Effective Public Health Practice Project (EPHPP)³, and iii) study limitations and ethical criteria [127]. We used the same overall rating system for quantitative and qualitative studies. The first author (PPA) appraised the quality of the included studies and obtained validation from the second author (MAF). When needed, a third opinion from the other two authors (AL and GC) was consulted.

2.4.5 Collating, summarizing, and reporting the findings

A narrative account of the included studies was prepared to present patterns in UA impacts on the determinants of health. A numerical analysis presented the number, geographical distribution, and type of UA of the included studies. Since the outcomes were broad, they were synthesized thematically to record the overall impacts of UA as positive, adverse, neutral, or mixed for the quantitative or mixed methods studies in some cases. The neutral impact was assigned to studies that presented quantitative measurement tools but did not present significant results as positive or adverse effect of the measured outcomes in their findings. The mixed impact was used to classify studies that presented both positive and adverse effects of the measured outcomes. On the other hand,

³ EPHPP, Quality assessment tool available online on <https://www.ephpp.ca/quality-assessment-tool-for-quantitative-studies/>

the terms perceived benefits, challenges or motivations were used to classify the outcomes of the qualitative and the remaining mixed methods studies. The reported outcomes and findings were synthesized and grouped into specific themes defined by the authors to alleviate the narrative account (Table 2-2).

2.5 Results

2.5.1 Identification of potential studies

The searches from the seven electronic databases hit a total of 8697 records (Pubmed: 674, Embase: 791, Medline: 637, CINAHL Fulltext: 295, Academic search premier: 692, CAB abstract: 2506, Web of science: 3102) that led to a total of 6683 titles and abstracts that were screened after the removal of duplicates. We retrieved a total of 418 full-text articles from our different libraries. Six records were unable to be obtained in full-text format. The full-text screening's stage led to 118 potential articles relevant to our scoping review. Additional articles were excluded after full-text assessment for the reasons mentioned in the flowchart (Fig. 2-1). A total of 101 articles were therefore included in our final data extraction, quality appraisal, and narrative account stages.

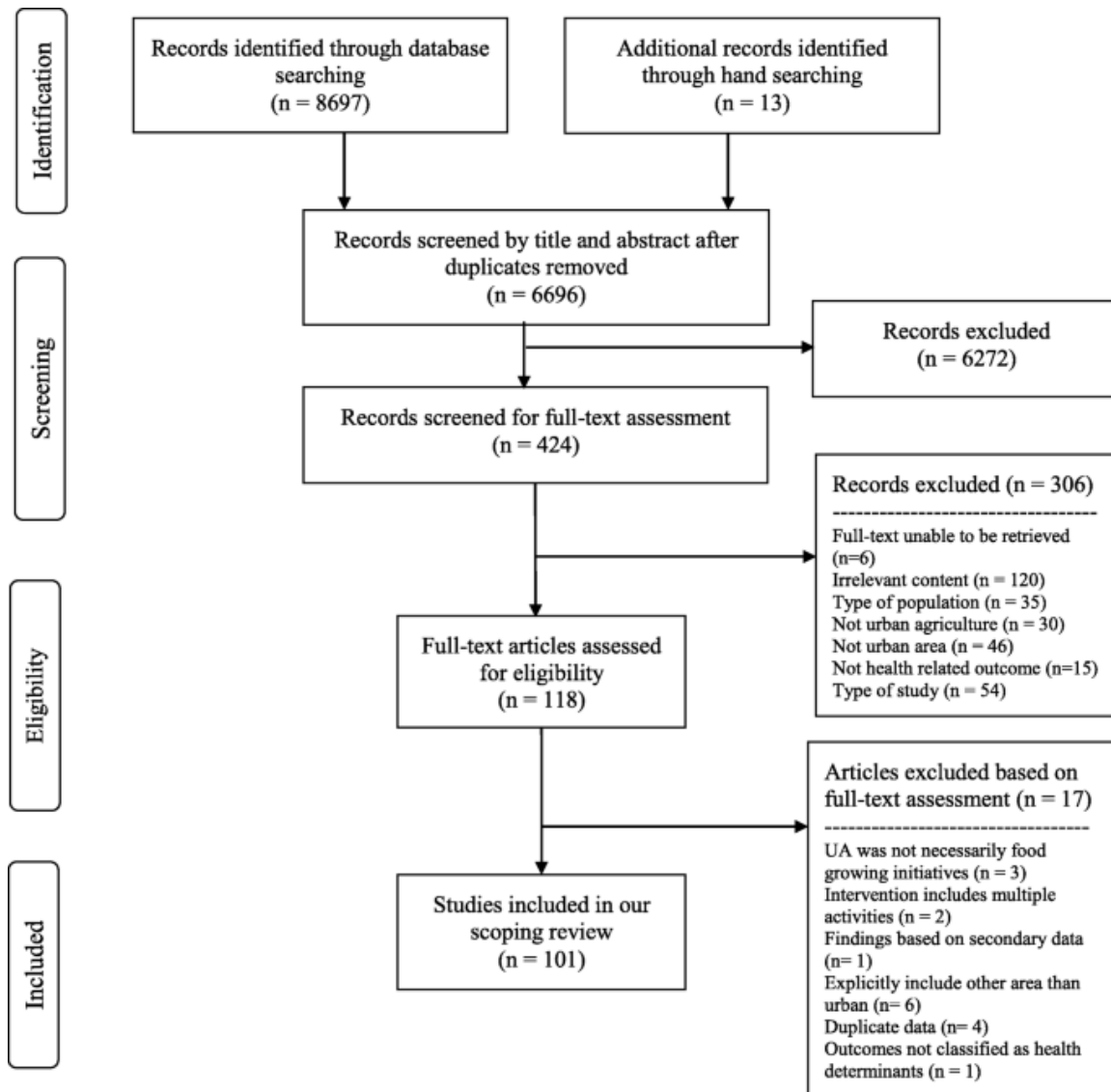


Figure 2-1 Flow chart of the studies identification and selection process

2.5.2 Characteristics of the included studies

The peer-reviewed literature on the impacts of UA on the determinants of health is recent and it has considerably increased in the last few years (Table 2-1). Among the included studies, 61% were published in the last five years of this current study (2013–2017) and approximately, 90% have been published in the last decade (2007–2017) of this current study.

Table 2-1 Number of included articles by decade (1980–2017)

Year	Number of studies
1980–1990	0
1991–2000	2
2001–2010	19
2011–2017	80
Total	101

In terms of geographic scope of the included studies, they are mainly from two world regions where 38 and 37% were conducted and reported findings from North America and Sub-Saharan Africa respectively (Fig. 2-2). Research in North America was predominantly from the US which alone has 33 of the 101 included studies. In the case of Sub-Saharan Africa’s region, the studies are divided among several countries. For example, the country with the highest number of included studies in this region is Nigeria with a total of nine studies. In addition, at least 12 other countries from this region are represented in our list of included studies.

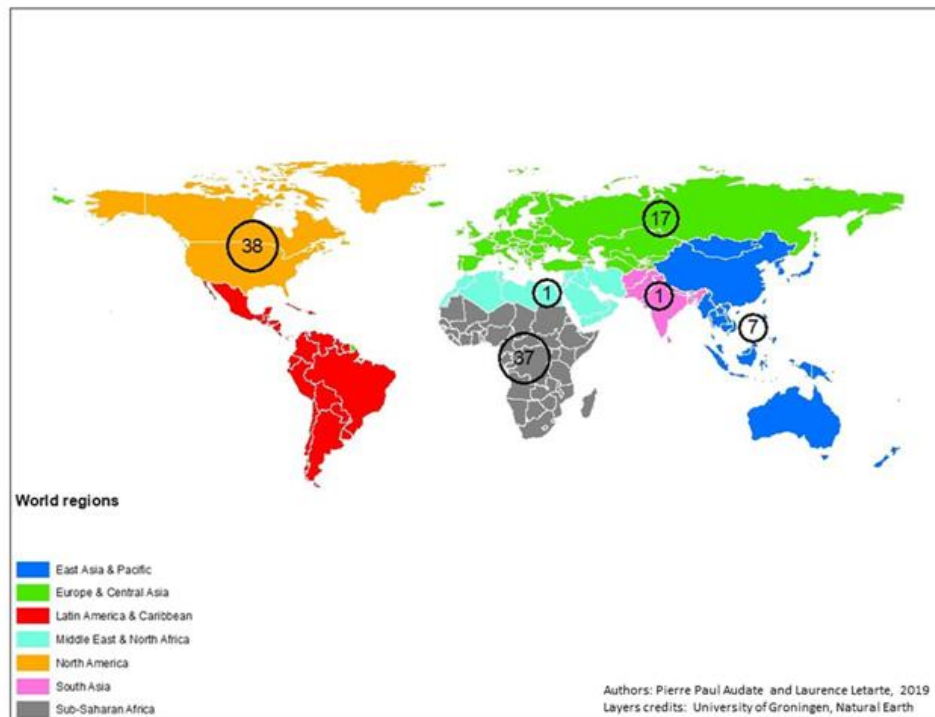


Figure 2-2 Number of included studies by world regions

Out of the 101 included studies, 59% were focused on high- income countries, 32% in middle- income, 8% in low- income and 1% in both (middle- and low- income) countries. In addition, there is a diversity of countries n = 34 in total where the impacts of UA on health-related outcomes have been studied.

2.5.3 Type of methods and design

The included studies in our research have used three types of study design: n = 51 used quantitative methods, n = 29 used qualitative methods, and n = 21 have explored mixed methods (Table 2-2). Among the quantitative studies n = 14 are health assessments, n = 25 used cross-sectional surveys, n = 2 used both health assessment and cross-sectional surveys, n = 4 quasi-experimental designs, n = 1 randomized control trial, n = 1 before and after or pre- and post-surveys, and n = 4 case studies. The qualitative and mixed methods used a wide range of measurement methods to collect data such as in-depth and semi-structured interviews, focus groups, surveys, and observation questionnaires (see Annex A, Additional file 4). They have also used a wide variety of qualitative approaches that include ethnography, grounded theory, and case studies. However, in most of the cases, it was difficult to identify the qualitative approaches because the authors did not provide enough details on their methodology.

2.5.4 Quality appraisal of the included studies

All types of included studies were assessed for the quality of the outcomes and findings reported. Those which quality was appraised as strong are identified in Table 2-2. The quality of quantitative and qualitative aspects of mixed-methods studies, was appraised separately (see Annex A, Additional files 2 and 3). Overall, most studies reporting quantitative data were appraised with weak or moderate quality ratings. Only four quantitative studies were rated as strong. Most of the studies that scored weak or moderate did not provide enough information and details to justify their population size and used cross-sectional study designs without repeated measurements or control groups. More than half of them did not address limitations and ethical issues related to their study design. Similarly, more than 90% of the studies that reported qualitative data were also rated as weak or moderate. Only, seven qualitative studies were rated as strong studies. The majority scored moderate or weak because they did not provide enough information on their data collection, theoretical approach, methods, and did not address limitations or ethical issues (see Annex A, Additional file 3).

2.5.5 Type of UA studied

The included articles used a variety of terminology to study UA. Among the most commonly type of terminology used: n = 36 partly or entirely explored community gardening, n = 19 studied urban or commercial farming, n = 9 explored home or backyard gardening, n = 7 used the term allotment gardening, n = 7 were focused on institutional type of UA such as school gardening, church gardening, or gardening on university campuses.

Urban livestock, urban rooftop farming, sack gardening, are also among other terms used to identify UA activities (see Annex A, Additional file 4).

2.5.6 Type of health-related outcomes assessed

The quantitative outcomes assessed and qualitative themes that emerged were grouped into ten categories inspired from the determinants of health model [24] (Table 2-2). Most studies investigated multiple determinants of health such as food security, nutrition, social capital. Among the studies that measured food security outcomes, 7 (5 quantitative, 1 qualitative, and 1 mixed methods study) reported findings only on food security outcomes. Among the ones focused on nutrition, there are three quantitative studies that assess only nutrition outcomes (see Annex A, Additional file 4).

Tableau 2-2 Characteristics of health-related outcomes assessed by the included studies

Reference and study design						
Determinants of health	N	Quantitative	Qualitative			Mixed methods
			Perceived benefits	Perceived challenges	UA Motivations	
Food security	4 7	[7, 32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50]	[51,52,53,53], [54] ^a , [55,56,57,57], [58,59,60] ^b , [61, 62]		[54] ^a , [63]	[64,65,66,67,68,69,70,71,72,73,74,75,76,77]
Social and community networks (social capital)	3 6	[33, 45, 48, 78], [79] ^b , [80,81,82]	[52, 55], [58] ^b , [59] ^{a,b} , [60] ^b , [61, 62], [83], [84] ^b , [85,86,87,88,89,90,91], [92, 93] ^b	[51, 56] [59] ^{a, b}	[63]	[66, 68, 73, 75, 94,95,96]
Health and/or well-being	2 4	[10, 33, 43, 45, 78, 82], [97, 98] ^b	[5, 51, 55, 89, 90], [92] ^b , [99], [100] ^b , [101], [102] ^a		[102] ^a	[67, 68, 73, 74, 94, 103]
Sanitation and/or food safety	2 4	[15, 16, 37, 104,105,106,107,108,109,110,111,112,113,114,115,116,117,118,119]		[5, 55]		[77, 120, 121]
Income, cost savings and/or employment	2 3	[32, 34, 36, 41,42,43, 45, 47, 122]	[56, 57], [58] ^b , [83], [100] ^b		[101]	[66, 67, 69, 71,72,73, 76, 95]
Nutrition	1 7	[7, 8, 33, 40, 44, 47,48,49, 80], [123] ^b , [124]	[5], [92] ^b , [101]			[70, 103, 125]
Natural and/or physical environments	9	[80, 126]	[83], [84] ^b , [102]	[5], [57], [92] ^b		[72]
Cultural connection	8		[52, 53, 61, 86, 88]		[63, 91]	[77]
Lifestyle	6	[37, 78], [98] ^b	[84] ^b		[91]	[65]
Education and/or empowerment	5	[44]	[60] ^b , [90]			[103, 125]

1. ^aFindings were discussed in more than one category
2. ^bStudy quality was rated as strong

2.5.7 Quantitative studies

2.5.7.1 *Food security and nutrition outcomes*

Among the studies that investigated food security outcomes 75% reported findings that demonstrated the positive impacts of UA on food security. Two studies [42, 43] reported findings that influenced participants both positively and negatively. Three studies [36, 39, 47] were neutral because they did not provide evidence of any impacts on food security.

Eleven quantitative studies investigated nutrition outcomes (Table 2-2). Among them, UA was reported to positively influence F&V intake of participants in five studies [7, 8, 33, 44, 80], nutritional status of children in two studies [49, 124], and food diversity in one study [40]. Two studies [47, 123] did not provide any evidence of impacts of UA activities on nutrition outcomes. For example, Christian et al. [123] used a strong quantitative study design to measure F&V intake among children that do school gardening activities. However, its findings failed to support that school gardening improves children's daily F&V intake.

2.5.7.2 *Social capital*

Eight quantitative studies explored social capital (Table 2-2). All of them have reported positive impacts or benefits of UA activities on social capital. Soga et al. [82] used a Social Cohesion and Trust Scale to statistically demonstrate that gardeners have greater social cohesion than non-gardeners. Litt et al. [80] reported on the social capital by exploring outcomes such as social involvement or collective efficacy of gardeners and the study concludes that urban gardeners have more involvement in social activities than non-gardeners. Based on the findings from the other studies, we can claim that UA gardeners have higher social support than non-gardeners [78]. UA can also positively influence friendship and adaptability between friends [79] or different ethnic groups [81].

2.5.7.3 *Health and/or wellbeing*

Among the studies that reported findings and outcomes related to health and/or wellbeing, some reported positive impacts of UA on physical health in general [33, 78] or physical health-related outcomes such as BMI and obesity risk [10] and improved muscle mass [98]. But UA activities do not always influence positively BMI as three studies [33, 78, 82] did not find significant positive impacts of UA on BMI. Other studies reported outcomes that were related to the health of people with mental disabilities [97] or mental health [82]. Three studies [45, 78, 98] also reported well-being as UA benefits. For example, Park et al. [98] found that UA activities improve psychological health of women by demonstrating that women participants of UA activities exhibit lower depression score compared to their control groups. Hawkins et al. [78] reported significant difference in perceived stress levels between allotment gardeners and other participants of indoor activities. One study [43] mentioned some health problems such as headache related to UA activities.

2.5.7.4 Sanitation and food safety

Among the quantitative studies that addressed issues related to health concerns or food safety, one [37] positioned food safety as one of the most important motivations for UA practitioners. Three studies [104, 109, 110] that assessed health risk due to heavy metal contamination were neutral because they found that the contamination of the soil or produce pose no risk to human groups assessed. The remaining studies reported potential adverse impacts of UA. Matthys et al. [111] and Stoler et al. [117] found significant associations between UA activities and the risk of malaria among urban farming households in Sub-Saharan Africa's region. Antwi-Agyei et al. [105] found that use of wastewater in UA can expose farmers in Africa to pathogenic agents such as *Escherichia coli*. Grace et al. [108] studies urban livestock and found that children under five years in dairy households were exposed more to *Cryptosporidium oocysts*. Other authors assessed potential contamination of urban soil and UA produce by heavy metals. Most of them agreed that accidental ingestion of UA soil [106, 115, 116, 119] or consumption of vegetables or other produce grown in contaminated UA soil [15, 16, 106, 107, 112–114, 118] may represent a risk for the health of different population groups (e.g. children and/or adults).

2.5.7.5 Income and cost savings on food

Quantitative studies also reported findings on income, cost savings on food, and/or employment. UA was reported as an activity that provides income to farmers in the African context [32, 122], other studies preferred to relate UA as an activity that allow practitioners to save money on food expenses and this statement has been put into evidence in different world regions such as North America [36, 47] or Sub-Saharan Africa [41]. A study conducted in the US by Algert et al. [34] states that UA allows gardeners to save \$339.00 by growing their own vegetables. Other studies [42, 43, 45] have reported the income related findings in terms of motivations and perceived benefits of UA practitioners.

2.5.8 Qualitative studies

2.5.8.1 Perceived benefits of UA

Out of 29 qualitative studies, 26 addressed several perceived benefits of UA for practitioners. The most mentioned benefits include contribution to food security and nutrition – in terms of access to fresh or healthier foods [51, 53, 92], enhanced health and wellbeing, foster social capital, strengthen cultural connections, education, savings on food expenses, and/or a source of income (Table 2-2).

2.5.8.2 Motivations on UA

The remaining three qualitative studies mainly discussed the motivations of people involved in UA. Among the wide range of motivations expressed by people engaging in UA, the studies mentioned: food or savings on food expenses, opportunity to build social connections, environmental consciousness, stress reduction, leisure, and other health related reasons (e.g. healthier lifestyle and/or diet diversity).

2.5.8.3 Challenges related to UA

Seven studies discussed challenges related to UA (Table 2-2). Among the main challenges discussed: insecure land tenure, violence perception, and food safety concerns of community-garden participants, and social exclusion due to people who feel excluded in some community gardens are concerns that may require attention from UA stakeholders.

2.5.9 Mixed methods studies

The evidence from mixed methods studies presents a set of UA impacts similar to those described in the previous sections for the quantitative and qualitative studies. However, the findings were dominated by qualitative evidence. Only six of the studies [64, 69, 71–73, 125] presented quantitative evidence in their findings. Panneerselvam et al. [73] and Mkwambisi et al. [71] presented findings that demonstrate that UA activities positively influence food security outcomes. For example, in Malawi, low-income female-headed households consumed 34.3 and 11% of the total UA harvest. The UA impacts have also positively influenced savings on food. In India, 30% of the farmers experienced 20–40% reduction in food expenditure [73]. Mlozi [72] also reported positive impacts of UA activities on food security and income, arguing that the profits of urban farmers were seven times higher than a senior government's official. However, it also addressed some concerns related to environmental damage from urban livestock. Miura et al. [70], who studies a set of nutrition and food security outcomes, was not able to conclude whether or not UA activities improved the diet of the participants. One study found that UA positively influenced social capital. For example, 87% of participating farmers agreed that relationship with their neighbours improved because of UA [73]. The remaining studies described a wide range of motivations, perceived benefits, and challenges of UA. Among the challenges documented is the fear due to potential food contamination and exposure of UA practitioners and their families to contaminants [77]. Gallaher et al. [120] and Kaiser et al. [121] assessed health risk perception due to UA activities in potential contaminated soil and found respectively that farmers and urban residents were aware and worried that potential hazards such as heavy metals could contaminate food grown in the gardens. Finally, other perceived burdens as barriers to participate in UA activities such as: hard work, getting dirty, and feeling unsafe [65] are also reported.

2.5.10 Level of influence of the outcomes

The included studies were categorized into three different influence levels (individual, household, and community) to measure or demonstrate the influence of UA on the determinants of health. Most of the studies from high-income countries demonstrate or measure the impacts at individual or community levels. On the other hand, studies from middle- and low- income countries explored the impacts mostly at household and individual levels (Fig. 2-3).

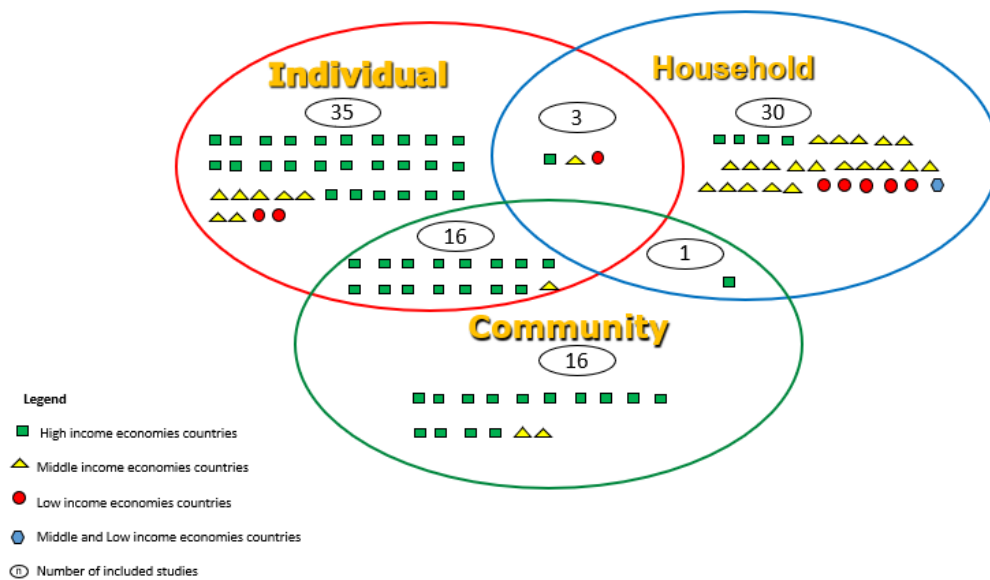


Figure 2-3 Number of included studies based on levels of influence of the impacts of UA on the determinants of health and country-income levels

2.6 Discussion

This scoping review used standard systematic review methods to identify, select, and synthesize findings from 101 studies that reported impacts of UA on the determinants of health. We documented the state of UA peer-reviewed literature by analyzing the geographic scope, country-level income, type of UA activities, and key findings on the main reported determinants of health. Below, we provide important information on the implications of the findings and the gaps that emerged from the results of this review that can be relevant for UA practitioners, researchers, and policy makers.

The results from the included quantitative and mixed method studies revealed some substantial evidence on the positive impacts of UA on food security and nutrition outcomes with increasing F&V consumption, improving food security status of urban farmers or nutritional status of children, food diversity, and/or dietary intake. However, this evidence has to be interpreted with caution. The outcomes reported are mainly based on cross-sectional surveys that rely on the participants' self-reported responses. Most studies did not use validated tools for food security and nutrition outcomes' measurement. In addition, in most cases, the authors do not always provide rigorous statistical evidence to sustain their findings. Other studies [39, 47, 70, 123] were not able to find enough evidence that justify the positive impacts of UA on food security or nutrition outcomes.

Although social capital is a determinant of health with limited reliable and valid measurement tools [130], it is less common to find studies that only use quantitative methods to measure social capital. In this review, social capital was an important determinant of health where the positive impacts of UA have been strongly supported by quantitative studies [79, 82]. Nevertheless, some caution regarding methodological limitations (cross-sectional studies without repeated measurements, sample size justification) should be considered when interpreting these findings as more rigorous studies are needed to corroborate the evidence.

Several studies reported the adverse impacts of UA on health by assessing the risks related to consumption of food grown in contaminated urban soil. However, the findings do not allow to draw definitive conclusions on this topic. Most of the findings are based on authors' assumptions of the amount of produce consumed or soil accidentally ingested by the population. This method is limited since it does not always reflect reality. In addition, regarding ethics, it may be difficult to find the right way to assess health risks. This is because it is unethical for researchers to intentionally ask participants to consume contaminated produce to take the correct measurements. To improve the reliability of this type of data, it is probably better to record the real amount of produce consumed by the studied population.

The findings from qualitative studies highlight a wide range of perceived benefits and motivations of UA. The benefits reported by UA practitioners were similar to their motivations. Supplying food in adequate quantity or quality, building social capital, improving physical and mental health, and saving on food expenses were the most common reasons and benefits perceived by UA practitioners. Other less common but important reasons include income, healthy lifestyle, and education and environmental consciousness [58, 83, 90, 101]. Other benefits of UA activities such as personal development have already emerged from other systematic reviews [131]. On the other hand, each study showed findings from their specific context. The results showed heterogeneity in the types of UA activities and diversity of the methods used. Unfortunately, we were not able to appreciate much difference between countries' income level and the outcomes assessed.

In this case, most of the determinants of health' themes emerged were explored in high-, middle-, and low-income countries. Lifestyle and cultural connection were the only two themes that appeared in high-income countries but did not in middle- or low- income countries. We expected some outcomes such as food security and nutrition to be associated more with middle- and low- income countries. However, they were also importantly assessed in various studies from high- income countries. This highlights a fact that other authors have already pointed out that food is also an important function of UA in the context of high-income countries [132].

We also found that scholars from high- income countries are more likely to study the impacts of UA at individual and/or community levels while studies from middle- and low- income countries are more likely to explore the contributions of UA on determinants of health at household and individual levels without considering the

community aspect. This trend can be explained by the fact that community gardening is a type of UA with more presence in high-income countries [20] compared to other low- and middle- income countries where other types of UA such as home gardening or urban farming are more common. In other words, the urban farming as a larger type of UA practiced in middle- and low- income countries, is more likely to engage the entire household unlike the community gardens where sometimes the plots are smaller and only one member of the household is involved.

Another important aspect that was observed from our review is the lack of transnational or multi-city studies. Only one included study, Frayne et al. [39], which published findings from the same data as Crush et al. [6], was conducted in more than one country. Only seven out of 101 included studies have been conducted in more than one city. These findings prove that despite the diversity in the geographic scope and types of UA of the existing academic literature, UA remains a topic studied in specific or local contexts and that partly limits the capacity to generalize its potential impacts on specific determinants of health.

Aside from the US and Sub-Saharan Africa, there is limited peer-reviewed research in other world regions where UA is highly recognized and practised. For example, we did not find eligible studies in the Latin American and Caribbean's region. However, cities from this region such as Belo Horizonte in Brazil, Havana in Cuba, Rosario in Argentina and Quito in Equator have been widely recognized as successful UA cases for their urban and peri-urban food practice and policy [133]. Among the possible explanations for the lack of studies from other world regions are the dominance of the academic literature on UA by countries from North America and Sub-Saharan Africa, and the exclusion of peri-urban area in our definition of UA. In addition, our review only considers English language bibliographic databases and journals, which may have overlooked relevant studies published in other languages. However, since English is considered a hegemonic language in the international scientific literature [134], we also expected to retrieve more eligible papers published in English from other world regions where English is not the first language.

All types of studies (quantitative, qualitative, and mixed methods) were predominantly qualified as weak or moderate. The inconsistent or incomplete reporting of results from some included studies were due to lack of details on study settings, sample size justification, data collection, ethical issues, statistical evidence for quantitative studies, and theoretical approaches for qualitative studies. These arguments strongly support a lack of methodological rigor in the evidence of the impacts of UA peer-reviewed literature and add on the evidence already mentioned by several authors [18, 19, 21].

2.6.1 Strengths and limitations of this scoping review

This review applied a systematic and rigorous search strategy that retrieves several articles to answer our research questions and objectives. As our topic was focused on UA and health, several well-known electronic bibliographic databases related to health, nutrition, and agriculture were used as primary sources. Each element

from the PICOS framework was searched with multiple keywords to target all relevant studies [27]. However, we may have omitted some relevant studies published in other languages. Based on the geographic scope of the included studies, it is important to point out the existence of English language academic literature on the impacts of UA, but it is mostly focused on the US and some countries in Sub-Saharan Africa. No study on air pollution and UA was included in our final analysis. This can be explained by the fact that we have unintentionally omitted air pollution as a key word in our search strategy. Additionally, we only considered peer-reviewed articles without assessing the existing evidence in the grey literature. The non-consideration of the grey literature restricts our findings to what was reported by scientific journals and possibly prevent the analysis of relevant cases that were rejected for publication by scientific editors.

2.6.2 Study implications

Our study reveals a need for more rigorous studies to demonstrate the impacts of UA on health-related outcomes and the possibility of exploring more transnational and multi-city research approaches to enrich the understanding on different contexts. This will help document best practices that can be implemented across different settings and contexts. As we stated earlier, UA remains a topic studied in specific or local contexts and that partly limits the capacity to generalize its potential impacts on specific determinants of health. By combining positive and adverse impacts of UA on the determinants of health, this review takes a holistic approach to invite practitioner, and policy makers to address UA challenges while promoting it. The insights gained from this study will encourage practitioners to test the urban soils prior to growing UA produce.

2.7 Conclusion

This study illustrates a global picture of the current academic literature on the impacts of UA on the determinants of health. The study also designs the paths for future research in public health and urban planning domains. The inconsistency and the lack of strong quality in the methodology of the included studies are proof that more rigorous studies are needed to demonstrate the positive and adverse impacts of UA on different determinants of health. Nevertheless, the substantial existing evidence from this review corroborate that UA can influence different determinants of health such as food security, social capital, health and well-being in a variety of contexts (high-, middle-, low- income countries). In addition, UA practitioners can be motivated by social benefits such as supplying quality food and building social capital. There are also many physical and mental health benefits to different population groups. In a holistic sense, the evidence suggests benefits of UA on multiple dimensions of health with few adverse effects; thus, UA can be recommended as an intervention that positively influence the determinants of health. Concerns regarding urban soil contamination must be addressed by analyzing physical and chemical properties of the soil and applying decontamination techniques when needed to ensure that there are no health risks to UA users. Finally, we advocate for greater impact assessments by including transnational

and multi-city approaches to compare the findings in different countries' income level and geographic contexts. We also need a unified language to deal with heterogeneity in different types of UA identified.

2.8 Acknowledgements

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2.10 Authors' contributions

PPA and AL conceptualized the scoping review. PPA and MAF identified, selected, extracted data, and appraised the quality of the included studies. PPA wrote the manuscript of the scoping review with critical inputs and appraisal from MAF, GC, and AL. All authors have read and approved the manuscript.

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Chapitre 3 — Motivations des pratiquants de l'AU dans les quartiers défavorisés : Étude comparative entre Montréal et Quito

3.1 Résumé

Les résultats de la revue systématique ont identifié des lacunes dans la portée géographique et la qualité des démonstrations empiriques existantes dans le domaine de l'AU. Ils ont aussi souligné l'importance d'adopter une approche holistique dans ce domaine, en menant des études transnationales ou observant la situation dans différents contextes. Le croisement de l'observation de plusieurs villes de différents statuts socioéconomiques permettrait de mieux contraster les motivations, les bénéfices perçus et les défis des pratiquants de l'AU.

Ainsi, ce chapitre a pour objectif de décrire les motivations des individus qui pratiquent l'AU dans des quartiers défavorisés, en dressant leur profil. Il présente une démarche empirique comparative entre Montréal (Canada) et Quito (Équateur) pour une meilleure compréhension des motivations individuelles ainsi que des défis auxquels les pratiquants de l'AU sont confrontés. La revue systématique a servi d'inspiration pour élaborer la stratégie, l'outillage et réaliser cette étude. Un guide d'entretien semi-directif a été élaboré dans le but de collecter des données sur les parcours de vie, sur l'intérêt de pratiquer l'AU et sur les éléments pouvant faciliter ou compliquer cette pratique. On a ensuite réalisé un total de n= 44 entretiens individuelles dans les quartiers de Villerey et Parc-Extension à Montréal entre août à novembre 2018 et les quartiers de Quitumbe et Turubamba à Quito entre janvier à mars 2019. L'ensemble des entretiens représente un total de n = 36 pratiquants de l'AU et n = 8 promoteurs de l'AU (employés des organismes qui font la promotion pour l'AU). Les entretiens ont été enregistrés et retranscrits en verbatim pour être codés dans le logiciel Nvivo12 (QSR International Pty Ltd) — les motivations généralement citées dans la littérature et présentées dans le chapitre antérieur ont été utilisées comme codes. Les discours ont été analysés pour identifier les similitudes et les différences entre les deux villes. De cette analyse, nous avons tiré une typologie de pratiquants (éco-engagés, socio-engagés, éco-experts et les pratiquants versatiles) basée sur leurs motivations à s'engager dans l'AU. On a, à la fin, présenté une analyse thématique des motivations des pratiquants dans les deux contextes étudiés.

Cette étude nous amène à constater que les pratiquants identifiés comme étant les éco-engagés et socio-engagés sont beaucoup plus présents à Montréal, alors que les types écono-experts et versatiles caractérisent les pratiquants de Quito. Les résultats indiquent également que les motivations pour participer à l'AU dans les deux villes sont liées à l'autoproduction d'aliments sains, à la santé et au bien-être, au renforcement de capacités et du capital social et des bénéfices économiques— épargnes sur les dépenses alimentaires, revenus. Si, à Montréal, c'est l'aspect du bien-être et de la santé mentale qui sont au premier plan, à Quito on met plutôt

l'accent sur les apports de l'AU à la santé physique. En effet, dans la métropole équatorienne, l'activité est perçue comme un outil de renforcement économique avec un rôle non négligeable dans les apports alimentaires des ménages. Cependant, la notion de capital social est beaucoup plus mise en avant par les pratiquants à Montréal qu'à Quito. On remarque aussi que le mode d'organisation des jardins communautaires peut favoriser une culture individualiste. Les participants de cette forme d'AU ne cherchent pas forcément à renforcer leur capital social. Enfin, nous soutenons que les motivations des pratiquants, dans les deux cas d'étude, pourraient servir de fondements pour encourager un certain nombre d'interventions dans le domaine de la santé publique. Nos observations gagneraient à influencer les politiques publiques afin d'encourager l'AU dans les quartiers défavorisés. À Quito, la municipalité joue déjà son rôle en insérant les projets d'AU dans une démarche de politique alimentaire durable. À Montréal, un meilleur appui aux initiatives d'AU des organismes communautaires pourrait aider la municipalité à faire face à la demande grandissante pour les jardins communautaires.

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The motivations of urban agriculture practitioners in deprived neighborhoods: A comparative study of Montreal and Quito

Pierre Paul Audate^{1,2,3} MSc; Geneviève Cloutier¹ PhD; Alexandre Lebel^{1,2,3} PhD

¹ Graduate School of Land Management and Urban Planning, Laval University, Québec, QC, Canada

² Centre for Research on Planning and Development (CRAD), Laval University, Québec, G1V 0A6, Canada

³ Evaluation Platform on Obesity Prevention, Quebec Heart and Lung Institute, Québec, QC, Canada

Corresponding Author:

Pierre Paul Audate, MSc

Graduate School of Land Management and Urban Planning

Laval University

Pavillon Félix-Antoine-Savard, bureau FAS-1616

2325, allée des Bibliothèques Université Laval

Québec, QC,

3.2 Abstract

Urban agriculture (UA) is increasingly used as a strategy to improve food environments and the aesthetic of urban areas in different socioeconomic contexts. However, little is known about the characteristics and motivations of UA practitioners and how socioeconomic contexts may shape their motivations. This study provides an empirically-grounded understanding of the characteristics and motivations of UA practitioners, as well as the challenges they face, in deprived neighborhoods of two cities with different socioeconomic contexts: Montreal, Canada and Quito, Ecuador. A total of n=36 UA practitioners and n=8 UA promoters were purposively interviewed. The interview guides included open-ended questions in order to capture relevant information and nuances of the participants regarding the origin of their interest, their perceptions, and motivations related to UA. Individuals' discourses were analyzed to identify similarities and differences between the two cities, through which we developed a typology based on the motivations of UA practitioners. We found that practitioners categorized as the Eco-engaged and Socio-engaged types are more predominant in Montreal, whereas the Econo-expert and Versatile-caretaker types characterized the practitioners in Quito. The findings also indicate that the motivations for participating in UA in both cities are related to the self-provision of healthy food, health and wellbeing, empowerment, social capital, and economic rewards. We argue that these motivations represent health-related outcomes that should influence urban planning policies, to encourage UA in deprived neighborhoods.

3.3 Introduction

Urbanization tends to facilitate the expansion of large-scale food industry, availability of unhealthy food, and nutrition transition of urban dwellers [1]. These developments, in combination with other factors such as lifestyle alterations, contribute to detrimental urban environments associated with public health crises, such as the obesity epidemic [2]. In addition, the growing urban population worldwide is a hindrance to the availability of suitable land to ensure adequate food access in municipal areas, particularly in deprived neighborhoods. While a large number of cities have already taken actions to shape their food environment, most urban residents remain separated from the origin of their food [3, 4]. In this context, innovative food production practices are enhancing city landscapes and providing ecological services to urban dwellers in high-, middle-, and low-income countries. For example, urban Agriculture (UA) is increasingly used as a strategy to facilitate access to healthy food environments and to increase the aesthetic quality of urban areas [5]. In addition to these roles in health and urban planning, UA is a multi-functional activity that influences urban food systems in different socioeconomic contexts [6].

UA is practiced in small-scale forms, including community gardening (producing food on public land with individual plots); collective gardening, in which food is produced communally on private land; and guerilla gardening, defined as an informal movement to occupy space for food production without legal consent [7-9]. Furthermore, it is practiced on larger scales in the form of urban farming and commercial rooftop gardens. UA is also known by other names, depending on where it is practiced, such as school, home, or backyard gardening. People who are actively engaged and produce food in these different forms of UA gardens, are recognized as UA practitioners [10].

Despite numerous challenges such as lack of institutional legal frameworks, land competition, and risk of eviction, UA practitioners spend time and effort to maintain UA practices in cities worldwide [11, 12]. In the same vein, their growing interest on maintaining UA in the city landscape suggests that very little is known about their characteristics and motivations. Greater insights into their motivations and how they are shared across UA activities will help to ensure that different forms of UA gardens continue to exist and attract support from local government and the public [12, 13].

While prior research has attempted to understand the driving motives of UA practitioners, most of those studies have been conducted in high-income countries, and this literature is not specifically focused on deprived neighborhoods [14]. For example, Trendov [15] studied community gardens in five capital cities of Central Eastern Europe and found that environmental function, recreation, and leisure were the main motivations of gardeners. In Milan, Ruggeri et al. [16] observed that personal well-being, pleasure, and the desire for more nutritious fresh food were the leading motivators. Studying two contrasting neighborhoods in Toronto, Kortright

and Wakefield [17] found other factors to be the driving motives of home gardeners, including access to fresh food, education, environmental awareness, and aesthetics, in addition to the self-satisfaction motivation. They also argued that growing food contributes to community food security by enhancing accessibility to a more nutritious diet. Pollard et al. [18] compared home and community gardening in Australia, concluding that food production, enjoyment, and health were the dominant motivations among home gardeners, while enjoyment and connection to others were more important in community gardening. Based on this literature, we know that access to fresh food can be important for different types of gardeners, even in high-income countries [19]. While the provision of food through UA can be important for gardeners in high-income countries, personal well-being and social capital tend to be more greatly appreciated [20].

UA's contribution to building social capital is also considered a priority in middle- and low-income countries. Studies have demonstrated that even with precarious levels of food security, home gardeners in middle-income countries seem to value the food they grow as much for its social value as for its contribution to their families' subsistence [17]. Since motivations can be subjective and affected by local contexts [16], we cannot ignore that the provision of food may also be the most important motivation for some urban gardeners in middle- and low-income countries. Numerous studies have already demonstrated the contribution of UA to food security in low- and middle-income countries, particularly in Sub-Saharan Africa [14, 21, 22].

Proponents of UA tend to implement projects with a food or socio-environmental justice approach in less privileged neighborhoods [23, 24]. This kind of approach is particularly promoted in urban neighborhoods of middle- and low- income countries where the role of UA in coping with food insecurity has been demonstrated [25]. For example, Simatele and Binns [26] demonstrate how UA even in a context of restricted regulations contributes to food security and economic empowerment in deprived neighborhoods of Lusaka. UA studies in deprived contexts, however, do not always shed light on the motivations of the participants. Despite an existing corpus on the types of motivations for UA activities, minimal research has been conducted to analyze the drivers of participation in deprived neighborhoods [27, 28]. The questions we explored in our research are regarding the motivational factors that impel UA practitioners in deprived neighborhoods to get engaged in UA activities, and how these motivations are perceived in different socioeconomic contexts. The main purpose of this study is to provide an empirically-grounded understanding of the characteristics and motivations of UA practitioners, as well as the challenges they face, in deprived neighborhoods of two cities with different socioeconomic contexts. The preceding literature review has suggested the need to expand the geographical scope of peer-reviewed and multiple-city UA studies [14]. In the present study, we develop a typology to analyze the motivations of UA practitioners in Montreal and Quito through the lens of self-determination theory [29]. This will be relevant for policymakers and will provide an in-depth understanding of practitioners for those who look to support or mobilize

more UA users in cities around the world independently of the socioeconomic contexts. Indeed, the sites of this study come from two countries with contrasting socioeconomic status.

3.3.1 Theoretical background

Self-determination theory (SDT) is a dynamic principle that predicts and explains individual behaviors. It assumes that behaviors are autonomous and controlled by oneself [29]. For instance, personal interests inspire individuals to take particular action. This theory is based on empirical evidence to explain different types of motivation based on the fundamental reasons that incite the action. Intrinsic and extrinsic motivations have been widely studied as both dependent and independent constructs [30]. An intrinsic motivation refers to doing an activity because of self-satisfaction, personal enjoyment, or interest, while an extrinsic motivation refers to doing something because of external incentives beyond one's control [29]. Built on Hull [31] learning theory of the physiological drivers of motivations, Ryan and Deci [29] agree that intrinsically-motivated activities provide satisfaction by meeting psychological or innate needs. As such, the theory places "the needs" into three categories: (a) autonomy, or the need for self-control; (b) competence, or the need to produce desired outcomes; and (c) relatedness, or the need for connection with others [32]. It maintains that when conditions meet these basic needs, such as food, achievement, or belonging, an individual's motivations and performance will be increased. Whereas autonomy and competence are strictly intrinsic motivations associated with self-sufficiency and self-efficacy, relatedness can be seen as intrinsic or extrinsic depending on the context [33]. For example, relatedness can be understood as a need to be socially accepted by others. In this case, it provides self-satisfaction and is therefore considered an intrinsic motivation. However, relatedness can also be a social reward, such as approval or acceptance by others, or a desire to increase the number of acquaintances when integrating into a group or a community. In this case, relatedness is an extrinsic motivation driven by an external reward [34].

In this research, intrinsic and extrinsic motivations are used to analyze the reasons expressed by participants to engage or stay engaged in UA. When the motivations entail a challenge, or are interest based or basic-needs based, they are considered intrinsic. In contrast, when the reasons are associated with external rewards, such as economic incentives or social acceptance, they are considered extrinsic motivations. The application of SDT is in line with the work of Ramirez-Andreotta et al. [35], who have also used this theory to study motivations in community gardens in Boston. The SDT as a theoretical framework has been proven effective for its cross-cultural applicability [36]. In our case, we use two different cities with contrasting socioeconomic contexts to construct a typology of UA practitioners and to describe their motivations and perceptions.

3.4 Materials and Methods

3.4.1 Context

This article presents a study conducted in Montreal, Canada and Quito, Ecuador – two cities with contrasting socioeconomic contexts. Montreal is the largest city in the province of Quebec. The agglomeration of Montreal is home to approximately 1.9 million inhabitants, occupying 499 km². The municipality of Quito is the capital city of Ecuador and has an estimated population of 2.7 million, occupying 372.4 km². The average yearly income for residents of Montreal was approximately \$39,581 USD in 2017, while in Quito the basic annual salary was \$4,728 USD at the time of data collection in 2019, at least eight times less. Both cities reflect the global trend toward urbanization and are considered densely populated [37, 38].

In Montreal, UA has a long history with community gardens that were institutionalized by the city authorities in 1973 [39]. Since then, the community garden program has been administrated by the city's Department of Sports and Leisure (see an example of community gardens in Montreal Fig. 3-1). Some constraints related to community gardening in Montreal, such as long waitlists for new participants, contributed to the creation of a new form of UA in the early 2000s, called collective gardening [39]. In contrast to the community gardens that are administrated by city authorities, collective gardens are managed by non-profit organizations or other organized groups on private lands.



Figure 3-1 Community gardening site in Villeray, Montreal

In Quito, UA has also been practiced for decades, however it only took on a structured form since the beginning of the 2000s. The current, organized UA was initiated by a United Nations program that brought together different actors, including the mayor, grassroots organizations, and international cooperation agencies, as part of a consultation process on UA in Quito. The result of the consultation was an interest in the development of UA in the city. As part of an agreement following the consultation, an action plan was constructed that included a pilot project in Panecillo, one of the most dangerous neighborhoods of Quito at the time. Since then, the project AGRUPAR, the program's acronym in Spanish meaning "Participative Urban Agriculture", has been implemented through the economic development agency of the city, CONQUITO. Today, the AGRUPAR project supports different forms of UA initiatives throughout Quito, such as family, school, church, and collective gardening, or "huerta comunitaria" as these initiatives are known locally. More than 3,000 gardens in the city have already been constructed through the AGRUPAR project, which has also initiated efforts to endow Quito with a food policy (see an example of collective gardens in Quito Fig. 3-2).



Figure 3-2 Collective gardening site in Quitumbe, Quito

Despite this long tradition of UA practice in these two cities, UA practitioners continue to face many challenges. On the one hand, there is no legal framework to provide incentive to the practitioners as it is the case for traditional rural farmers. On the other hand, the development of diversified forms of UA practice makes it more difficult for practitioners to obtain support. For example, in Montreal, there is no existing structured program for

the collective gardens, each organization determines its own strategies. In Quito even though the UA program is centralized there is no homogenous form of practice. Therefore, it is difficult to fully assess the impacts of UA activities on the practitioners' living conditions. For example, it is possible that the importance of the production aspect, compared to the pretexts for social activity, might be over-valued in the Quito socioeconomic context or undervalued in the Montreal context [27].

3.4.2 Study areas

The study was conducted in two neighborhoods in each city: Parc-Extension and Villeray in Montreal, and Quitumbe and Turubamba in Quito. Along with Saint Michel, Villeray and Parc-Extension form the second most populated district in Montreal. This district has a primarily young population, with an average age of 36.1, lower than the city average age of 38.6 [40]. A study conducted in 2004 for the Montreal Regional Council of Elected Officials classified the district among those with the highest percentage of low-income families (34.3%) in the city [41]. Both neighborhoods have different types of UA activities, such as community, collective, home gardening, etc. The Quitumbe and Turubamba neighborhoods are both in the southern part of Quito. They are part of the administrative district of Quitumbe, an area with an average age of 26.3, lower than Quito's average age of 29.5. This district is one of the most affected by poverty in the capital city. The number of years of education of its population is also lower compared to the rest of the capital.

These four neighborhoods were chosen because they have a certain level of deprivation compared to other areas of the cities in which they are located. Deprivation in this research is understood as an observable and demonstrable disadvantage relative to the city or national context. It includes a material dimension or inadequate access to resources and a social dimension or social networks fragility [42]. Another selection criterion was the presence of local organizations responsible for implementing UA activities. These organizations not only were able to provide logistics support to the researchers, such as recruitment and a space to interact and interview the participants, but also allowed us to better understand the social relatedness of the participants in the research. In Parc-Extension and Villeray, the local organizations VRAC-Environnement and Maison Quartier Villeray (MQV) that implement collective gardening activities, helped identify potential participants for our study. MQV alone manages more than 15 collective gardens in private homes and schools. In Quitumbe and Turubamba, the AGRUPAR team helped with the process of identifying potential participants for our study.

3.4.3 Data collection and analysis

Based on its exploratory nature, this study used a qualitative method design to collect and analyze data in the four neighborhoods. Purposive sampling using minimum quotas [43] was used to recruit participants in Montreal (n= 21) and in Quito (n= 23). Invitations to participate in the study were extended through local organizations as mentioned above. In each city, we recruited two types of participants to generate a deeper understanding of perceptions of UA practitioners and promoters. The number and types of UA promoters are presented in Table 3-1.

Tableau 3-1 Number of UA promoters interviewed by city

City	Montreal	Quito
N	3	5
Type of institution		
Municipal entity	1	2
School	1	2
NGO	1	0
Church	0	1

Semi-structured interview guides and a questionnaire were approved by a multidisciplinary research ethic board (REB # 2018-157). The questionnaire included a set of closed questions to obtain demographic and socioeconomic information (Table 2). The interview guides included open-ended questions to capture relevant information and nuances of the participants about the origin of their interest, motivations for UA, and the challenges they face. The interviews were conducted in person, at a garden, at the office, or at the home of the participant. All interviews were recorded and transcribed. The accuracy of the transcripts was verified with the audio recordings of the interviews.

Given the qualitative approach used, we coded the transcripts through NVivo 12 (QSR International Pty Ltd) to track themes of interest across interviews. We started with a pre-defined list of codes to capture the motivations, perceived benefits, and challenges of UA. We also added new codes as other themes emerged from the transcripts. The first two authors agreed on the main parent codes categories. A total of 11 parent codes were identified during this process. One researcher coded the transcripts, and another reviewed the contents of the parent codes to ensure appropriate coding and to validate the coding results. The most relevant direct quotations in French and Spanish were translated into English by a trilingual coauthor to support our thematic analysis.

We analyzed the data through the lens of SDT. More precisely, we look at SDT three dimensions: self-control, competence or desired outcomes and relatedness. These dimensions are translated into individual motivations' indicators such as self-provision of food, health and well-being, achieving competence, social capital and

economic rewards. These indicators serve as variables to construct a matrix, as suggested by Collier et al. [44], for the typology's structure of UA practitioners.

For each theme presented in the following section, we systematically identified similarities and differences between the two cities studied and we drew conclusions based on patterns observed. The themes are also supported by quotes from interview participants to describe intrinsic and extrinsic motivations and challenges perceived by the UA practitioners.

3.5 Results

3.5.1 Characteristics of UA practitioners in deprived neighborhoods

This section presents the findings from 36 interviews of UA practitioners in Montreal and Quito (Table 3-2). Women represented a greater proportion of those interviewed in both cities, 61% in Montreal and 78% in Quito. The average age of the UA practitioners in Montreal and Quito was also similar. In Montreal, however, most of the practitioners interviewed had completed a university degree and had stable non-UA employment, whereas in Quito, most of the practitioners who were interviewed had only a primary or secondary level of education, and many were unemployed.

Tableau 3-2 Demographic and socioeconomic characteristics of the interviewed UA practitioners by city

City	Montreal		Quito			
N	18	100%	18	100%		
Neighborhoods	Parc-Extension Villeray	n= 6 n= 12	33.3% 66.7%	Quitumbe Turubamba	n= 9 n= 9	50.0% 50.0%
Gender						
Men	7	38.9%	4	22.2%		
Women	11	61.1%	14	77.8%		
Age						
18 – 45	6	33.3%	5	27.8%		
46 – 65	8	44.4%	11	61.1%		
>66	4	22.2%	2	11.1%		
Education level						
Primary	1	5.6%	5	27.7%		
Secondary	1	5.6%	9	50.0%		
Professional	3	16.7%	1	5.6%		
Undergraduate	9	50.0%	3	16.7%		
Postgraduate	4	22.2%	0	0.0%		
Non-UA Employment						
Unemployed	3	16.7%	9	50.0%		
Employed	11	61.1%	3	16.7%		
Independent worker	0	0.0%	5	27.8%		
Retired	3	16.7%	1	5.6%		
Other	1	5.6%	0	0.0%		
Monthly income						
<\$100 USD	1	5.6%	3	16.7%		
\$101 – 500 USD	3	16.7%	12	66.7%		
>\$501 USD	14	77.8%	3	16.7%		
Household structure						
1 adult without children	11	61.1%	1	5.6%		
1 adult with children	0	0.0%	3	16.7%		
Couple without children	4	22.2%	0	0.0%		
Couple with children	2	11.1%	14	77.8%		
Other	1	5.6%	0	0.0%		
Area where they grew up						
Rural	2	11.1%	11	61.1%		
Peri-urban	6	33.3%	1	5.6%		
Urban	10	55.6%	6	33.3%		
Immigration status						
Immigrant	8	44.4%	0	0.0%		
Non-immigrant	10	55.6%	100	100%		

Household structure, income, and origin of the practitioners were also those aspects that differentiated the Montreal and Quito cases. More than half of the UA practitioners in Montreal were adults living alone. This demographic characteristic correlated with municipal data, which indicate that two of every five private households were composed of people living alone [37]. In Quito, on the other hand, more than 75% of

households were made up of couples with children. In Montreal, more than half of the UA practitioners had grown up in an urban area, while in Quito, most of the practitioners had been raised in rural areas.

3.5.2 Typology of UA practitioners

In this section, we propose a non-exhaustive typology of UA practitioners in deprived neighborhoods. Despite the difficulties of observing a typical profile of a practitioner in each city, four types emerged based on their characteristics and motivations for growing food: Eco-engaged, Socio-engaged, Econo-expert, and Versatile-caretaker practitioners (see Table 3-3 and Fig. 3-3). This distinction of practitioners by their types is used to underline how intrinsic and extrinsic motivations are interrelated and follow different patterns, depending on the personal and socio-economical contexts.

Tableau 3-3 Framework for a typology of UA practitioners

Motivations	Intrinsic			Extrinsic	
	Self provision of food	Health and well-being	Achieving competence: Empowerment	Economic rewards	Social capital
High	Econo-expert Versatile-caretaker	Eco-engaged Versatile-caretaker	Eco-engaged Socio-engaged Versatile-caretaker	Econo-expert Versatile-caretaker	Socio-engaged
Moderate	Eco-engaged Socio-engaged	Socio-engaged			Versatile-caretaker
Low		Econo-expert	Econo-expert	Eco-engaged Socio-engaged	Eco-engaged Econo-expert

Note: Adapted from "Typologies: Forming Concepts and Creating Categorical Variables" by Collier et al., 2008, In "The Oxford handbook of political methodology" (J. M. Box-Steffensmeier, H. E. Brady and D. Collier, eds.), pp. 152-173. Copyrighted 2008 by Oxford University Press.

3.5.2.1 The Eco-engaged practitioner

The Eco-engaged practitioner is a type that encompasses young adults with mostly university degrees and stable employment. The majority are fervent critics of the contemporary food system, they have a strong environmental awareness, and they enjoy spending time outdoors. They believe having good nutrition will keep them healthy. Eco-engaged practitioners look for activities that contribute to their mental health and healthy lifestyle. They see UA as a means to take a break from their professional work environment, consume chemical-free foods, and relax. Although lacking a background in agriculture, they are open to learning. In Montreal, we find them in both collective and community gardening. They have developed a passion for UA and are willing to go to great lengths to be able to stay engaged. For example, one collective gardener travels 2.5 hours to

Montreal every weekend during the season to work in the garden. This type of practitioner is not common in the neighborhoods we studied in Quito.

3.5.2.2 The Socio-engaged practitioner

Socio-engaged practitioners look for collective benefits. As a group, members typically have different educational backgrounds and varying degrees of previous experience with agriculture. They seem to be more motivated by the desire to meet other people, share with others, and strengthen social ties. They value the freshness of produce from the gardens, although not all are necessarily seeking healthier food through UA. Their relatedness with others is closely associated to their well-being. They like being part of a group, sharing, and learning. We find the Socio-engaged type mostly in the collective gardens of both cities.

3.5.2.3 The Econo-expert practitioner

The Econo-expert practitioners have prior experience in agriculture, generally having grown up in rural or peri-urban areas and having completed some high school. In some cases, they have learned agricultural practices from their parents. After moving to the city, they see UA as a way to reconnect with their past or their culture. They are less concerned about the environment and more motivated by the economic rewards of their plots. They put more emphasis on the production aspect of food, and they try to increase their yield. In Montreal, this group is composed mostly of immigrants, many of whom have a presence in the community gardens. Some plant crops that they would have grown in their country of origin and cannot find at the supermarkets in Montreal. In Quito, the Econo-expert practitioners have experienced agriculture in rural or peri-urban areas. This type of practitioner advocates for bigger gardens and wants more space to grow greater quantities of food.

3.5.2.4 The Versatile-caretaker practitioner

This type is essentially composed of women with children who are head of the household. The majority do family gardening at home. We defined them as Versatile-caretaker practitioners because they have similar motivations with all the previous types, and they are involved in a wide variety of gardening activities at home and in their communities. Like the Econo-expert practitioners, the majority have completed some high school and have experienced agriculture in the past. They are motivated by the yields of their plots. They grow nutritious, chemical-free food to feed their families, save money on their food expenses, and in some cases, generate additional income. They differ from the Econo-expert practitioners regarding their belief in sustainable practices. Like the Eco-engaged practitioners, they firmly believe in organic agriculture and use waste to make compost. They are moderately motivated in building their social capital. We find them predominantly in Quito.

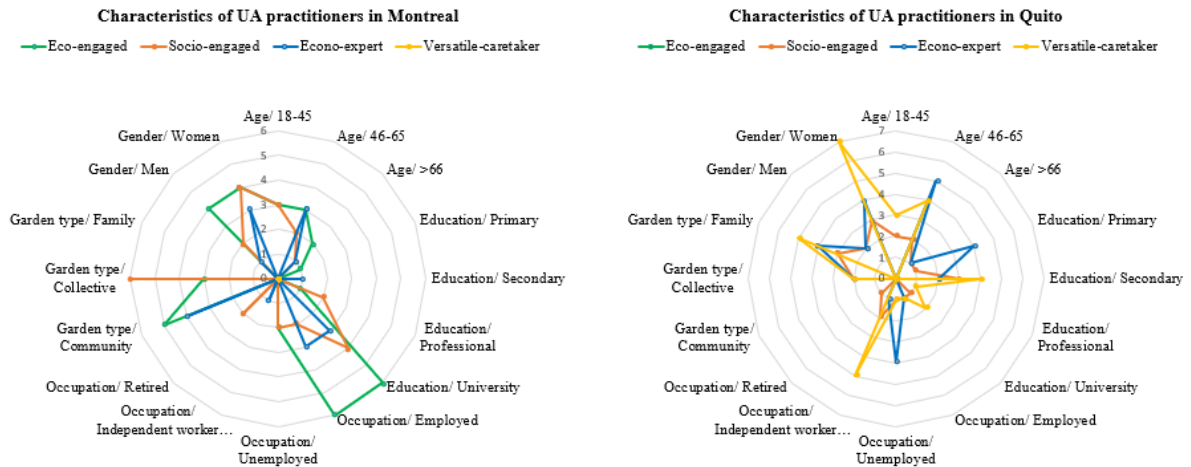


Figure 3-3 Typology of UA practitioners by city

3.5.3 Intrinsic motivations

3.5.3.1 Sense of pride in self-provision of healthy food

Interviews with UA practitioners in both Montreal and Quito indicated that most were motivated by the food production function of their gardening activities. They valued the fact that their activities allowed them to consume quality food, as well as having knowledge about the origin of their food. For most of the UA practitioners in Montreal, UA plays an important role in their healthy eating habits, ensuring that they eat healthy and fresh produce. They translate these benefits of producing their own food into a sense of pride. At least two practitioners, one from community garden and another from collective gardening, compared the beauty of their plots to a masterpiece to be proud of: “It is like an artist who paints a great picture, when you arrive in your garden plot and look at these beautiful and fresh vegetables, and you know you have a good production, that makes you proud” (Econo-expert practitioner, Montreal). “It is a bit like an artist with his artwork, when you come from your garden with beautiful vegetables. It is something that I’m proud of” (Socio-engaged practitioner, Montreal).

Additionally, UA activities make them more aware of the importance of healthy diets. This awareness is evident in comments which illustrate a motivation to stay engaged in UA activities. One of the Eco-engaged practitioners in Montreal said: “(...) I think it really changed my diet. Now I’m pretty vegetarian, I eat meat two or six times a year, and the reason is because I eat things that I harvest here”.

Two dynamics were identified from the production of food in the deprived neighborhoods studied in Montreal. On the one hand, the UA practitioners of collective gardening are more motivated by the quality of their produce.

These practitioners do not tend to grow a substantial quantity of food to sustain themselves or their households. They see their activities as a way to consume organic fresh produce, which in their opinion is of better quality than that of the supermarkets. Many of them are environmental activists and critics of contemporary food production systems. They are not particularly concerned about maximizing their production yields. On the other hand, most of the community garden participants interviewed are passionate about food production. They devote their efforts to obtain sufficient fresh produce at the end of the season. Some of them opt for traditional cultivation methods with less diversification or use of chemical products, to maximize their production.

Similar patterns were observed in Quito, where most of the practitioners implement UA activities for the purpose of achieving self-sufficiency in food. However, for some practitioners in Quito, UA is not only a means to be food self-sufficient but is also a way to have access to chemical-free foods. Having this opportunity makes them proud. One Versatile-caretaker practitioner in Quito has this to say:

(...) Likewise, the produce is healthy, it has no chemicals and that's how we like to eat. I mean, the produce is richer and tastier without chemicals. It is good that we do not use chemicals to produce, because nowadays people use pesticides everywhere and that damages the body (...).

From the perspective of organizations that promote UA in deprived neighborhoods of Quito, the provision of food goes beyond the concern for making quality food accessible to urban dwellers. It is viewed as a way to help them understand that food is not a luxury, but rather a right and an obligation. Promoting UA among vulnerable populations is also an act of resilience due to potential threats related to the topographical zones of Quito.

Quito's topography makes the city very vulnerable to the effects of climate change. Here, we talk about excessive rains, landslides, and the territory itself has many trees around, yes, it makes it susceptible to fires. Then, above all, the issue of volcanic eruption that is the main risk now for the city. Quito has only one main entrance road to the city. And the city is highly dependent on external food provisioning. If the road is blocked due to volcanic eruption, the food flow to the city will be suspended. Having the citizens thinking this way based on science and life makes them understand that having more UA in the most vulnerable areas is better (...) (UA promotor, Quito).

3.5.3.2 *Health and well-being*

Many of the UA practitioners interviewed in Montreal have a concerted perception that UA activities positively influence their mental health. Some of them greatly valued the role of UA activities such as watering the plants, caring for the plot, and harvesting the produce as stress and anxiety reducers. For others, UA brings another meaning to their life. When in their garden, they feel refreshed, and they engage their mind in a different way

while putting behind their daily concerns. As one Eco-engaged practitioner in a collective garden in Montreal said:

I garden because I like working the land. But especially because it's a natural outlet. I do not think about anything else. I have no more worries.... Honestly, I garden to be mentally relaxed and to live better at the end.

This sense of engaging the mind in a different, relaxing activity is also expressed by some community garden practitioners. The gardens in this context are perceived as places to take a break from a busy work schedule. These kinds of psychological benefits from community gardens are even more appreciated by practitioners of the younger generation who have been actively participating in community gardening in recent years.

It happens that you finish your workday. It happens sometimes when you are angry, you are frustrated. You come here and forget everything. It is like when you leave the office, you are tired. Then, you come here and meet people. You then become in a good mood. I like it... In fact, the community garden is a combination of a lot of things, and that satisfies me fully (Eco-engaged practitioner, Montreal).

The study participants spoke at length about the health benefits of UA as an environmental asset. Some UA practitioners, particularly in Parc-Extension, perceived their gardens as a green infrastructure that contributed to controlling the urban heat-island effects which are quite pronounced in their neighborhood, one of the most densely populated in Montreal. Other interviewees emphasized their satisfaction at being able to be outside and be in contact with nature. As one Eco-engaged practitioner puts it: "(...) it was an opportunity for me to have a little more contact with the outside. I think gardening also promotes mental wellness and it is an activity like any other, which is not a sport, but I like a lot (...)".

From the perspective of most of the interview participants in Montreal, except for the natural parks, the available lands in the city should be used for more urban gardens. Although the practitioners are aware of the importance of public parks, they see the gardens as a way to access their own green space. Furthermore, having access to green space is beneficial for their health and well-being. They also recognize that they are privileged to be able to access the gardens, which is why they also advocate for maintaining public parks.

In a similar sense, UA practitioners in Quito believed that UA not only improves their mental health, but also plays a key role in their physical health. At least five UA practitioners attributed improvements in their physical health to UA activities. One Econo-expert practitioner summarized this tendency by stating:

Yes, as I tell you, I was..., no I am still diabetic and high blood pressure, sometimes I screwed up a little with diabetes and pressure. But since I start gardening not so much.

The garden has improved me a lot, the diseases do not affect me badly anymore. Diabetes contains something (...), I forgot the word, when it affects you, you fall. But, now no, it seems a lie, but the garden helps me a lot (...).

The majority of UA practitioners in Quito consider the health benefits of their healthy diet to be greatly influenced by UA activities. One Versatile-caretaker practitioner pictured the health benefits she perceived from UA activities in the following way:

First of all, the good nutrition, we have recovered our health, before I used to have a stomach-ache, what they call gastritis and now in my family there is almost no more. More than anything, we are not spending on doctor visits, we improve food, we improve health, we do not spend on doctor.

Another one from family gardening mentioned:

(...) In my life, these benefits have changed me, for example, in eating healthy. They have prevented many diseases. Yes, for example in my case, although I am fat, I don't have any glucose, I don't have excess cholesterol, most importantly, I am strong, I don't have diabetes. And nobody believes me, everyone says that I am diabetic. But, two months ago, I did the last test, zero diabetes, zero glucose. (...) what can I say? It is because of the things I eat in my garden (...).

Beyond the health prevention aspects of UA activities, a therapeutic function of UA has also been observed in the neighborhoods of Quito that participated in the study. Through the CONQUITO project, some health centers have incorporated UA activities into their therapy. In the opinion of the promoters, UA in health centers can positively influence the therapy they provide to patients and can lead to new habits.

3.5.3.3 *Achieving competence: empowerment*

Empowerment as a tangible process is difficult to observe [45]. The efforts of UA promoters to encourage gardening as an empowerment initiative have yet to yield results. However, some UA practitioners in both Montreal and Quito were motivated by a desire to gain new skills and learn about gardening. Similar to practitioners in Quito, where CONQUITO has a very organized UA technical assistance program, UA practitioners in Montreal emphasized the fact that being outside provides an opportunity to learn. One Socio-engaged practitioner in Montreal said: "I want a community garden because I wanted to learn... I found it interesting to have time, to go outside, and to learn how to farm". This learning environment that UA practitioners found in a garden goes beyond a simple motivation. For certain UA practitioners, it also influences their attitude and behaviors. The following remarks illustrate how UA practitioners typically expressed the meaning of the competencies they gained from UA activities: "The garden is full of life lessons, so it makes me a better person,

I am more organized” (Socio-engaged practitioner, Montreal). “Now, with the training I received I have a basis to explain, I am already a trainer too, I trained myself, I am also a trainer to other people wherever I go” (Socio-engaged practitioner, Quito). In the following quote, a UA promotor at a health center in Quito reflects upon the changes that UA brought into the patients’ attitudes about environmental issues:

The learning process through technical assistance has brought several changes. For example, in the patients’ attitude, first, they are more conscious people. On the issue of recycling and waste management, people are more aware of what happens in their environment. Some are more aware of the issue related to water, they are more conscious in terms of the food they eat (...).

Many UA practitioners shared personal experiences of developing much of their gardening skills through the collaborative work that takes place in the gardens. “I started from scratch, because I didn’t know anything about agriculture, so what interested me was to see how tomatoes were grown” (Socio-engaged practitioner, Quito). “But I still have neighbors on the field who have good skills that I can count on, and we exchange ideas and I often apply new solutions” (Socio-engaged practitioner, Montreal).

Unlike in Quito, where few immigrants are involved in UA, in Montreal some immigrants see the gardens as a place of cultural connections and to improve their language skills. For one recent immigrant, the opportunity to learn a new language is even more important than other skills she could learn through UA. She mentioned:

I came to Montreal in 2016, so I did not know anyone here, it was an opportunity to learn French, to engage in gardening (...). Maybe sometimes, I do not understand everything that happens here. But it’s not really a problem, rather I see it as an opportunity to improve my French (...) (Socio-engaged practitioner, Montreal).

All UA practitioners in Quito have expressed their appreciation for the technical assistance program provided by CONQUITO, indicating that they have gained new knowledge about gardening from the technicians. The attitudes of community gardeners in Montreal about technical assistance was quite different, however. For example, the Econo-expert practitioners did not seem interested in external technical assistance.

3.5.4 Extrinsic motivations

3.5.4.1 *Social capital and community network motivations to engage in collective gardening*

All the UA practitioners from collective gardening in Montreal (n= 11) and in Quito (n=8) have highlighted the importance of connecting with others or forging new friendships as one of the main motivations to join the group. These practitioners see UA activities as a way to enhance social ties with their neighbors. In Quito, for example,

some UA practitioners appreciate the ability to share their food with their neighbors. Sharing with others gives them satisfaction, as one practitioner expressed when asked about the perceived benefits of UA:

I really like the fact it allows me to interact with other people, have friends, I like when we get together, work in a team and we can say that we have our organization to welcome old people, children (...). The fact I can say that I have a relationship with almost the whole neighborhood. People see me, they know me, they greet me, they say hello (Socio-engaged practitioner, Quito).

This kind of activity that forges friendships in the collective gardens bring a sense of belonging to the community. It makes people more aware of associative life and the importance of helping each other. As one Socio-engaged practitioner in Montreal stated: "it was really for me the initiation to the collective life, it made me more aware of what collective life is". For some practitioners, gardening collectively brings intergenerational integration, and it makes the gardeners feel that they are not alone in the neighborhood.

The social relationships forged through community gardening can also be somewhat ambiguous. Unlike collective gardening, where the social relationships and sense of community belonging are highly pursued by practitioners, the community gardens in Montreal reflect a more individualistic culture. Some of the UA practitioners, who initially were looking for community gardens in order to strengthen their social relationships, have opted for a collective garden. As one Socio-engaged practitioner in a collective garden in Parc-Extension said: "I wanted to have a plot in a community garden, but now, I am not interested anymore". More than half of the UA practitioners from community gardening have complained about theft and the lack of garden maintenance in other plots. Some of them criticize their neighbors for negligence and lack of cooperation. The way that these community gardens are organized promotes this kind of individualism. Each member has an individual plot, and only few gardeners participate in the limited number of integration activities that are offered. Even though most of them consider the gardens as a hobby that alleviates stress, not all of them seek social interaction. One practitioner clearly states in his interview that making friends was not his priority:

I rarely meet people here; I met my immediate neighbors once in May. I have not seen them since. My two other side neighbors, I have not seen them the whole year. I do not have so many interactions. And, it's not my goal either to come here to make friends. I greet you with courtesy, but my goal is to escape from the daily stress and to forget everything (Eco-engaged practitioner, Montreal).

Nevertheless, some collaborations exist between UA practitioners in the community gardens. For example, one researcher observed that when gardeners go on vacation during the summer in Villeray, they always ask the others to help with watering through the community garden Facebook page. Usually, people volunteer to help.

3.5.4.2 *Economic rewards as a driver of UA*

Another extrinsic motivation of the UA practitioners of this study was the expectation of economic rewards. More than half of the UA practitioners interviewed in Montreal (n= 10) and all in Quito (n=18) agreed or strongly agreed when asked if they were able to save money on food. For some practitioners, savings on food was a motivation to join a UA project. As one Eco-engaged practitioner in a community garden in Montreal stated: "I wanted a community garden because I wanted to learn and to save on the price of food". The other practitioners perceived vegetables from the garden as different from those from the supermarket. For them, their produce is better in terms of quality, and when they have a good harvest, they do not need to purchase vegetables at the supermarket. Even in Montreal, where production is not continuous throughout the year because of the weather, some UA practitioners manage to reduce the costs of vegetables in winter. One Econo-expert practitioner highlighted: "Last winter, I did not need to buy beans because we really had a huge harvest, I froze them. I did not have to buy any at the grocery store". However, not all UA practitioners in Montreal experienced the benefit of saving money on food. Some practitioners questioned if the time spent in the garden and the cost of a small plot were worth the efforts invested. This sensation also depends on the productivity of the season. As one Econo-expert practitioner from a community garden in Villeray said: "(...) Because I do not make profit out of it. I do not have a profit from what I grow. I grow for me, but it is not fair to keep increasing my expenses (...)".

In Montreal, the economic rewards of UA are limited to savings on certain types of foods such as vegetables, whereas in Quito they also include income from UA produce. On the one hand, profit is a driver of initiating UA projects for those looking for additional income sources. On the other hand, income is perceived as a benefit from the activity. Through the farmers market Bioferias, some UA practitioners in Quito are able to commercialize part of the produce from their gardens. Many of the collective gardening members interviewed in Quito agreed that they sell part of their production and with the money raised, are able to invest in more inputs and new infrastructure for their gardens. More than half of the Versatile-caretaker practitioners in the family gardening category claimed to have made money by selling surplus to neighbors.

For UA promoters in Quito, although food security has always been the ultimate goal of the UA projects, at some point they made a political decision to take an economic-empowerment approach to UA initiatives. They felt the need to develop this new approach because higher productivity or too much surplus could potentially demotivate UA practitioners. In other words, they did not want UA to be the victim of its own success.

3.5.5 Constraints and challenges faced by UA practitioners in deprived neighborhoods

While UA has many benefits that motivate practitioners, we also observed multiple constraints inherent to UA practices. Some of the constraints are structural because of the dependence on city authorities, while others are personal. Considering the small-scale of this activity, UA projects usually receive positive support from the

population and local authorities in both Montreal and Quito. There have been cases, however, of local communities opposing UA gardens for aesthetic reasons, among others. For example, one collective gardening participant in Parc-Extension mentioned a situation where they were forced to close a garden due to the complaints of neighbors. Practitioners in both cities faced other constraints related to land, theft, and crop management, as well as the challenges of community life in the community gardens, including lack of plot maintenance by neighbors, and non-compliance with internal rules. Other issues such as soil contamination or food safety, which are often mentioned in the literature as factors that hinder UA, were not perceived as major constraints in our study.

Collective gardening participants in Montreal felt more pressure regarding access to land than community gardening participants. Most of the collective gardens are built on private land and the practitioners are at risk of being evicted from the land by the owners. As one Socio-engaged practitioner from collective gardening said: “We consider this garden as an ephemeral garden (French translation “Jardins éphémères”) because the owner of the land can choose to implement another project here at any time which would be very unfortunate”. In the case of community gardens, the challenge is to first find a plot, but once the plot is obtained there is greater security. Nevertheless, accessing a plot in a community garden is frustrating because of the waitlist, with some gardeners waiting up to ten years until they obtain a plot.

In contrast to restrictions on available land in Montreal, land was not considered a challenge in Quito. All the family gardeners have enough space to garden in their backyard. The collective gardening participants also have a bigger piece of land that sometimes belongs to one of the participants or to an institution, such as the municipality, a church, a school, or a hospital. In some cases, they rent the land from a neighbor. UA practitioners in Quito are not at risk of being evicted from their land.

Among the other constraints that differentiate the two cities, theft was identified as a noticeable concern in community gardening in Montreal. More than half of the community gardeners interviewed complained about theft that occurred in the gardens. In contrast, the collective gardeners not only did not complain about theft but enthused that their gardens were monitored by neighbors who prevented strangers from vandalizing their plots. Community gardeners in Montreal have also complained more about a lack of cooperation from neighbors than collective gardeners. One Eco-engaged practitioner from a community garden has this to say: “(...) Now it's a mess, the aisles are not cleaned. Anything grows anywhere. The gardens look more like a battlefield than a garden, and nobody says anything”. These types of minor infractions can frustrate the gardeners. Instead of complaining about theft, UA practitioners from collective gardening raised concerns related to their practice, such as pest and disease control and time availability for garden maintenance.

3.6 Discussion

The purpose of the present study was to provide an empirically-grounded understanding of the characteristics and motivations of UA practitioners, as well as the challenges they face in deprived neighborhoods of two cities with different socioeconomic contexts. In Montreal, the majority of the UA practitioners were full-time employees and do UA as a secondary activity. This contrasts with the case of Quito, where UA is practiced primarily by women who have employed husbands and who use their gardens to provide healthy food for their household. This correlates with another study that provides evidence on how UA activities can encourage socio-economically disadvantaged women to adopt new dietary practices [28].

Most of the practitioners in Montreal live in households that are composed of one adult without children. In Quito, however, the typical household of a UA practitioner is composed of a couple with children. The Eco-engaged and Socio-engaged profiles predominate among practitioners in Montreal, whereas in Quito, Econo-expert and Versatile-caretaker practitioners are more common (Fig. 3-4). That can be explained by the fact that UA in Montreal is more a personal choice to satisfy oneself and stay connected with the environment and community (relatedness). On the other hand, in Quito it is more related to a family caretaking dynamic, people practice UA to feed themselves and their family (self-control, economic rewards).

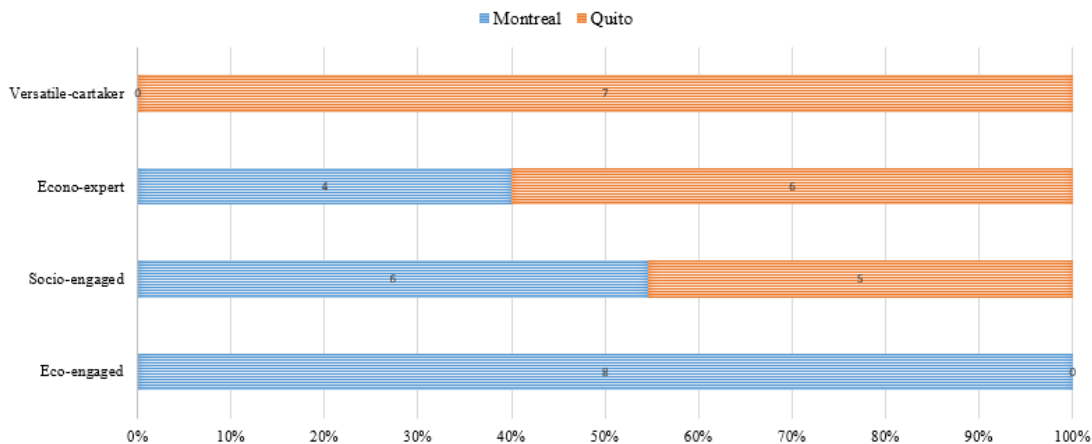


Figure 3-4 Distribution of UA practitioners by city

Our study finds substantial differences between the two cities in terms of the extrinsic motivations for practicing UA. In the neighborhoods studied in Montreal, practitioners did not see UA as an income-generating activity, whereas in Quito, many practitioners viewed their gardening activities as an additional source of income. In Montreal, UA practitioners were most likely to see the social relatedness of UA as a reward from their engagement in collective gardening. Yet in Quito, social capital does not seem to be a driver of engagement in UA activities. For instance, practitioners in Quito seem to be more motivated by self-control and economic reward

dimensions of the SDT. We did find some similarities in terms of those factors that intrinsically motivate the practitioners. In both cities, for example, UA is appreciated for its food production function. This is consistent with prior research that showed access to food is an important aspect of UA activities, even in high-income countries [19]. In family gardening in Quito, as well as in the community gardens of Montreal, many practitioners prioritized productivity over social capital. This pattern was particularly common among immigrants in Montreal who had previously worked in agriculture and who were interested in cultivating crops specific to their cultural heritage. Other researchers have already pointed out how immigrants can recreate the landscape of urban community gardens with their traditional crops [46, 47].

With respect to intrinsic motivations for engaging in UA, mental health and well-being seem to be more relevant in Montreal than in Quito. Some practitioners in Montreal see the gardens as a space to escape from the daily stress of their workplace. This is consistent with findings from other scholars that describe urban gardens as a relaxing refuge from daily pressures, as well as a source of social support [20, 48]. This also concurs with the self-control dimension of the SDT. Furthermore, UA practitioners in Montreal were not particularly motivated by the influence of gardening activities on their physical health, which contrasts with the case of Quito.

Almost none of the Montreal practitioners pointed to physical activity as a motivation to engage in UA. This is consistent with another study [49] which found that exercise was not a primary motivation for working in community gardens. Other studies do indicate, however, that physical activity, or a reduction in sedentary behavior, was one of the perceived benefits of getting involved in community or home gardening in other high-income city contexts [50, 51].

Our findings also show that economic empowerment can be a salient motive to keep people engaged in UA projects in middle-income countries. When production exceeds consumption, UA practitioners should have an outlet to share or sell the surplus. Our study found that UA practitioners in Quito typically share their produce with neighbors, and yet after doing so they still may have a surplus. The lack of options to sell the excess production could be demotivating. For this reason, CONQUITO provides a place to sell surplus produce through farmer markets. Indeed, the lack of knowledge of post-harvest management of produce or the unavailability of markets to sell surplus could be a hinderance for UA practitioners in middle-income countries, as Sethy et al. [52] found in the context of kitchen gardening in India.

Our study's findings about intrinsic and extrinsic motivations suggest that UA provides healthy food, positively influences mental and physical health, enhances social capital, and provides economic rewards to UA practitioners in deprived neighborhoods. These findings add to previous research on the multiple health-related benefits associated with UA [53-57]. However, we observed that the interviewed participants paid minimal attention to the health risks associated with UA. In neither Montreal nor Quito did interviewees provide much

information about the adverse impacts of UA on health. Concerns related to food safety were not considered barriers for UA development in the neighborhoods studied. Previous research has examined issues related to the contamination of produce grown in contaminated urban soil [58] or how wastewater from UA activities can expose certain groups to pathogenic agents [59]. With increasing urbanization, it is important for planners to take community and public health issues into account, as well the benefits of green space in planning projects in deprived neighborhoods in cities worldwide [60]. The motivations described in this study suggest that UA could support health prevention and well-being intervention. Therefore, it may be worthwhile to consider how UA can be implemented as a public health intervention aimed at reducing health inequities among vulnerable groups, such as low-income families, children, and the elderly.

Access to land was another major issue identified by interviewees in Montreal. Considering that waitlists for community gardens can reach ten years in some cases, it is important for city authorities to identify where community gardens are in high demand and refer interested citizens to collective gardening groups. It is also essential to identify available land and provide access to organized groups interested in collective gardening. Municipalities may be more effective at orienting citizens who aspire to get involved in UA initiatives by considering the different intrinsic and extrinsic motivations of our four types of UA practitioners. For example, an individual who seeks to build friendships and have social interactions would be more comfortable with the collective gardening dynamic than with the individualist approach of community gardening. Our findings also echo those of other researchers, that collective gardens are great learning spaces [61, 62].

A major strength of our research lies in the diversity of actors interviewed and the range of UA practices studied, including collective, family, and community gardening. As suggested in this discussion section, it offers a broad overview of why residents in these neighborhoods are engaged in UA. Using qualitative methods, we were able to develop a typology of UA practitioners and provide insights regarding similarities and differences between the two cities in order to encourage UA in deprived neighborhoods, beyond the socioeconomic context at the national-level. However, a few limitations should be considered when interpreting the findings. Due to time and resource constraints, we only conducted the interviews once, limiting our understanding of how the motivations of UA practitioners persisted or changed over time. We also relied on local organizations to identify our research participants. Individuals affiliated with a group might have been more likely to have positive opinions of UA activities than those who did not participate. To limit this bias inherent in our selection criteria, we have restricted generalization to the local contexts, as suggested by Robinson [43].

There are several directions that future research on motivations for UA can take. For example, assessing the opinions of non-practitioners toward UA can provide insights about community dynamics that UA creates in neighborhoods. Another possible line of research involves the design of tools that can help both researchers

and city authorities measure the impact of UA and how it can more effectively drive social change in deprived neighborhoods over time. Finally, studies of the ecological benefits of UA, as indicated by some practitioners, would also contribute to the body of UA research. This research was conducted in two countries with contrasting socioeconomic status, and it found some similarities and differences in the principal motivations. We observe that the food function of UA can be relevant for UA practitioners in high-income context, and other social functions of the gardens also play a role in a lower income context. Therefore, we recommend future research to explore how socioeconomic factors influence other aspects of UA such as agricultural practices or productivity.

3.7 Conclusions

Our study provides an empirically-grounded understanding of the characteristics and motivations of UA practitioners, as well as the challenges they faced, in deprived neighborhoods of the cities of Montreal and Quito. In Montreal, UA is appreciated for its wide range of benefits for mental health and social capital, while in Quito, it is viewed as an economic-empowerment tool. One of the more salient implications of our findings highlights arguments in favor of a more holistic food governance strategy in both cities. These are pertinent for policymakers and researchers interested in understanding the types of interactions that characterize different types of UA, such as community and collective gardening. Our findings are also relevant for planners considering healthier place-making approaches in the urban planning agenda. Future research can explore the ways in which different types of interactions occur and are maintained in UA gardens over time. Our analysis also serves to inspire critical reflections on the recognition of UA as a vital tool in the urban food system. As such, we advocate for city authorities to work on legislation that facilitates access to land and that provides support for UA. By using the SDT to create a typology and contrast the characteristics and motivations of individuals practicing UA we also provide insights for city planners, and health professionals to better orientate city authorities on public health interventions that integrate intersectoral perspectives.

The four types of UA practitioners we identified in this study can help city authorities particularly in Montreal to better support people interested in UA activities. For example, they can direct people interested in the social aspects of UA to collective gardening and keep the ones with more individual interests on community gardening. By doing so, they would reduce long waitlists in community gardening. In Quito, based on the interests of the UA practitioners, the city should continue to focus more on UA as an economic empowerment tool for the entire household instead of individual approach. In addition, the typology can be a powerful tool for people who promote UA as a food security intervention in deprived neighborhoods.

The UA movement that we observed in the neighborhoods of Quito seemed to be part of a wider urban food policy initiative. CONQUITO, as an agency under the city authority, manages neighborhood UA initiatives. This agency was able to convince a broad and diverse group of actors in the city to create an agri-food platform and

lay the foundation for a city-region food system. In the case of Montreal, although different stakeholders have coordinated actions toward developing an integrated, urban food policy approach [63], the UA initiatives observed in Parc-Extension and Villeray seemed disconnected from these efforts. This study is an appeal for future research on inclusive forms of urban food policies and how they address the needs of urban dwellers in less privileged neighborhoods.

3.8 Highlights

We identified four types of urban agriculture (UA) practitioners.

UA in Montreal is appreciated for its benefits on mental health and social capital.

UA in Quito is regarded as an economic empowerment tool.

Community gardening in Montreal is characterized by an individualistic culture.

There is a need to understand interactions created through UA activities over time.

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Chapitre 4 — Rôle de l'AU dans la transformation des espaces en milieu de vie: Étude de cas dans deux quartiers défavorisés en Haïti

4.1 Résumé

Les résultats du troisième chapitre ont révélé que les pratiquants de l'AU observés dans les quartiers moins favorisés de Montréal et Quito perçoivent un ensemble de bénéfices intrinsèques (fierté dans l'autoproduction alimentaire, amélioration de la santé mentale et physique, renforcement de capacités) et extrinsèques (revenus, épargnes sur les dépenses alimentaires, capital social) associés à leur pratique. Par conséquent, l'AU nous apparaît être une activité ayant un fort potentiel pour générer des changements durables dans les quartiers défavorisés. Ces changements peuvent être physiques, avec notamment une meilleure utilisation des espaces vacants/friches industrielles, ou sociaux, en tissant des liens entre les pratiquants.

Dans ce dernier chapitre, l'objectif est d'examiner si l'AU observées dans les quartiers défavorisés de Port-au-Prince (Haïti) répond aux principes de transformation des espaces urbains détériorés. Nous nous sommes particulièrement intéressés aux travaux et outils associés à ce qu'il est convenu d'appeler le *place-making*, soit une approche de transformation de l'espace urbain, que nous avons utilisée pour observer les processus de transformation de l'espace en cours dans les jardins de Port-au-Prince. En utilisant cette perspective, nous avons exploré comment des projets d'agriculture urbaine implantés en contextes défavorisés pouvaient, correspondre aux principes de mise en œuvre d'approches urbanistiques favorisant la construction d'actions collectives, ainsi que les retombées sociales et culturelles, même si l'objectif de ces projets ne visait pas directement ces retombées.

Pour ce faire, une étude qualitative a été menée. Elle cherchait à comprendre les caractéristiques de l'AU de deux quartiers défavorisés, à savoir Martissant et Cité Soleil. Comment les projets d'AU dans ces quartiers permettent-ils d'observer la mise en œuvre des principes de transformation de l'espace? Comment de tels programmes d'AU créent-ils des expériences significatives pour leurs participants? Entre juillet et août 2019, des entretiens semi-dirigés ont été menés auprès de participants de deux programmes d'AU mis en œuvre par deux organismes locaux FOKAL et SAKALA respectivement à Martissant et Cité soleil (n=19). De ces participants, 16 étaient bénéficiaires directs des programmes d'AU, et trois étaient des employés des organismes. Le guide d'entretien comprenait des questions ouvertes sur les intérêts et les motivations des participants, les bénéfices perçus, les expériences vécues, les obstacles rencontrés dans les activités d'AU. Les entretiens ont été transcrits en verbatim et ensuite codés à l'aide du logiciel Nvivo. La narration des codes et les thèmes communs qui ont émergé ont été analysés à travers un processus réflexif et interprétatif suivant les

onze principes du cadre conceptuel du « place-making » tel qu'il est présenté dans les articles scientifiques et dans la littérature grise.

Les résultats suggèrent que l'AU qu'on observe dans les deux quartiers défavorisés étudiés à Port-Au-Prince va au-delà d'une approche simpliste de réponse aux besoins matériels. Elle est plutôt valorisée comme un moyen de transformer les espaces défavorisés en milieu de vie et de valoriser les activités qui s'y passent. Bien que les programmes d'AU sont rarement planifiés avec ces principes de *place-making* et de transformation physique ou sociale des quartiers, ils déclenchent des transformations similaires à celles qui sont visées par ces approches et observées là où elles sont mises en œuvre. À Port-au-Prince, cela est attribuable au fait que ces projets d'AU favorisent un sentiment d'appartenance à la communauté et ils forment une nouvelle image qu'ont les participants de leurs quartiers. Les résultats sont utiles pour les planificateurs urbains intéressés à utiliser la créativité locale comme outil de revitalisation des quartiers défavorisés. Des recherches plus poussées pourraient explorer la dynamique à long terme des espaces transformés pour évaluer leur durabilité et leurs formes de gouvernance

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Role of urban agriculture in the space-to-place transformation: Case study in two deprived neighborhoods, Haiti

Pierre Paul Audate^{1,2,3} MSc; Geneviève Cloutier¹ PhD; Alexandre Lebel^{1,2,3} PhD

¹ Graduate School of Land Management and Urban Planning, Laval University, Québec, QC, Canada

² Centre for Research on Planning and Development (CRAD), Laval University, Québec, G1V 0A6, Canada

³ Evaluation Platform on Obesity Prevention, Quebec Heart and Lung Institute, Québec, QC, Canada

Corresponding Author:

Pierre Paul Audate, MSc

Graduate School of Land Management and Urban Planning

Laval University

Pavillon Félix-Antoine-Savard, bureau FAS-1616

2325, allée des Bibliothèques Université Laval

Québec, QC,

4.2 Abstract

While environmental and health preoccupations are growing, urban agriculture (UA) is becoming a key element in the future planning decisions of many cities worldwide. Beyond its well-documented environmental and socio-economic benefits, this phenomenon is being individually and/or collectively experimented with as a means of transforming urban space into place (place-making) in both high-and low-income countries. Research wise, UA can lead to the questioning of official planning visions and principles. As such, this empirically grounded study aims to question the characteristics of UA in deprived neighborhoods of Port-au-Prince (Haiti) as fields for observing space-to-place transformations. It analyzes how UA programs create meaningful experiences for their participants. The findings are discussed in relation to place-making principles and suggest that UA goes beyond a simplistic approach of responding to material needs. In other words, UA is valued as a means of transforming spaces. Although UA programs are at risk of being co-opted, they trigger transformations by fostering a sense of place, community belonging, and re-imagining of the studied neighborhoods. The findings are useful for urban planners interested in utilizing local creativity to reshape deprived neighborhoods. On a wider level, further research should report on the long-term dynamics of the transformed spaces to evaluate their sustainability and forms of governance.

4.3 Introduction

The role of food production in improving quality of life and aesthetics in cities is set to become a key factor in future planning decisions of urban landscapes. A striking example of this is the emergence of the 'edible cities' concept, which is being increasingly adopted owing to its socio-spatial and socio-ecological contributions to modern cities worldwide [1]. These contributions could not have been recognized without the identification of three interrelated and interdependent pathways (ecological, social, and individual) from which urban agriculture (UA) emerged in cities irrespective of socio-economic contexts [2]. Ecologically, the need to sustain a circular urban metabolism through the recycling of resources has given rise to different types of agricultural practices, such as composting and reuse of wastewater in cities [3]. Recent studies have been particularly useful in exploring the benefits of compost in UA activities [4]. Sociologically, the critical attitude of some urban residents toward the conventional food system has encouraged the appropriation of urban land to produce food [2, 5]. One concrete example of this is the emergence of food justice movements in relation to UA, notably in high-income countries [6, 7]. The Malthusian⁴ approach to food supply, particularly in low-income countries, is also a vital social factor in the rise of UA [6]. Additionally, for individuals, the need for green spaces in cities, the desire for knowledge on the origins of food products, and other lifestyle politics-related factors like vegetarianism contribute to the adoption of UA [2].

The UA phenomenon constitutes an analytical prism to observe the moving frontier between urban settings and agriculture, between people and the environment and between traditions and new values or identities [8]. In this sense, UA can also be individually and/or collectively experimented with as a right to produce or transform urban space into place also referred to as "place-making" [9]. Space is defined as a physical or social setting and place is space that has a meaning [10, 11]. The two notions are embedded, since space politically and socially frames the lived experience that place constitutes. Space is rather a location, while place is generally associated to a context [12]. For example, Mares and Peña [13] used urban farms in the United States (US) to discuss how city spaces are continuously reinvented as places. They underline how agricultural activities offer grounds to foster new identities and deepen social ties. UA offers an entry point to understand the process through which social and collective practices have the power to transform a specific gardening site into something meaningful. However, until proven otherwise, this relationship of mutual complementarity between UA and place-making has yet to reach its full potential in the planning agendas [14].

Several researchers have explored the role of UA in the physical and social transformation of urban spaces [15-17]. As Pudup [18] recognized, UA not only transforms people and places but is also a powerful tool in changing people's experiences of the spaces they inhabit. For Eizenberg [19], who studied community gardens in New

⁴ A theory that sustained exponential population growth will always outrun the food supply.

York City, UA as an activity is not restricted to the physical occupation of space: it may also encompass its representation and lived experiences.

This transformation of spaces into places is also experienced in deprived neighborhoods. For example, Milbourne [20] used case studies of 18 community gardens to demonstrate how UA practices were translated into new forms of sociability and public participation in several deprived neighborhoods in the UK. In other Northern Hemisphere contexts, such as in the US, UA has been an effective means of revitalizing space in deprived neighborhoods affected by antisocial behavior and violence [21, 22].

By contrast, critical explorations of UA have underscored how well-intentioned projects can have adverse effects. Gardens and gardening, particularly in the Global North, are often associated with idealized representations of human reconnection with nature, and thus questions regarding urban and spatial justice as well as the associated political and economic regimes are often eschewed [23-25]. If UA may be a learning experience that facilitates the reassertion of one's connection to the natural, social, and political environment [26]. Pitt [27] stresses that community gardening practices do not necessarily foster better care or consideration of nonhumans by humans.

Moreover, because it relies on urban dwellers to provide basic resources for themselves, UA has been highlighted as a tool of neoliberal appropriation and reproduction that increases the burdens borne by individuals and diminishes collective agency [18, 28-31]. Furthermore, UA requires land or access to land in the Global North as well as in the Global South. While spaces such as community or collective gardens can facilitate such access, in cities where food alternative initiatives are ubiquitous and “trendy” such spaces can also exacerbate spatial and social exclusion [5, 32].

Notwithstanding, gardening with other people offers opportunities to share insight about local concerns and to envision new representations of the cities [33]. Barron [34] also underscores how the space provided by community gardens may transform groups into communities that work as counter-forces to the privatization of space. In that sense, UA has the potential to empower people to reclaim and transform cities' open spaces into meaningful places [35, 36]. More broadly, community gardens can be tools to achieve social justice in the cities [37, 38]. Mares and Peña [13] argue that through conscious place-making rooted in a sense of cultural heritage, UA could be a collective expression of a community's political power in the contested spaces of cities. For example, they highlighted how immigrant groups were pivotal sources of resistance to the enclosure and privatization for development projects of an UA land in Los Angeles in 2006.

For Karge [16], the nature of some UA activities positions them within the place-making narrative, although they are rarely planned using place-making tools. Despite the extensive research on space and place, UA's role in

the transformation of neighborhoods, notably deprived ones, located in the Southern Hemisphere remains underexplored [9, 39]. Meanwhile, the productivity aspects of UA, as a food and nutrition security outcome in low- and middle-income countries, has been studied extensively [6, 40, 41]. This Southern paradigm of focusing UA studies on productivity with limited exploration of the socio-spatial aspects may be explained by the fact that most UA projects in the Southern Hemisphere are driven by non-governmental organizations (NGOs) with development approach agendas [41, 42].

Moreover, unlike other cities in the Southern Hemisphere where research on UA has been explored in relation to its contribution to food and nutrition, scientific research on UA in Port-au-Prince is scarce despite ongoing interest in UA in various deprived neighborhoods in Port-au-Prince [40]. However, greater concerns over food security, food safety, and spatial planning anomalies in Port-au-Prince would likely obscure the socio and environmental contributions of UA to deprived neighborhoods [43, 44]. The main question that this study addresses is twofold: (i) can UA programs in the deprived neighborhoods of Port-au-Prince offer opportunities to observe space-to-place transformations principles? and (ii) what meanings do the participants attach to UA in deprived neighborhoods? As far as UA scientific research goes, these questions have hitherto been neglected.

This empirically grounded study contributes to the global debate on place-making and UA, adding a perspective that is informed by practice and theory from a low-income country [6, 41]. The article is organized into four parts. First, we present key elements from the literature on the concept of place-making. Second, we situate the notion of UA within the place-making conceptual framework. Third, the context of the empirical case studies is presented. Finally, the cases are analyzed and discussed in relation to the place-making principles to assess the relationship between place-making and UA.

4.4 The conceptual framework: Place-making

Although many studies have already sought to address the relationship between space and place, academic debate continues to surround the relationship between the two concepts [10, 45, 46]. For some authors, space and place are interchangeable [47]; for others, they are slightly related but different [11, 48]. For instance, place is understood broadly as a space that people are attached to or as a 'meaningful location' [10:7]. Noori et al. [11] use the following metaphor to explain the concept: "space is about having an address and place is about living at that address" (p. 317).

Massey and Jess [45] maintain that place is a social construct because the meaning and identities of places are multiple. They are often contested and reinvented through time [49]. Place is experienced and sometimes transformed by people through dynamic processes [47]. These processes may occur in the everyday life but also take place on a larger scale through the (re)definition of urban spaces which is often characterized by

conflicts and tensions between ecological and socio-cultural issues [50]. In that regard, place also encompasses the cultural relation of humans with the natural environment [51], which makes it difficult to assess and simplify.

The idea of ecosystem services has been valued and operationalized by planners and policymakers in order to put into perspective the regulating, economic and cultural benefits of ecosystems for humans [52, 53]. But from a critical perspective, the ecosystem services concept reduces spaces to commodities [54, 55]. Also, this approach tends to overlook how context and individual needs influence ecosystems contributions to well-being and to improving living conditions [56]. To that extent, place-making rather addresses the dynamic process through which material and immaterial dimensions combine to influence the shaping of spaces and of a sense of community.

Scholars seem to agree that the term ‘place-making’ (or ‘placemaking’) has its origins in two well-known theoretical urban planning works: that of Henri Lefebvre (1901–1991) on citizens’ rights to the city, which embraces the social production of urban space, and that of Jane Jacobs (1916–2006) on city planning that is centered around people and community [9, 57]. From this perspective, the notion of place-making transcends the design rhetoric of urban planning to embrace people and community. Bendt et al. [26] approach place-making as a process that improves physical spaces and local communities through participation. Furthermore, place-making has been invoked to challenge the narrative around the eviction of local populations for the benefit of development projects in deprived areas [58].

The term ‘place-making’ has attracted attention in urban design for several years [59, 60]. Recently, the non-profit Project for Public Spaces (PPS) has proposed place-making as a practical tool for (re)-creating public spaces and transforming them into vibrant communities. The approach centers on four key elements—(1) sociability, (2) uses and activities, (3) comfort and image, and (4) access and linkages [61:21]—and eleven principles that contribute to the creation of “great” places. Karge [16] classifies the eleven principles into four broad topics: (1) community network and vision, (2) function and design, (3) iterative development, and (4) dealing with obstacles.

However, place-making as an analytical approach does not fully lead to an understanding of what Lombard [58] recognizes as the complexities of power in place, which can be problematic in the long term because different groups may assign different meanings to space and place. The approach has occasionally been critically described as a means of validating the withdrawal of public authorities or disinvestment in deprived neighborhoods [62]. Among the questions that we should ask are: how does place-making create divergences in the meaning of place?

Although commonly labeled as unsafe, dangerous, and as overcrowded environments with no means of solving their own socio-economic problems [63], deprived neighborhoods—even in low-income countries—can forge identities through place-making [58]. However, research on place-making applied to deprivation contexts, particularly in the Southern Hemisphere, has rarely interrogated the meaning of place. A focus on place-making is recommended as a means of better exploring lived experiences and the sense of place experienced by urban dwellers in deprived neighborhoods. In the present study, we use UA as interventions to explore space-to-place transformations.

4.4.1 Place-making and urban agriculture

Although several studies have considered food as an integral part of the production of place in cities [64], the full value of the land intended for UA use is often misunderstood or underestimated in relation to its value for development [13:253]. In some cases, spaces dedicated to UA have been interpreted as sites in which conflicts between public and private land use emerged [65]. UA is sometimes interpreted as a compensatory use of undesirable and vacant lots. Greening initiatives and community gardens are also considered to be a creative response on the part of urban dwellers to the lack of public funding or disinvestment in urban services in times of austerity [16, 66].

Beyond its contribution to the physical aspects of urban space, UA also influences the appearance and meaning of places in urban areas by influencing social and environmental dimensions [67]. Some authors, particularly Eizenberg [19], Eizenberg [68] and Follmann and Viehoff [65] go further to analyze the role of UA as a socio-spatial instrument to promote urban justice and consider the phenomenon as a manifestation of “urban commons”. In the same vein, Wesener et al. [35] stress that community gardens serve as valuable platforms on which space-to-place transformation can occur. Studying the barriers to and enablers of the development of community gardens in relation to place-making principles, the authors underscore how the supported practice of community gardening with trusted individuals can contribute to the collective construction of meaning. Noori et al. [11] see allotments (spaces of UA activity) as places in which the processes of place-making evolve, as they are experienced and practiced through the attributes of identity, a sense of place and belonging, and landscape imagination. Strunk and Richardson [38] argue that UA can create more inclusive places that reflect cultural identities through visual effects that reflect the participants’ cultures. Nevertheless, UA can also create places in which tensions arise between the participants, particularly regarding their interpretations of the place’s meaning [17, 69].

Although scholars have sought to document UA as a place-making practice [16, 34, 47], exploration of the practice as a means of renegotiating the meaning and experience of space, particularly in the Southern Hemisphere, has been limited [9, 39, 41]. In the context of our case studies, we consider UA to be an important

tool in the re-creation of neighborhoods and their images in low-income countries [67]. Therefore, we invoke the sense of place, community belonging, and image creation to discuss how place-making is achieved through UA in Port-au-Prince's deprived neighborhoods. Similar to Dunlap et al. [70], who used a social constructivist approach in Texas and highlighted how UA activities shaped participants' perceptions of place through connection to the gardens' plots and the community, we aim to understand how individuals and organizations can create openings for new meanings of spaces and places including their eventual circulation among the society of Port-au-Prince.

4.5 Context and methods

Situated in the middle of the Caribbean Sea between Cuba and the Dominican Republic, Haiti is one of the three most populated countries in the Caribbean, with a population of approximately 12 million inhabitants. Its capital city, Port-au-Prince, is one of the region's most populous cities. The growth of the city's population since the 1980s has led to unplanned urbanization with increasing numbers of people living in neighborhoods with limited access to basic services. Martissant and Cité Soleil are two of the most deprived urban neighborhoods within the city. These neighborhoods are characterized by dense population, low-income households, lack of public open space, anarchic constructions in the form of small concrete buildings, land degradation, criminality, and inadequate public services [71, 72].

Martissant is the third communal section of Port-au-Prince with a large urban and peri-urban area (36.04 km²) and is located on the south side of the city. According to the Haitian Institute of Statistics and Informatics' (IHSI) estimations in 2015, Martissant had approximately 295,000 inhabitants. In the past, Martissant was known as an attractive touristic neighborhood, particularly for its green and wooded hotel properties formerly known as "Habitation Leclerc". This area once hosted celebrities and international events when Haiti was known for its touristic industry in the 1970s. However, unplanned urbanization, poverty, and the absence of basic public services have caused Martissant's deterioration into deprivation. Since 2007, FOKAL (Fondasyon Konesans ak Libète — a civil society organization in Haiti) has been working toward the creation and management of an urban park in the Martissant area (Fig 4-1.). This Park aims to create a convivial urban area that satisfies the local population's needs [71]. The 17-hectare park was initiated with a decree issued by the then-President of Haiti, which declared it as state-owned property. That act provided a legal framework for FOKAL to create and restore the unique urban green space in Martissant, which was vulnerable to the consequences of increasing urbanization. As an organization that promotes culture, arts, and literature, FOKAL has transformed this unique green space into a multi-purpose park. Inside the park are a collective garden, a memorial, a botanical garden, and a cultural center with a library and amphitheater. All cultural activities and infrastructure in the park are open to different population groups (children, youth, and adults) in Martissant (Fig 4-2.).



Figure 4-1 Location of the urban park in Martissant, Port-Au-Prince
Source: FOKAL, 2021 <https://www.parcdemartissant.org/>



Figure 4-2 The FOKAL urban park in Martissant, Port-Au-Prince
Source, FOKAL, 2019

Like Martissant, Cité Soleil is a densely populated neighborhood in the north of Port-au-Prince with an area of 21.8 km² and approximately 300,000 inhabitants. This neighborhood is well known for its past gang violence and political turmoil [72]. Cité Soleil was an industrial area during the 1990s thanks to its strategic location close to the main port of Port-au-Prince and its commercial activities. Today, many factories are still operating in the surrounding areas. However, the violence that followed the 2004–2005 political turmoil forced many industries in Cité Soleil to abandon their activities, which has given rise to vacant lots in the neighborhood. The disused spaces associated with abandoned industrial land enabled gang violence in the neighborhood [72]. For over a decade, various armed groups in Cité Soleil have been engaged in continual violence that converted the area into a dangerous place. In response to this chaotic situation, SAKALA (Sant Kominotè Altènatif Ak Lapè — a youth-led grassroots organization) was created in 2004 to promote peace between rival groups in Cité Soleil through soccer games. The organization later expanded its peacebuilding program into educational and livelihood activities. Today, SAKALA serves more than 250 members (children and youth) from Cité Soleil in sport and educational activities, such as soccer, computer literacy, and entrepreneurship. It also provides scholarships and healthcare services for the neighborhood's residents. Moreover, the organization obtained authorization from a Haitian entrepreneur to use an abandoned industrial site converted to landfill for UA activities. SAKALA has since transformed the landfill into a collective garden site to provide educational experiences for Cité Soleil's youth through a UA program called Jaden Tap Tap (Fig. 4-3).



Figure 4-3 Location of the collective gardening site in Cité Soleil
Source: Google Maps

This research draws on two cases—FOKAL and SAKALA—that were studied in Martissant and Cité Soleil, respectively. The two neighborhoods were selected as broadly representative of low-income, poorly planned, and marginalized neighborhoods in Port-au-Prince. The presence of organizations running UA programs for several years was another criterion that informed the neighborhood's selection. The data were gathered through semi-structured interviews (n=19) conducted during the summer of 2019 with key informants (n=3 employees and n=16 UA program participants) from the two studied organizations. We met with respondents in Martissant (n=12) and with respondents in Cité Soleil (n=7). The characteristics of the UA program's participants are presented in Table 4-1. All interviews were conducted with approval from a multidisciplinary research ethics board (REB #2018-157). They included open-ended questions regarding the participants' interests and motivations, perceived benefits, lived experiences, resources, and barriers encountered in UA activities, and the participants' relationships with one another, with the organizations, and with their neighborhoods. Verbatim transcriptions of the interviews were coded through NVivo. The narration of the codes was then analyzed through a reflexive and interpretative process. Finally, common themes emerged across the analysis and were situated along with participants' quotes within a broader place-making approach.

Tableau 4-1 Characteristics of the UA programs participants (n=16)

N= 16	n	%
Age		
18-45	7	43.7
46-65	8	50.0
>65	1	6.3
Gender		
Men	5	31.3
Women	11	68.7
Education level		
None	3	18.7
Primary	6	37.5
Secondary	4	25.0
Professional	2	12.5
Undergraduate	1	6.3
Employment		
Unemployed	6	37.5
Employed	1	6.3
Independent worker	6	37.5
Student	3	18.7
Monthly income		
<\$100 USD	8	50.0
\$101 – 500 USD	8	50.0
Household structure		
1 adult with children	10	62.5
1 adult without children	0	0.0
Couple with children	6	37.5
Couple without children	0	0.0
Area of origin		
Rural	5	31.3
Peri-urban	0	0.0
Urban	11	68.7

4.6 Results of the case studies

In this section, we present the findings from the two case studies in relation to the place-making principles as suggested by Karge [16] to illustrate some practical components of place-making in the deprived neighborhoods studied (5.1). We organized the results in accordance with Karge's classification of the eleven principles of place-making into four main topics: (1) community network and vision, (2) function and design, (3) iterative development, and (4) dealing with obstacles. Second, our data analysis is situated within theoretical argumentation on the role of UA in relation to place-making: (a) sense of place (5.2), (b) sense of community

(5.3), and (c) landscape re-imaging (5.4) [11]. More specifically, we explore how UA contributes to challenge the material and immaterial representations of the two neighbourhoods. We also address how this practice contributes to promote social and collective capital.

4.6.1 UA and place-making principles in deprived neighborhoods of Port-au-Prince

4.6.1.1 *Community network and vision*

“The community is the expert.”

The involvement of local communities in UA initiatives has been presented as an enabling factor that encourages the participants to keep engaging in UA activities [35]. In both UA programs studied in Martissant and Cité Soleil, the principle “the community is the expert” is fundamental and has been integrated from the beginning in operations led by FOKAL and SAKALA to ensure the success of the organizations’ activities. Neighborhood residents play an important role in fostering the meaning of UA activities for FOKAL and SAKALA. Many residents are involved in planning the gardens: for example, they are invited to collectively decide which plants they want to grow in the garden sites. Many respondents are proud to highlight their involvement in their respective gardens since the UA programs’ initiation. This underlines how UA activities may offer experiences which are not limited to the physical occupation of space. Besides offering them the opportunity to learn about UA and to experiment how and what to grow, this involvement also gives them the opportunity to learn from others, as one participant stated,

The UA program was created with us in “Talking Space”. When we started participating as volunteers in “Talking Space,” we found other people to create a core group and start talking about gardening. We learned how to make a nursery, how to plant; I have since strengthened my knowledge of agriculture (FP_03).

In that sense, the gardens’ experimental nature seems to have supported strong ties between gardeners. However, the absence of external support and expertise can be a limiting factor that may hinder the development of UA activities. This was the case in Port-au-Prince, where the lack of expertise among residents and organizers prevented them from creating a garden that fully satisfied the participants. As a FOKAL employee in Martissant said: “Given that we did not have the expertise, it took a while before we came up with something like this [the garden]” (FE_1). In this context, it may also be helpful to seek external technical support even though the organizations plan to design something that responds to the community vision. This aligns with another important principle of the place-making framework: the need for partners.

“Look for partners. You cannot do it alone”

Both organizations (FOKAL and SAKALA) have developed a network with international and national stakeholders that contribute to the development of their activities in Martissant and Cité Soleil. In the case of FOKAL, they have worked with different funding agencies, such as the French Agency for Development (AFD) and the European Union. In Cité Soleil, SAKALA has already collaborated with several NGOs, such as the Catholic Relief Services, World Water Mission, Mercy Corps, Bochika, and several other religious groups from the US. Collaborations with these actors symbolize the widespread expansion of relations through networks external to the neighborhoods. Furthermore, most of these actors contribute financial and/or logistic support to the organizations' interventions. This support, which includes accountability, is essential to sustaining the different activities that organizations carry out in the neighborhoods, including UA. Additionally, in both cases, the land acquisition processes were facilitated by political connections. For example, FOKAL's president was prime minister of Haiti from 2008 to 2009, which accelerated the presidential decree that converted the land into state-owned property. SAKALA was supported by the municipality that provided the authorization necessary to convert the landfill into garden. Another partnership model that has been implemented by the organizations is the inclusion of small local associations within the neighborhoods. Both organizations conducted several meetings with small associations within the neighborhoods prior to the projects' initiation. This strengthened their actions and gave them the confidence to operate safely within a community where violence tends to occur. One of the SAKALA employees mentioned,

Everything that we consider as an extra or surplus for us, we share with other people in the community. There are also other by-products that we sell to them when we have the opportunity. This kind of action makes the entire community happy with our actions, and they protect us. (SE_1)

Facilitation (e.g. technical expertise, help to reach the right person to get information or support, etc.) is a key factor in giving UA its empowering potential of groups and individuals

“Develop a vision.”

According to FOKAL and SAKALA employees, UA activities in Martissant and Cité Soleil are embedded in the broader vision of improving the living conditions of the participants. In this case, UA serves as a tool for realizing this vision. The strategies used by each organization are distinctive.

For the foundation FOKAL established in 2003, the primary concern is to improve democracy through an array of interactions in the public space. UA activities were inspired by discussions between participants who had been part of a waste management program. More specifically, FOKAL's participation mechanism, entitled “Talking Space”, allows residents of the Martissant neighborhood to discuss their needs and take actions in their

own community. The topic of UA emerged as a means of bringing new perspectives to the neighborhood. One employee said,

First, the motivation was the people who had already understood the dynamics of the program in the neighborhood. They have understood that waste management was good for them and for the neighborhood and that UA is part of the same dynamic of neighborhood improvement (FE_2).

In the case of SAKALA, UA is envisioned as a food-production activity but also as an alternative to antisocial behaviors in Cité Soleil. The UA project creates a different impression of a neighborhood known to be violent. It allows participants to identify with a more positive representation of their community. As one participant stated, "One of the biggest motivations is the honor and pride of having a garden in this neighborhood. As I mentioned, we have changed the spirit of arms' violence to trees" (SP_ 18).

In both cases, UA fosters different representations of individual and neighborhood identities. It opens the possibility to nurture a shared vision for the urban space. We have observed how the transformation of the space also triggers a transformation of the people, leading to a form of spatial appropriation or a sense of place.

4.6.1.2 *Function and design*

"Create a place, not a design."

The two cases studied illustrate how people have been able to appropriate misused space and transform it into something meaningful for the entire community. The garden itself becomes a mediator in the neighborhoods' social representation. Furthermore, the gardens and their products act as tools of empowerment for the participants.

In the case of Martissant, FOKAL has been able to use UA to mobilize many residents in the neighborhood for the transformation of 17 hectares of abandoned land into an urban park. Today, UA is central to the park and its image (Fig. 4-4). The creation of a park in the middle of a high-density neighborhood was challenging. However, the involvement of the community has made it possible, as one FOKAL employee explained,

Soon after the 2010 earthquake, all parts of Port-au-Prince were squatted, because of the destruction, but also because all public spaces were used to build temporary homes. Especially people from outside Martissant have tried to do the same thing with the space where we intended to build the park. The residents of the neighborhood prevented themselves and others from doing so. They said to them: "Listen here, we have our program, we are going to have our park here, you cannot build here..."



Figure 4-4 *Collective garden inside the Martissant park*

Source, FOKAL, 2019

In a similar sense, SAKALA has transformed the landfill sites of Cité Soleil into a garden to which people from different backgrounds (children, youth, and adults) can come with their own motivations. This allows people to feel that part of something bigger than a piece of land: it resembles an endeavor to inspire other communities. The cultivation of food is perceived as meaningful work in Cité Soleil. One SAKALA employee had the following to say:

...And then we said: let's turn these landfill sites into gardens. We then removed the trash. In the spirit of brotherhood, parents came, children came, other friends came, and then we turned the space into a community [collective] garden with a focus on education, to show other people that food can be made everywhere, so they can be inspired to duplicate the same initiatives at home.

The local inhabitants' active involvement in the process allowed them to shape the gardens. Representatives from both associations have left it to the participants to determine the size of the garden and the amount of effort to be invested. Participants also decide which types of plants they will prioritize. This is closely linked to a learning process: they learn about growing food but also experiment with ways to combine their own aspirations with their actions. They learn how to adapt the project to the existing conditions and to the local culture. This aligns with place-making principles and with the fact that motivations to garden in the city are diverse and heterogeneous [33, 73, 74].

For instance, in the garden of Martissant, participants gradually shifted their focus from vegetable production to growing medicinal plants to maximize the UA activities. In fact, most do not cook vegetables at home daily: they usually buy ready-to-eat (RTE) food (cooked rice, beans, corn meal, meat, etc.) at street markets. They do not

eat a lot of vegetables, which was first cultivated in large quantities. Rather, they use medicinal plants, such as jute leaves (*lalo*) or *Chamissoa altissima* (*lyann panye*). Grown as shrubs or vines, these medicinal plants are highly valued and function as a social adhesive where they are shared. More than half of the participants expressed their pride and happiness at being able to share medicinal plants with their neighbors, which is a common practice in Haiti. In this regard, the UA project offers a way to value a strong cultural heritage. Orientation of this nature also makes the gardens more functional in the eyes of the participants.

“Form support function” and “Triangulate”

The possibility for the participants—all residents in the neighborhood—to be involved in the design and decision-making for the gardens (e.g., the types of plants grown in the gardens) highlights how the functional aspects and the meaning of the place are two components of a complementary process. Gardeners benefit from the garden, learning from it and through it. In Martissant, for example, participants in the collective garden can take cuttings from the herbs and medicinal plantlets grown in the park and transplant them in their own home gardens. In Cité Soleil, SAKALA uses the garden to introduce new plants to the participants and to invite them to incorporate these easy-to-grow products into their diets. The participants planted moringa (a plant that is rich in protein), even though most of them were not aware that this plant was edible before starting the garden (Fig. 4-5).

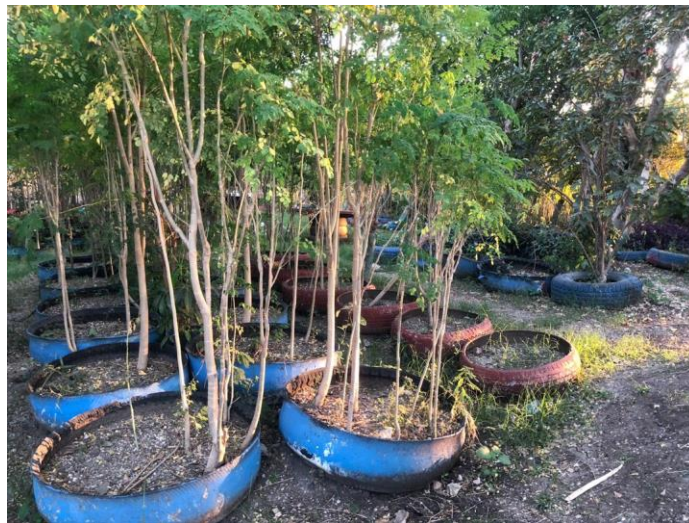


Figure 4-5 *Moringa plants in the SAKALA collective garden*

Source, SAKALA, 2019

Taking action close to their home, in their own neighborhood, and in a well-maintained location adds to the participants' sense of belonging. The garden's location in Martissant, inside the park and amid various activities, makes it attractive to users. People come to spend time in a pleasant green environment, while others take part in cultural activities or visit the memorial. In that sense, FOKAL's collective garden in Martissant is one of the

many components of a larger operation aiming at transforming the neighborhood and its reputation and making sense of the space. This set of activities contributes to transforming the park into a vibrant environment. The same can be said about the work achieved in the garden in Cité Soleil. By revealing the multiple functions of each single plant, moringa for example, the range of alternatives for the former landfill site are put into perspective. New practices offer the participants different ways of engaging with the space. As one of the participants said, “We started collective gardening because it is another way of understanding space. Put differently, space can be transformed in another way and then we come up with the gardening idea and the field looks like this [garden]” (SP_18).

SAKALA has different facilities on the same site of Cité Soleil where UA takes place. As such, it can be envisioned as an urban common in the making. Classrooms provide students with support through an after-school homework program, along with recreational infrastructures and a cafeteria. They also have a small facility to transform the on-site part of the harvested produce from the garden. For example, they take the moringa leaves to make oil, which they sell at local markets. They also use part of their harvested produce to feed the children in the cafeteria. This dynamic creates a synergy between the many programs of the SAKALA organization and contributes to transform spaces into positive significant places.

4.6.1.3 Iterative development

“Start with the petunias: lighter, quicker, cheaper”; however, “you will see a lot just by observing.”

In both cases studied, the UA activities began with waste material management. In Martissant, the waste management program functioned as an eye-opener for the participants and triggered them to discuss options, such as UA, in the “Talking Space” organized by FOKAL. In Cité Soleil, participants in the SAKALA project have turned a landfill site into a garden. The materials used in the gardens at the beginning were mostly affordable and recycled materials (e.g., tires or plastic containers) (Fig 4-6). In both initiatives, waste was also transformed into compost to incorporate into the gardens. Such activities carried out by the two organizations would surprise anyone familiar with Port-au-Prince because both Martissant and Cité Soleil are notorious for their violence and have been stigmatized accordingly. The success of the UA projects, as evidenced by the residents’ pride in participating in the gardens, is more impressive: “The greatest benefit I get is not in terms of economics, but in terms of visibility because when you say SAKALA, it’s something great, it means something real and concrete because we are like a unique community” (SP_18). The participants’ satisfaction is greater when they see the results of their efforts. They witness the transformation of the space, or as one SAKALA employee expressed,

In terms of the residents of Cité Soleil, we can say that the satisfaction is “very balanced”: people can look at the garden, and they see the results. For example, they know how the

land was before and they see how it is now; they can see the difference, and they always share the pride and honor that we feel as an organization.



Figure 4-6 Recycled materials used in the SAKALA collective garden

Source, SAKALA, 2019

“You are never finished.”

Although UA has helped to transform abandoned or neglected urban spaces into meaningful places in two deprived neighborhoods of Port-au-Prince, FOKAL and SAKALA want to do more. They see UA as an instrument in the appropriation of misused space, but they also conceive of it as a means to provide food for people. Furthermore, their approach transcends a collective action to impact individuals’ perceptions of and relationships with space and food (Fig. 4-7). One employee of SAKALA mentioned,

And now we just launched a new approach that is rooftop garden. With this approach, we want to use every imaginable and available space for food production. We are currently experimenting with several rooftops in Cité Soleil that can inspire people because even though there are many house roofs that are not appropriate for food production, and there are still plenty of rooftop spaces in Cité Soleil that can be used for food production...

In that sense, the UA activities of both SAKALA and FOKAL can be seen as a first step in fostering a greater engagement with the residents and communities of Cité Soleil and Martissant. They help foster a sense of belonging and a sense of trust, which are pre-requisites in transforming the space into a meaningful place.



Figure 4-7 Rooftop gardening in participant home inspired from SAKALA UA program

Source, SAKALA, 2019

4.6.1.4 Dealing with obstacles

“They always say it cannot be done,” but “money should not be the issue.”

Some participants were initially skeptical about the successful implementation of the UA activities for two reasons. On one hand, the site in which the gardens were started had deteriorated: as one interviewed participant in Cité Soleil said, “we could never have imagined this space would be a garden today”. On the other hand, the lack of labor has raised some concerns because UA usually requires volunteers. Asking unemployed people in a deprived neighborhood to volunteer is not an easy task, but the participants were able to engage with FOKAL and SAKALA in the programs without expectations of a salary. Since then, they have been able to move forward. As one FOKAL employee said,

Well, the big constraint, and this is for all programs, is to solicit volunteers. When you ask someone in a difficult neighborhood to do activities as volunteer, they do not want to because people often think that you have billions and millions of dollars for programs...these are observations that we made and it is extremely difficult for an organization to move forward with a UA program with people who do not have any source of income....

In the SAKALA case, the ephemeral status of the UA space emerged from the interviews as a threat to the program's long-term sustainability. The site was formerly industrial land, but the organization obtained authorization from the owner to establish the garden. Some participants are aware that if Cité Soleil regains its image and attracts new investments, they may be displaced from their current locations. This would be

unfortunate because the participants have already formed an emotional attachment to the place. This is particularly explicit when they talk about UA activities, as we discuss in the next section.

4.6.2 UA as a sense of place and the feeling of being home

The sense of place encompasses both the attachment and meanings that individuals or collectives ascribe to the physical environment [70]. While the sense of place represents a subjective perception, it translates to a conscious feeling about the physical environment [75]. In the two deprived neighborhoods we studied, the abandoned spaces carried meaning for the participants. They were described as symbols of wastelands or hotbeds of antisocial behavior (crime). The sites' physical transformation through UA activities has offered an alternative that has changed the meanings of these marginalized spaces [20]. Most of the interviewed participants strongly associated the UA activities with positive changes in their neighborhoods. This positive perception of the sites' transformations aligns with what Tidball et al. [76] emphasized as factors that lead to increased place attachment.

In both cases (FOKAL and SAKALA), one of the organizations' objectives with the UA programs was to ensure that every participant would eventually have a home-garden in which to produce food. In the case of FOKAL, all participants interviewed now have a garden at home. However, the participants still attend the collective garden on a regular basis. This is motivated by their will to prepare plantlets with other gardeners and to continue to learn about UA. They also expressed their interest in meeting and interacting with other gardener participants. All interviewed participants agreed that they visit the collective garden site at least once a week and that they enjoy spending time with others and learning from these interactions. In other words, though the participants benefited individually in terms of learning how to design a home-garden and to grow edible plants, the UA activities also helped improve their social experience and sense of community. Their frequent visits to the collective garden site strongly indicate their attachment to the place. They also bring their lived experiences in the collective garden and the benefits derived from social interactions back to the home gardens. As one participant said, "If you come into my house's backyard you will see that there are four seats in the middle of the garden because that is where we take our break. We transform it into a living room; you see the plants and trees. Everyone can sit to talk and make jokes" (FP_5). This statement clearly expresses the perception of the garden as a place that people are proud of and enjoy interacting in.

Moreover, this perception of the garden as a place clarifies that even in deprived neighborhoods in low-income countries such as Haiti, where food security is a pressing issue [43, 44], the garden's spatial and social functions can be as relevant as or even more important than its food supply function for UA practitioners. In Martissant, this aspect is particularly salient where, as already mentioned, the participants decided to replace vegetable production with medicinal plants. Lindemann [62] has made similar observations in Ohio State while studying

community-based and resident-driven UA programs. Her study found that UA efforts are not always based on food production or food consumption choices but rather on a desire to transform space. However, our findings differ slightly from arguments that have largely dominated the literature regarding UA as a food security tool in the Southern Hemisphere [6].

With its UA program, SAKALA has been able to change the participants' perceptions regarding the narrative of the Cité Soleil neighborhood, but the other residents' perceptions remain to be assessed and understood. Of course, the economic benefits from UA activities will not profoundly change the participants' living conditions. However, our findings show that the experience has shaped what other researchers have called a spirit of attachment to the lived space, which is fundamental in the place-making process [11, 77]. For some young students participating in the garden, SAKALA is a second home. They consider the other participants to be brothers and sisters. This sense of place is strongly intertwined with a sense of community for several participants, since it engages them in some form of social connection and a collaborative network [78]. But the experience may not be the same for the entire neighborhood, since tensions can arise between different views of UA participants or different perspectives on their values [69]. The area in which SAKALA operates is restricted to people who participate in the organization's activities. This means that a person who does not agree to the organization's principles and vision would not have the same attachment to the space, even though it is undergoing positive transformations. In fact, the transformation process may trigger an opposite effect by disrupting the sense of belonging that prevailed in the neighborhood before the organization worked to instill another dynamic. This is a critical argument that has been addressed to place-making, since some believe that "transformation contradicts the very essence of place-making" [77].

4.6.3 UA as sense of community and social belonging

The sense of community encompasses perceptions of mutual benefits, which create a sense of belonging and of participation in something meaningful [79]. In the context of our two cases, the sense of community—that is, the belief and value that the other members of a group matter—has arisen as a dependent factor of the sense of place, which can be defined as the conscious attachment and meanings that individuals or collectives ascribe to the physical environment [70, 75]. Once the space is transformed into a site for people to share experiences and ideas, it becomes a meaningful collective place, which is a form of urban commons [19, 47].

The participants we interviewed showed a strong attachment to the gardens, but they also expressed their social ties with the other participants. They attest to a spirit of mutual aid. The UA activities in Cité Soleil and Martissant contribute to strengthening the ties between the participants. As most of the participants affirmed, they take pride in sharing— food, medicinal plants, and information, but also a special experience and this effort to transform the neighborhood's landscape. The case studies show that people may find comfort in feeling that they belong

to a group. This does not mean that differences and individual characteristics must be smoothed out or neutralized. But it means that the garden may become a context in which they fit despite their differences.

In Martissant, respondents elucidated how the small core groups that formed at the beginning of the UA program eventually dissipated as the program evolved. In both studied cases, the sense of community developed as a result of the cooperation that took place in and for the gardens, as other authors have also mentioned (De Angelis, 2003, cited in Eizenberg [19]). This means that UA activities can function as a catalyst in the formation of close relationships between different groups. One participant from Cité Soleil commented,

Well, I think the benefit I get from the activity is my satisfaction in helping others find food to eat and familiarize myself with different kinds of people. I build a network of contacts with people that I did not know before; they come here just because of the garden now that they have access to the site. We work together as a team. I think that is the benefit that I can say I get (SP_16).

Another participant reflected on the nature of the relationships developed:

Well, I think that the relationships, they have moved from the friendship stage, they are more like brotherhood now, because SAKALA inspires us more in terms of brotherhood relationships. When you start working in the team with SAKALA, you are no longer friends, you become brother, you become sisters to us (SP_18).

As this participant describes, UA activities help to foster new representations of other residents in the neighborhood based on social ties. Over time, these new representations can also bring people into a network to give them a voice and the skills that will allow them to become influential in the public sphere [80]. In Martissant, gardeners have partially achieved this goal of impacting decision-makers by building on their connections and on the success of their experience to put pressure on the city. Previously, the local administration was afraid to offer garbage collection services in the neighborhood because of the violence. Now, the municipality sends trucks to collect household waste in the neighborhood. SAKALA's participants in Martissant used their social ties to gain confidence and to devise creative solutions. One participant further highlights this point, "Some people didn't know how to talk to any other person, ...after I started, I found all kinds of people. Regardless of their rank, I can talk to them. I came to see that everyone is human."

Critically, this implies that UA spaces are understood as capacity-building places, where individual ideas can be transformed into collective actions. In effect, these actions often express the weariness associated with the lack of public services in the area. The absence of inspiration or leadership from local authorities gives them confidence to claim control of local space. It motivates gardeners to work at creating more meaningful and

democratic community spaces [20, 78]. By contrast, earlier work has also presented community gardening as a mechanism that supports the state during periods of crisis [18].

4.6.4 Re-imagining deprived neighborhood landscapes through UA

The concept of re-imagining lies in the revitalization of the urban space to create attractive physical environments that are safe and pleasurable [81]. At the same time, these attractive environments are considered a common resource for making meaning and enhancing positive emotional experiences for both UA participants and visitors [19]. Building on this concept of re-imagining, UA activities can be analyzed as ways to influence visual representations and perceptions of the neighborhoods.

In both cases studied, the collective gardens are perceived as projects through which improvement can begin to transform the deprived neighborhoods. Although both neighborhoods are still stigmatized today by their past problems with crime, UA activities taking place in their landscapes seem to have the capacity to spur larger change, including strong symbolic changes. One interviewed participant in Cité Soleil conveyed the aesthetic reality [11] that UA activities bring to their neighborhood with the following words:

The space you are looking at here, it's a site that some criminal groups used to execute people during the political turmoil 2004–2005. During that time, if they caught someone and came here with him, you could have said you wouldn't see him again, because they would have killed him. (...) Sometimes they used tires to commit their forfeit. But once SAKALA came up with the garden idea, we used the tires to produce food instead. We said the place where they used to kill people has been transformed into places that give life because the trees provide oxygen, plants bring a lot of things that give life to people (SP_17).

In this statement, the participant clearly brings together the dramatic past and the creative and fruitful work that constitutes the place's new image. The participant interpreted the garden as a space that is both functional and full of life [11]. The garden produces food, but it is also a place in which people can use their imaginations to create innovative ways of using waste. In this case, the participants transform tires into something with a positive purpose, such as containers for growing plants. The statement also shows how UA can contribute to transforming undesirable spaces into safe and peaceful places for the youth. McCabe [21] also highlighted the effectiveness of UA in reducing urban violence among young people. Furthermore, UA can shift the narrative around stigmatized neighborhoods in which fear reigns as a barrier to safety. It has been demonstrated that place-making interventions may reduce crime and vandalism associated with green spaces [77, 82, 83], which support the idea of UA as a place-making tool.

4.7 Concluding remarks

Our first aim with this study was to explore how UA programs in deprived neighborhoods of Port-au-Prince (Haiti) can act as tools to help transform stigmatized spaces into places. Our second objective was to understand how participants of organized UA programs appreciated their experiences. Our results outlined the socio-spatial importance of UA in relation to place-making practice and theory in the context of a low-income country. We conclude that implementing UA programs in deprived areas with only a simplistic view toward meeting food or nutrition needs may not be the most effective approach. The practice of UA was not always driven by material needs, but rather the manifestation of an urban social interaction [23, 28].

The gardens of Martissant and Cité Soleil did provide spaces to grow edible plants, but mostly they open a new realm of possibilities for the inhabitants. The gardens proved it possible to associate a positive experience with the neighbourhoods. The connection participants developed with other participants and with natural elements can foster technical and social learning. It can also contribute to the development of the self, of one's knowledge, and of interpersonal skills. At a larger scale, UA also challenges the predominant negative reputation of these two neighbourhoods.

Therefore, we demonstrated that even in low-income or marginalized contexts, UA can subscribe to a greater dynamic of revitalization or transformation of space into place since local residents usually imbue space with their own meanings. They can also offer useful insights into the functional and cultural aspects of the existing space to transform it into a significant place.

This study's findings indicate that some principles for the creation of a meaningful place could be met even though the place-making framework as an ante-program's method was not intentionally used ((1) community network and vision, (2) function and design, (3) iterative development, and (4) dealing with obstacles). Among the consequences of this is the possibility of what Karge [16] has called unintended place-making can occur in deprived neighborhoods which can in turn help in admirable transformation of such urban spaces.

The most important limitation of this study lies in the limited time we had to collect our data in the neighborhoods. We collected the data during a two-month period (July and August 2019) owing to the political instability in Haiti and the upsurge of crimes in Martissant and Cité Soleil. Another limiting methodological factor was the sites where most of the participants' interviews were conducted, which were the UA garden sites or the organizations' offices. Unfortunately, this may have placed the participants in contexts wherein they were more likely to speak positively about their experiences. This is among the factors known as the Hawthorne effect that other researchers used to explain unwanted effect of confounders in experimental or social research [84].

Furthermore, one of the issues we did not address in this current study was how the organizations can make their process more inclusive so that some sub-groups of residents would not feel excluded. Observation of UA activities underlines how local organizations help in networking, in mediating tensions and in developing collaborations between participants [85]. Despite good intentions to train people and to reinforce social participation, organizations also contribute to induce a certain vision on urban planning and development [86]. This type of process could have a larger impact if it aimed to support the most vulnerable urban dwellers in a way that considers their demands and their will to take part to the city [87]. This would give rise to a sense of community that transcends the gardening sites and goes beyond the UA programs' participants to impact the entire neighborhood. It would also help to question the dominant narratives about the neighbourhoods as well as the projects supported by decision-makers regarding planning and urban development more largely.

Nevertheless, our findings should be interpreted with caution since they may not be transferable to entire neighborhoods or surrounding areas with different socio-economic contexts. Ethnographic research, which requires more observations and greater interactions with the participants, as well as the immersion of the researchers in the daily life of the participants, could perhaps have given us a clearer picture of the role of UA in the transformation of spaces into places in Martissant and Cité Soleil.

Despite these limitations, we believe that our exploratory work has enhanced our understanding of the participants' motivations and the role of UA in the process of these neighborhoods' transformations. Our research contributes to the debate on how place-making can occur in low-income neighborhoods or countries. While urban planners usually take for granted that deprived neighborhoods lie outside the planning norms [58], the solutions should not be sought in external processes that do not understand the meanings that these places hold for their residents. This research has highlighted that spaces in deprived neighborhoods have meanings for their residents, and when those people are supported, they can use their creativity to reshape the planning of their environment and reclaim open spaces in a social perspective that extend beyond food concerns. Future research that adopts a more holistic socio-spatial approach while promoting urban justice in deprived neighborhoods may reveal further important roles that UA can play in the positive and inclusive place-making processes.

4.8 References

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Conclusion

Cette section de conclusion est organisée autour de : 1) un rappel des objectifs de notre travail de recherche, 2) une synthèse des résultats obtenus, 3) une présentation des apports théoriques, méthodologiques et pratiques de notre étude exploratoire sur l'agriculture urbaine dans différents contextes, 4) une mise en évidence des contributions et limites du travail réalisé, et des préconisations pour mieux encadrer l'AU dans les quartiers défavorisés et consolider les recherches futures dans le domaine.

Rappel des principaux objectifs de notre démarche

En dépit de ses multiples bienfaits sur les déterminants de la santé et sur le cadre de vie, et malgré un intérêt grandissant des résidents urbains, l'AU n'est pas toujours considérée comme intervention prioritaire dans l'aménagement et dans la planification des villes [1, 2]. Cela s'explique en partie par le fait que l'AU est en pleine mutation. Elle s'inscrit dans un ensemble de solutions visant à fournir une alternative aux problèmes inhérents au modèle productiviste, qui sous-tend les systèmes agro-alimentaires traditionnels (utilisation intensive de substances toxiques, émissions de gaz nocifs, etc.) [3]. Toutefois, sa reconnaissance institutionnelle comme une activité urbaine à part entière et sa prise en compte dans les politiques publiques font défaut [4]. La majorité des villes n'offre pas de cadre légal ou de politiques inclusives qui viendraient soutenir et encadrer la pratique. Pourtant, les organismes publics ou non gouvernementaux travaillent à élargir le mouvement dans les grandes villes et ce, tant dans les pays du Nord que du Sud.

Dans les pays du Sud, ou dans les milieux moins favorisés des villes du Nord, l'AU est un symbole de lutte contre les inégalités sociales et elle est présentée comme un outil de justice alimentaire. Cela dit, certaines initiatives, notamment en milieu défavorisé, tendent à reproduire des rapports de forces inégaux et à contribuer à l'exclusion sociale qu'elles cherchent pourtant à contrer [5, 6]. La recherche scientifique sur le sujet, elle-même, est critiquable en ce qu'elle tend à aborder l'AU selon une approche centrée sur les problèmes de sécurité alimentaire et de nutrition quand elle étudie les milieux moins favorisés et selon une approche multidimensionnelle lorsqu'elle étudie des contextes plus nantis. Cela dit, il apparaît essentiel d'éviter que les interventions réalisées par différents organismes communautaires dans le but de favoriser la sécurité alimentaire dans les quartiers défavorisés, se fassent sans lignes directrices des autorités municipales. De même, l'analyse des motivations des pratiquants de l'AU et leur relation au contexte socioéconomique s'avère essentielle. Une telle démarche peut servir de base utile pour guider l'élaboration de plans d'action visant à mieux encadrer l'AU et à faciliter son positionnement dans l'aménagement des villes.

Loin de prétendre apporter une réponse à l'ensemble des problèmes soulevés, cette thèse vise à mettre en lumière les caractéristiques et motivations des pratiquants de l'AU dans des quartiers moins favorisés de trois

villes de différents contextes socioéconomiques. Pour cela, quatre objectifs ont guidé le cheminement du travail :

- 1) Développer une stratégie de recherche documentaire pour caractériser l'ensemble des impacts de l'AU sur la santé et ses déterminants ;
- 2) Identifier les impacts de l'AU sur la santé et ses déterminants (santé, sécurité alimentaire, capital social) et caractériser les résultats selon le niveau d'influence (individuel, ménage, communautaire) et le niveau de revenus des pays (élevé, moyen et faible) ;
- 3) Décrire les motivations tout en dressant le profil des individus qui pratiquent l'AU dans des quartiers moins favorisés de Montréal (Canada) et de Quito (Équateur).
- 4) Examiner si l'AU observée dans les quartiers défavorisés de Port-au-Prince (Haïti) répond aux principes de transformation des espaces urbains détériorés.

Rappel des principaux résultats

En dépit, d'un nombre considérable d'études scientifiques qui abordent les impacts bénéfiques de l'AU sur la santé et ses déterminants, les observations ont démontré une importante variabilité dans l'ensemble des résultats. D'un côté, un grand nombre d'études sont critiquées en raison de leur manque de preuves empiriques concernant le lien entre AU et santé, la mauvaise qualité des données ou un manque de rigueur méthodologique [7, 8]. D'un autre côté, très peu de recherches s'attardent à évaluer les impacts de l'AU par une approche holistique, qui engloberait les effets favorables et défavorables de cette activité sur la santé et ses déterminants [9, 10].

À cet effet, la revue systématique de la littérature des impacts de l'AU sur les déterminants de la santé, présentée dans les deux premiers chapitres, contribue à enrichir la discussion quant aux principales lacunes observées dans la recherche en AU. Elle propose une stratégie de recherche documentaire rigoureuse pour recenser les études pertinentes dans des bases de données bibliographiques scientifiques. En appliquant cette méthodologie de recherche exhaustive, 101 études ont été retenues et intégrées dans la revue systématique. Cette revue a permis d'analyser la portée géographique de la recherche scientifique concernant les impacts de l'AU sur la santé et ses déterminants. Selon les résultats obtenus, 38% et 37% des études ont été respectivement menées ou ont rapporté des résultats relatifs à l'Amérique du Nord et à l'Afrique subsaharienne. Ce constat traduit un manque de diversité géographique dans les études scientifiques publiées sur l'AU. De plus, il est surprenant et intéressant de noter que les régions les moins étudiées sont justement celles où l'AU est largement reconnue et pratiquée, comme dans les régions latino-américaine et caribéenne.

En ce qui concerne les méthodologies utilisées dans les recherches sur l'AU, la recension a révélé une grande diversité dans l'analyse des impacts sur la santé et ses déterminants : 51% des études ont utilisé des méthodes quantitatives, 29% des méthodes qualitatives et 21% des méthodes mixtes. Les études quantitatives et mixtes mettent en perspective, de manière générale, les impacts positifs de l'AU sur des indicateurs comme la sécurité alimentaire et nutritionnelle et la santé mentale et physique. Par exemple, certaines études ont démontré que

l'AU permet d'augmenter la consommation des fruits et légumes, d'améliorer la sécurité alimentaire des agriculteurs urbains et l'état nutritionnel des enfants. En revanche, notre revue systématique nous amène à observer que ces résultats sont principalement basés sur des enquêtes transversales, et reposent sur de l'autodéclaration. La plupart des études mobilisent des outils qui ne sont pas appropriés pour mesurer les indicateurs de la sécurité alimentaire et de la nutrition. De plus, pour un grand nombre d'études quantitatives, les conclusions ne sont pas toujours appuyées par des relations statistiques significatives. Autrement dit, la rigueur des conclusions est parfois discutable. En outre, les résultats de certaines études quantitatives s'intéressant aux effets négatifs de l'AU sur la santé et évaluant les risques liés à la consommation d'aliments cultivés dans des sols urbains contaminés, ne sont ni concluants ni éclairants. Ces travaux recourent à une estimation par les chercheurs de la quantité des produits consommés ou de la quantité de sol ingérée accidentellement par la population étudiée. Notre recommandation est d'utiliser une approche recourant à l'évaluation réelle des quantités pour mieux évaluer les impacts sur la santé des produits cultivés dans des sols urbains contaminés. Notre revue systématique permettra probablement à d'autres chercheurs de reprendre la méthode pour mieux explorer l'évolution des connaissances à ce sujet dans les cinq ou dix prochaines années.

Les études qualitatives, pour leur part, mettent en exergue un ensemble de bénéfices perçus et de motivations personnelles dans la pratique de l'AU. Les bénéfices perçus par les pratiquants de l'AU sont généralement similaires à leurs motivations. Parmi les bénéfices et motivations les plus fréquemment rapportés dans la littérature, nous retrouvons les apports alimentaires (quantité et qualité), l'amélioration de la santé physique et mentale, le renforcement du capital social, et les économies réalisées sur les dépenses alimentaires.

Nous avons également constaté que les études en AU réalisées dans les pays à revenu élevé sont plus susceptibles d'évaluer les impacts au niveau des individus et/ou des communautés, tandis que les études portant sur les pays à revenu intermédiaire et faible explorent les contributions de l'AU sur les déterminants de la santé au niveau des ménages et des individus, en tenant peu compte de l'aspect communautaire. Un autre aspect important observé dans notre revue systématique est le manque d'études comparatives mettant en jeu des villes présentant des contextes socioéconomiques variés. En effet, malgré la diversité géographique de la littérature existante, l'AU reste un sujet étudié dans des contextes spécifiques ou locaux. Très peu d'études primaires visaient à comparer les pratiques d'AU dans des milieux contrastés. Enfin, l'ensemble des résultats de cette revue systématique a démontré une grande diversité méthodologique pour étudier l'AU, mais également la complexité sous-jacente du phénomène.

Le troisième article présenté dans cette thèse répond en partie à cette lacune observée dans la littérature en faisant une comparaison des caractéristiques et motivations des pratiquants de l'AU dans des quartiers moins favorisés de villes de pays à revenu élevé (Montréal) et à revenu moyen (Quito). Nos résultats nous permettent

de constater qu'à Montréal, la majorité des pratiquants sont des employés à temps plein et pratiquent l'AU en tant qu'activité secondaire. Cela contraste avec le cas de Quito, où l'AU est pratiquée principalement par des femmes, généralement sans emploi formel, et utilisant leurs jardins comme un moyen de nourrir leur famille. À Montréal, le capital social développé au travers du jardin est une motivation à la pratique. Ce capital est perçu comme une récompense par rapport à leur engagement dans l'AU. À Quito, le capital social associé aux activités de l'AU ne semble pas être un motif d'engagement déterminant. En effet, les pratiquants sont davantage motivés par les retombées économiques de l'AU en matière d'économies sur les dépenses alimentaires et de source de revenus. La perception des bénéfices de l'AU sur la santé mentale et physique est aussi différente dans les deux villes. Si à Montréal les bienfaits de l'AU sur la santé mentale et le bien-être sont mis en avant, à Quito les pratiquants sont davantage convaincus des bénéfices de l'AU sur leur santé physique.

Néanmoins, il existe des similitudes entre les pratiquants de l'AU de ces deux villes présentant des contextes socioéconomiques différents. Par exemple, dans les deux cas, les participants ont exprimé un sentiment de fierté lié à l'autoproduction alimentaire. Ils valorisent aussi l'AU comme une intervention capable de renforcer leurs connaissances et compétences à travers les activités développées dans le jardin et au contact des autres jardiniers.

Les motivations et caractéristiques des pratiquants de l'AU à Montréal et Quito nous ont également permis de brosser le portrait-type de l'individu pratiquant cette activité dans un quartier défavorisé. Nous proposons une typologie comprenant quatre profils de pratiquants, que nous présentons ici de manière succincte.

Le premier type est celui des pratiquants « éco-engagés », que l'on retrouve essentiellement à Montréal et qui sont majoritairement de jeunes adultes avec une formation universitaire et un emploi stable. Ces éco-pratiquants font de l'AU dans le but de prendre du recul par rapport à leur travail, de passer du temps à l'extérieur et d'avoir une alimentation de qualité. Ces pratiquants sont de fervents critiques du système alimentaire contemporain. Ils croient qu'une bonne nutrition est utile pour rester en santé. Ils n'ont pas forcément une formation en agriculture et sont désireux d'apprendre. Le deuxième profil-type est celui des « socio-engagés », qui correspond à un groupe présentant une plus grande diversité de niveaux de formation académique. Les socio-engagés sont plutôt motivés par le désir de forger des relations sociales par le biais des activités d'AU. Ils valorisent la fraîcheur des aliments produits, mais sont peu sensibles à la dimension santé. Le troisième type de pratiquants est celui des « écono-experts ». Ces agriculteurs urbains ont une expérience préalable en agriculture, acquise dans certains cas auprès de leurs parents. Issus de milieux ruraux et ayant emménagé en ville, ils voient l'AU comme un moyen de renouer avec leur passé ou leur culture. Ils sont moins soucieux de l'environnement que les autres profils décrits précédemment et davantage motivés par les avantages économiques qu'ils tirent de leurs jardins. Ils sont plus sensibles aux aspects productifs de l'AU. Enfin, le quatrième type, les « pratiquants versatiles »,

est un groupe composé majoritairement de femmes impliquées dans une grande diversité d'activités d'AU. Ces pratiquants versatiles ont des motivations similaires à celles du groupe précédent. Comme les écono-experts, la majorité a terminé ses études secondaires et a connu l'agriculture dans le passé. Ces pratiquants sont motivés par le rendement de leur jardin. Ils cultivent des aliments nutritifs et sans produits chimiques pour nourrir leur famille, économiser de l'argent sur leurs dépenses alimentaires et, dans certains cas, générer des revenus supplémentaires. Ils diffèrent des écono-experts en ce qu'ils valorisent des pratiques durables (Tab. 3.3).

Les éco-engagés et les socio-engagés sont prédominants à Montréal, alors que les écono-experts et les pratiquants versatiles sont majoritaires à Quito (Fig. 3.3). Un nombre significatif d'immigrants qui évoluent dans les jardins communautaires de Montréal répondent aux caractéristiques des écono-experts, ce qui ouvre des perspectives de recherche futures intéressantes par rapport aux aspects culturels de l'AU dans cette ville.

Le quatrième chapitre fait état d'une étude exploratoire ayant pour objectif d'appréhender les expériences des pratiquants de l'AU dans la transformation des espaces et construction de milieux de vie. En s'intéressant à deux quartiers défavorisés et stigmatisés par la violence à Port-Au-Prince, la recherche a démontré que l'AU peut contribuer à la dynamique de revitalisation ou de transformation de l'espace physique en un milieu de vie animé et valorisé. L'article présente comment les résidents locaux et les significations qu'ils donnent à l'espace sont importants dans les projets d'AU. Les résultats de cette étude indiquent que certains principes sont importants à prendre en compte dans la perspective de la création d'un milieu de vie agréable, à savoir : (1) le réseau communautaire et la vision préexistants, (2) la fonction et la conception du jardin nourricier, (3) le développement itératif comme mode de fonctionnement, (4) la gestion des obstacles et l'établissement de compromis. Ces principes ont présidé, bien que de manière informelle ou non-intentionnelle, aux programmes d'AU des quartiers défavorisés de Port-Au-Prince que nous avons observés. En effet, il apparaît que les porteurs de ces programmes ne connaissaient pas le cadre de création de milieu de vie (de type *place-making*).

Ainsi, malgré la réputation négative des deux quartiers défavorisés de Port-Au-Prince (Cité Soleil et Martissant), décrits souvent comme des milieux dangereux caractérisés par des comportements antisociaux et des taux élevés de criminalité, nos résultats montrent que leur transformation physique, grâce aux activités d'AU, offre une image alternative de ces lieux. L'AU participe à la transformation, de ces endroits marginalisés pour ses habitants. La plupart des participants interrogés ont fortement associé les activités d'AU aux changements positifs dans leurs quartiers. Nous avons également montré que la pratique de l'AU renforce le sentiment d'appartenance au groupe, ce qui crée du réconfort. Les activités d'agriculture urbaine contribuent à favoriser de nouvelles relations en renforçant les liens sociaux entre les habitants. Au fil du temps, ces nouvelles représentations peuvent également amener les gens à élargir leur réseau, à obtenir une voix politique et à

renforcer leurs compétences. Ce faisant, elles contribuent à leur donner un certain pouvoir d'action sur leur milieu et une certaine influence dans leur quartier.

Notre étude fait la démonstration que les espaces d'AU peuvent être considérés comme des lieux de renforcement des capacités, où les idées et motivations individuelles peuvent être transformées en actions collectives. Le jardin produit de la nourriture, mais c'est également un lieu où les gens peuvent utiliser leur intention et leur imagination pour créer des initiatives innovantes. Les exemples observés à Port-au-Prince sont éloquentes : l'AU est l'occasion pour les habitants de valoriser les déchets – par exemple, les vieux pneus laissés en bordure de chemins, – en les transformant en conteneurs pour la culture de plantes. L'AU peut devenir un outil d'embellissement et d'appropriation de l'espace. Elle peut contribuer à changer le discours autour des quartiers stigmatisés par les enjeux liés à la sécurité. Nous avons également souligné qu'ainsi les résidents pouvaient réassigner une signification (positive) à leurs espaces de vie et que, lorsque ces personnes sont soutenues, elles peuvent utiliser leur créativité pour prendre part à la planification de leur environnement.

Contributions et forces de la thèse

La contribution de cette thèse repose sur une combinaison originale d'éléments théoriques et méthodologiques qui, à notre connaissance, n'a pas été réalisée auparavant. Par son positionnement méthodologique, elle est de nature exploratoire ; elle articule une analyse rigoureuse et systématique de la littérature scientifique à une série d'analyses qualitatives s'appuyant sur des cadres théoriques et conceptuels solides (autodétermination, déterminants de la santé, *place-making*), et portant sur trois terrains, correspondant à des contextes socioéconomiques différents. Cela multiplie les possibles applications des résultats et étend leur portée, puisqu'ils seront pertinents pour des groupes d'acteurs divers. À cet égard, la thèse contribue à l'avancement des connaissances dans plusieurs disciplines, mais favorise également une compréhension interdisciplinaire d'un phénomène particulièrement complexe comme l'AU. Nous identifierons dans cette section les contributions théoriques, méthodologiques et pratiques de nos travaux.

Apports théoriques

D'un point de vue théorique, la thèse questionne la tendance des études scientifiques à analyser l'AU en utilisant des approches distinctes selon que le terrain d'observation se situe dans le Sud global ou dans le Nord global. Alors qu'il est largement question de sécurité alimentaire dans les pays du Sud, la perspective appliquée dans les pays du Nord global peut être qualifiée d'holistique [11, 12]. Cela contribue à confiner les pays du Sud dans un rapport de développement urbain sectoriel et dont la portée est limitée. Nos résultats démontrent tout l'intérêt d'élargir la perspective et d'aborder l'AU comme un outil d'aménagement et de développement plus global. Ils démontrent que, même dans des contextes difficiles et de pénurie alimentaire comme c'est le cas dans les quartiers défavorisés de Port-Au-Prince, la fonction purement alimentaire peut être reléguée au second plan. À

l'inverse, dans les pays du Nord, les apports alimentaires peuvent aussi avoir une grande importance aux yeux des pratiquants de l'AU. Comme mentionné par Pourias [13], au-delà de la fonction alimentaire, la qualité des produits de l'AU, leur signification pour celui qui les a plantés, leur rôle dans la construction de liens sociaux, sont complémentaires aux autres fonctions des jardins, et ceci indépendamment du contexte socioéconomique. Ces résultats corroborent les arguments de Gray et al. [14], qui soutiennent que les dichotomies productivistes et post-productivistes sont quelque peu déplacées, car les différences entre le Nord global et le Sud global deviennent de moins en moins évidentes pour ce qui a trait aux pratiques de l'AU. La réduction des motivations des pratiquants des pays du Sud aux simples aspects productifs et de consommation est réductionniste en ce qu'elle ne permet pas de saisir la complexité du phénomène et les dimensions, pourtant importantes, que sont les questions foncières et le rôle de l'AU dans la configuration sociale et spatiale des villes. Nos résultats contribuent à montrer qu'il est important de ne pas préjuger de la dominance d'une fonction sur une autre [13]. La thèse plaide également en faveur de la création d'un cadre de recherche visant à mieux explorer les autres fonctions sociales de l'AU dans le contexte des pays du Sud.

En outre, nos résultats nous ont permis de dégager des pistes faisant de l'AU un processus favorable à la transformation des quartiers défavorisés. En exposant comment les citoyens s'engagent dans la reconstruction de leurs quartiers à travers l'AU, notre étude dans les quartiers défavorisés de Port-Au-Prince renforce les arguments de plusieurs théories sur le droit à l'autogestion ou à la réorganisation des espaces [15, 16]. La thèse démontre qu'à travers l'AU les citoyens peuvent s'approprier des espaces urbains et leur attribuer de nouvelles significations. Notre intérêt pour les motivations des pratiquants a également contribué à renforcer les réponses pouvant être faites aux critiques des mouvements de revitalisation des quartiers défavorisés, concernant notamment les vrais bénéficiaires de la transformation des espaces.

Enfin, en synthétisant les connaissances scientifiques, la revue systématique présentée dans les deux premiers chapitres offre un support théorique important et ouvre à de futures recherches dans le domaine de l'AU. Les lacunes identifiées par rapport aux portées géographique et méthodologique, l'évaluation des impacts négatifs de l'AU en milieu urbain et les questions liées à la durabilité des relations sociales développées dans les jardins sont autant de pistes de recherche fertiles pour les chercheurs et ce, dans diverses disciplines (santé publique, aménagement, sociologie, etc.).

Apports méthodologiques

Sur le plan méthodologique, notre démarche s'appuie sur une approche qualitative de nature exploratoire qui combine les méthodes d'une revue systématique de littérature, un questionnaire de données sociodémographiques et des entretiens semi-dirigés sur trois terrains. Ainsi, elle contribue aux connaissances et outils disponibles dans le domaine de l'AU et ce, à plusieurs niveaux.

Dans un premier temps, le choix de réaliser une étude systématique pour l'appliquer au domaine de l'AU est une contribution significative du fait de la rareté de ce type de travaux dans le domaine [7, 8, 17]. La stratégie de recherche (Annexe A, *Additional file 1*) et l'analyse documentaire présentées dans les deux premiers chapitres utilisent une grande variété de mots clés capables de recenser une diversité d'études dans plusieurs bases de données bibliographiques scientifiques. Cette stratégie de recherche est présentée de manière simple et rend explicite le chemin à suivre pour la reproduire. Ce caractère reproductible est un apport méthodologique pour de futures études qui s'intéresseraient à l'évolution des motivations à la pratique de l'AU, mais aussi, plus largement, à d'éventuelles recherches souhaitant intégrer un volet d'études systématiques.

Dans un second temps, la revue systématique présentée combine plusieurs outils pour présenter une méthode originale d'évaluation de la qualité des études incluses. Cela reste sans doute l'une des contributions les plus significatives de la revue systématique, puisqu'il est rare de retrouver dans la littérature des études systématiques de type *scoping review* qui proposent une évaluation de la qualité des études analysées. Nous avons fait ce choix car nous étions conscients de l'importance de considérer les biais potentiels avant de tirer des conclusions définitives sur l'état des données probantes disponibles dans la littérature. De plus, les outils développés (Annexe A, *Additional file 2* et 3) ont permis d'évaluer différents types d'études (quantitatives, qualitatives et mixtes), et ils ont été déjà cités par d'autres chercheurs comme étant mieux appropriés pour évaluer la qualité de ces différents types d'études [18].

Les données présentées dans cette thèse ont été recueillies dans trois villes présentant trois contextes socioéconomiques contrastés. À notre connaissance, aucune étude sur l'AU ne s'était jusqu'ici penchée sur les contrastes des motivations des pratiquants selon le statut socioéconomique de leur lieu de vie. Par ailleurs, certaines études sur la perception des bénéfices de l'AU sont parfois critiquées car, les chercheurs étant parfois pratiquants, elles sont jugées partiales [7, 8, 12, 19]. En permettant de dégager de nouveaux éléments avec des données issues des discours de pratiquants sur le terrain, notre étude contribue à mieux orienter les propos entourant les discours idéalistes de la recherche en AU.

Apports pratiques

En lien avec les contributions théoriques et méthodologiques, les retombées pratiques de notre étude se déclinent à différentes échelles. Nos résultats peuvent servir d'appui pour les politiques publiques visant à la promotion de la santé et l'amélioration du cadre de vie en milieu urbain, plus particulièrement dans les quartiers défavorisés. Bien que l'approche productiviste ou de consommation soit très présente dans l'agenda des promoteurs de l'AU dans les quartiers défavorisés, nous avons pu démontrer que l'approche basée uniquement sur la sécurité alimentaire et nutritionnelle n'est ni le seul, ni forcément le meilleur, point d'entrée pour les programmes d'AU dans ces milieux. En effet, la fonction alimentaire peut ne pas être la plus pertinente aux yeux

des pratiquants, d'où la nécessité de promouvoir l'AU avec une vision holistique, comme étant une intervention multidimensionnelle. Les autorités municipales des pays du Nord comme du Sud gagneraient à intégrer ces éléments dans leurs stratégies afin de mieux soutenir les citoyens. Par exemple, dans le cas de Montréal, nous avons souligné la forte compétition que se livrent malgré eux les ménages pour l'attribution d'un lot et les longues listes d'attente pour l'intégration des jardins communautaires. Souvent, ces postulants, qui attendent la libération d'un jardin, ne sont pas intéressés par les aspects productifs, du moins pas principalement. Ils cherchent à renforcer leur capital social ou à entretenir des liens avec la nature et avec leur milieu. En plus de planifier la réserve d'espaces voués à l'agriculture sur son territoire, la municipalité pourrait réorienter ces postulants vers des jardins collectifs où la productivité passe au second rang, derrière l'engagement social et l'apprentissage collectif. Notre étude comparative entre Montréal et Quito montre qu'il existe certaine variabilité d'engagement et de savoir-faire entre pratiquants d'une même ville. À cet égard, la typologie de pratiquants présentée dans le troisième chapitre pourrait servir d'outils pratique à cette démarche, en contribuant à éclairer les manières de moduler les jardins : certains jardins pourraient être aménagés de façon à répondre simultanément aux différents types de pratiquants alors que d'autres pourraient être consacrés à un type en priorité, selon ce que les organismes du milieu permettent de cibler. De même, la connaissance des différents types de pratiquants permettrait aux décideurs et aux organismes de mieux considérer les particularités contextuelles et de cibler des interventions et activités destinées à la population locale autour des projets d'AU.

Un autre apport pratique de notre thèse touche à l'élaboration d'outils d'évaluation des impacts de l'AU. Par ses multiples formes et fonctions, l'AU se présente comme une solution d'avenir pour l'aménagement des villes contemporaines, cependant, son caractère divers et polymorphe et les outils pour assurer sa pérennité restent encore partiellement explorés. D'un côté, il existe très peu de données sur la préférence des produits cultivés dans les jardins d'AU, leur destination ou encore leur utilisation [13]. D'un autre côté, les questions liées à la pollution inhérente aux villes sont des éléments qui interpellent les entités soucieuses de protéger la santé des citoyens (Ibid.). Dans cette perspective, les impacts socioéconomiques gagneraient à être mieux cernés. La revue de littérature réalisée dans la thèse se présente comme un cadre pour l'évaluation des impacts individuels ou communautaires des interventions en AU.

Enfin, les résultats de la recherche présentés dans le dernier chapitre pourront aussi s'avérer une source d'inspiration pour encourager une meilleure utilisation des espaces défrichés des quartiers défavorisés. Avec cette étude de cas des quartiers de Cité-Soleil et Martissant, nous avons démontré que les activités de l'AU ont un sens et un impact aussi bien au niveau des pratiquants, qu'au niveau de l'image des quartiers en question. La thèse invite les décideurs à utiliser la créativité locale pour améliorer les aspects physiques du cadre bâti et à mobiliser l'AU pour tisser des liens sociaux entre les habitants et avec l'environnement physique de ces milieux.

Les principes discutés montrent aussi des mécanismes par lesquels des initiatives locales, avec très peu de ressources financières peuvent arriver à se mettre en œuvre.

Les limites de la thèse

Cette thèse avait pour objectif d'explorer les caractéristiques et motivations des pratiquants de l'AU dans trois contextes socioéconomiques contrastés. Dans l'ensemble, les résultats présentés dans les différents chapitres ont permis de mettre en évidence l'importance de la variabilité de ces motivations. Néanmoins, la plus grande limite de cette thèse demeure le fait que les participants n'ont été interviewés qu'une seule fois. Cette limite s'explique par des contraintes de temps et de ressources. Assurément, l'idéal serait de déployer une approche longitudinale et de pouvoir interroger les pratiquants à plusieurs reprises pour mieux analyser l'évolution de leurs motivations selon les dynamiques du contexte et pour mieux appréhender la cohérence de leurs discours. Aussi, le lieu et le moment des entretiens sont des facteurs qui peuvent influencer les discours des participants. Dans notre cas, les entretiens se sont déroulés dans les jardins, dans les bureaux des organismes ou chez les participants. Les entretiens qui ont pu être menés dans les locaux des organismes sont susceptibles d'avoir incité les participants à s'exprimer de manière plus positive concernant leur expérience. Il est possible que le lieu de l'entretien ait influencé à la baisse le poids des contraintes perçues par les participants quant à leur pratique de l'AU. Pour limiter ce possible biais, notre stratégie a été de solliciter et de mobiliser un groupe important de participants dans chacun des terrains d'études et de laisser à chaque personne le soin de décider de l'endroit où elle souhaitait réaliser l'entretien.

En ciblant des terrains d'études dans trois pays différents, nos constats et notre compréhension des motivations des pratiquants sont limités. En effet, il faudrait une plus longue période pour approfondir encore davantage la compréhension de la réalité des pratiquants. Pour cette raison, nous avons procédé avec précaution au moment de généraliser nos résultats. Néanmoins, la combinaison d'une diversité de sources de données, en confrontant notamment des données secondaires issues de la revue systématique et des données primaires, permet de contourner cette limite. Rappelons, par ailleurs, que notre objectif premier n'était pas d'explorer l'évolution des motivations dans le temps, mais bien de saisir les contrastes selon le contexte.

Perspectives de recherches futures

Plusieurs pistes de recherche ont été formulées dans chacun des quatre chapitres de cette thèse. Mentionnons entre autres la compréhension de l'évolution et le changement des motivations au cours du temps, comme étant un sujet particulièrement intéressant à explorer. En effet, les motivations individuelles sont dynamiques. Elles peuvent donc changer et évoluer avec le temps, les pratiques et le mode d'organisation des jardins. Le rôle des politiques et des interventions municipales et métropolitaines sur l'évolution des motivations serait sans doute à interroger. Il serait également opportun de comprendre comment les relations développées entre les pratiquants

de l'AU et d'autres acteurs du milieu persistent ou se renforcent avec le temps. En outre, il y aurait matière à porter une attention plus fine aux pistes d'interventions concrètes permettant de renforcer le rôle et l'importance de l'agriculture urbaine dans les milieux de vie. À cet égard, le développement participatif d'outils d'aide à la décision pour la mise en place ou l'évaluation des impacts des projets d'AU est une piste prometteuse pour la recherche-action et dans la continuité du travail présenté ici. Le contexte dans lequel s'achève cette thèse, qui est celui de la pandémie de COVID-19 et des restrictions de toutes sortes qui l'accompagnent, invite à considérer avec plus de force encore, non seulement l'intérêt et la volonté de la population envers un renforcement de l'autonomie et de la sécurité alimentaire, mais également la pertinence de réserver des espaces centraux pour la pratique de l'agriculture urbaine. Ce contexte représente sans conteste un moment clé pour aiguïser notre compréhension de l'évolution des motivations et de l'agriculture urbaine plus largement.

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Annexe A — Éléments supplémentaires des articles

Additional file 1 Full electronic search strategy for PubMed.

PubMed search strategy performed: January 22, 2018

"Food Supply"[Mesh] OR "Food Security"[tiab] OR "Food Insecurity"[tiab] OR "Food Access"[tiab] OR "Food Availability"[tiab] OR "Food Quality"[Mesh:NoExp] OR "Food Quality"[tiab] OR "Food Safety"[Mesh:NoExp] OR "Food Safety"[tiab] OR "Food Contamination"[Mesh:NoExp] OR "Food"[Mesh:NoExp] OR "Health* Food"[tiab] OR "Income"[Mesh:NoExp] OR "Income"[tiab] OR "Cost Savings"[Mesh:NoExp] OR "Cost Savings"[tiab] OR "Poverty alleviation"[tiab] OR "Nutritional Status"[Mesh:NoExp] OR "Nutritional Status"[tiab] OR "Nutrient deficiency"[tiab] OR "Fruit and vegetable intake"[tiab] OR "Fruit and vegetable consumption"[tiab] OR "fruits and vegetables"[tiab] OR "Vegetable? intake"[tiab] OR "Vegetables"[Mesh:NoExp] OR "Fruit"[Mesh:NoExp] OR "Fruit? intake"[tiab] OR "Dietary diversity"[tiab] OR "Diet"[tiab] OR "Diet"[Mesh:NoExp] OR "Malnutrition"[Mesh:NoExp] OR "Malnutrition"[tiab] OR "Undernutrition"[tiab] OR "Overweight"[Mesh:NoExp] OR "Overweight"[tiab] OR "Obesity"[Mesh:NoExp] OR "Obesity"[tiab] OR "Quality of Life"[Mesh:NoExp] OR "Healthy Lifestyle"[Mesh:NoExp] OR "Healthy Lifestyle"[tiab] OR "Exercise"[Mesh:NoExp] OR "Physical activity"[tiab] OR "Leisure Activities"[Mesh:NoExp] OR "Leisure"[tiab] OR "Well-being"[tiab] OR "Interpersonal Relations"[Mesh:NoExp] OR "Interpersonal Relations"[tiab] OR "Social capital"[tiab] OR "Personal Development"[tiab] OR "Empowerment"[tiab] OR "education"[Mesh:NoExp] OR "nutrition education"[tiab] OR "Civic engagement"[tiab] OR "Community engagement"[tiab] OR "Mental Health"[Mesh:NoExp] OR "Mental Health"[tiab] OR "Dementia"[Mesh:NoExp] OR "Dementia"[tiab] OR "Stress, Psychological"[Mesh:NoExp] OR "stress"[tiab] OR "Perceptions of life"[tiab] OR "Cultural connection"[tiab] OR "Violence"[Mesh:NoExp] OR "Depression"[Mesh:NoExp] OR "Security perception"[tiab] OR "Health risk"[tiab] OR "Resilience"[tiab] OR "Pain"[Mesh:NoExp] OR "pain"[tiab] OR "Horticultural Therapy"[Mesh] OR "Therapeutic garden"[tiab]

AND

"Agriculture"[Mesh:NoExp] OR Agricultur*[tiab] OR "Food Production"[tiab] OR "Gardening"[Mesh] OR Community Garden*[tiab] OR Collective Garden*[tiab] OR Gardens[Mesh] OR Garden*[tiab] OR "Farms"[Mesh] OR Farm*[tiab] OR "Farms"[Mesh:NoExp] OR Allotment\$[tiab] OR Horticultur*[tiab] OR Home garden*[tiab] OR Home garden*[tiab] OR "Aquaculture"[Mesh:NoExp] OR "Aquaculture"[tiab]

AND

"Cities"[Mesh:NoExp] OR City[tiab] OR Urban[tiab] OR Metropol*[tiab] OR Suburb*[tiab] OR Town*[tiab] OR Allotment\$[tiab] OR Rooftop\$[tiab]

Additional file 2 Quality Appraisal for Quantitative studies and mixed methods studies

First Author, Year, Reference	Study design	1. Was the research question or objective in this paper clearly stated?	2. Was the study population clearly specified and defined?	3. Was the participation rate of eligible persons at least 50%?	4. Were all the subjects selected or recruited from the same or similar populations (including the same time period)? Were inclusion and exclusion criteria for being in the study prespecified and applied uniformly to all participants?	5. Was a sample size justification, power description, or variance and effect estimates provided?	6. Was the exposure(s) assessed more than once over time?	7. Were data collection tools shown to be valid?	8. Were data collection tools shown to be reliable?	9. Were key potential confounding variables measured and adjusted statistically for their impact on the relationship between exposure(s) and outcome(s)?	10. Did the statistical methods examine changes in outcome measures? Were statistical tests done that provided p values for changes?	11. Has consideration been given to any limitations of the methods or data that may have affected the results?	12. Have ethical issues been addressed and confidentiality respected?	Total # Yes rating	Overall quality ... STRONG: 12-10Y, MODERATE: 6-9Y, WEAK: 1-5Y
Abdu, 2011 [104]	Quantitative, Risk assessment	Y	N	NA	NA	N	N	Y	Y	Y	Y	Y	N	6	MODERATE
Adedeji, 2010 [32]	Quantitative, Cross-sectional	Y	Y	Y	CT	N	N	N	N	N	N	N	N	3	WEAK
Aina, 2012 [122]	Quantitative, Cross-sectional	Y	Y	CT	CT	Y	N	N	N	P	Y	N	N	4	WEAK
Alaimo, 2008 [7]	Quantitative, Cross-sectional	Y	Y	N	P	N	N	Y	Y	Y	Y	Y	N	7	MODERATE
Algert, 2016a [33]	Quantitative, Cross-sectional	Y	Y	P	P	N	N	Y	Y	N	Y	Y	Y	7	MODERATE
Algert, 2016b [34]	Quantitative, Case study	Y	Y	N	P	N	N	N	N	N	N	Y	Y	4	WEAK
Ango, 2011 [35]	Quantitative, Cross-sectional	Y	Y	CT	P	N	N	N	N	P	Y	N	N	3	WEAK

Antwi-Agyei, 2016 [105]	Quantitative, Risk assessment	Y	Y	Y	CT	N	N	Y	Y	Y	Y	Y	Y	9	MODERATE
Averbeke, 2007 [64]	Mixed methods study	Y	Y	CT	P	N	N	N	N	P	Y	N	N	3	WEAK
Beery, 2014 [125]	Mixed methods study	Y	P	CT	CT	N	N	N	N	P	N	Y	N	2	WEAK
Bleasdale, 2010 [65]	Mixed methods study, Ethnography	Y	Y	CT	P	N	N	N	N	N	Y	Y	N	4	WEAK
Brown-Fraser, 2015 [94]	Mixed methods study	N	N	N	Y	N	N	N	P	P	N	P	P	1	WEAK
Christian, 2014 [123]	Quantitative, Cluster randomised controlled trial	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	11	STRONG
CoDyre, 2014 [36]	Quantitative, Cross-sectional	Y	Y	CT	CT	P	N	N	N	N	N	Y	N	3	WEAK
da Silva, 2016 [37]	Quantitative, Case study	Y	Y	Y	Y	N	NA	N	N	Y	Y	Y	N	7	MODERATE
Darkey, 2014 [126]	Quantitative, Cross-sectional	Y	Y	Y	P	N	N	Y	Y	P	Y	N	N	6	MODERATE
De Miguel, 2016 [106]	Quantitative, Risk assessment	Y	Y	NA	NA	N	N	Y	Y	Y	Y	Y	N	7	MODERATE
Dewi, 2017 [97]	Quantitative, Case-control quasi-experimental	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	10	STRONG
Edeogbon, 2017 [38]	Quantitative, Cross-sectional	Y	Y	CT	CT	N	N	N	N	P	P	N	CT	2	WEAK
Farsang, 2009 [107]	Quantitative, Risk assessment	Y	Y	NA	NA	NA	N	Y	Y	Y	P	N	NA	5	WEAK

Frayne, 2014 [39]	Quantitative, Cross-sectional	Y	N	CT	P	N	N	Y	Y	N	Y	N	N	4	WEAK
Gallaher, 2013 [120]	Mixed methods study	Y	Y	CT	P	N	N	Y	Y	Y	Y	N	N	6	MODERATE
Gallaher, 2015 [95]	Mixed methods study	Y	Y	CT	CT	N	N	P	N	N	Y	N	N	3	WEAK
Grace, 2012 [108]	Quantitative, Cross-sectional and Risk assessment	Y	Y	Y	P	N	N	N	N	P	N	N	P	3	WEAK
Gray, 2014 [66]	Mixed methods study, before and after survey	Y	Y	CT	P	N	N	N	N	N	N	N	N	2	WEAK
Gregory, 2015 [40]	Quantitative, Cross-sectional	Y	Y	CT	CT	N	N	N	N	N	Y	N	Y	4	WEAK
Hartwig, 2016 [67]	Mixed methods study, before and after survey	Y	Y	N	P	N	Y	Y	Y	P	P	N	Y	6	MODERATE
Hawkins, 2011 [78]	Quantitative, Cross-sectional with 4 different groups of participants	Y	Y	Y	Y	N	N	Y	Y	N	Y	Y	Y	9	MODERATE
Izquierdo, 2015 [109]	Quantitative, Risk assessment	Y	Y	NA	NA	N	N	Y	Y	N	Y	Y	NA	6	MODERATE
Jongwe, 2014 [41]	Quantitative, Cross-sectional	Y	P	CT	CT	N	N	N	N	Y	Y	N	N	3	WEAK
Kaiser, 2015 [121]	Mixed methods study	Y	P	CT	Y	N	N	Y	Y	P	P	N	P	4	WEAK

Kim, 2014 [79]	Quantitative, before and after survey with control group	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	CT	10	STRONG
Kouamé, 2017 [15]	Quantitative, Cross-sectional and Risk assessment	Y	Y	CT	P	Y	N	N	N	Y	P	N	P	4	WEAK
Lente, 2012 [110]	Quantitative, Risk assessment	Y	P	NA	NA	N	N	Y	Y	N	Y	N	N	4	WEAK
Litt, 2015 [80]	Quantitative, Cross-sectional	N	Y	Y	P	N	N	Y	Y	Y	Y	Y	Y	8	MODERATE
Litt, 2011 [8]	Quantitative, Cross-sectional	Y	Y	Y	P	N	N	Y	Y	Y	Y	Y	Y	9	MODERATE
Martin, 2017 [68]	Mixed methods study	Y	Y	CT	P	N	N	Y	Y	Y	Y	Y	P	7	MODERATE
Matthys, 2006 [111]	Quantitative, Cross-sectional	Y	Y	Y	P	N	N	Y	Y	Y	Y	N	Y	8	MODERATE
Maxwell, 1998 [124]	Quantitative, Cross-sectional	Y	Y	CT	CT	N	Y	N	N	Y	Y	N	N	5	WEAK
Megson, 2011 [112]	Quantitative, Risk assessment	Y	Y	NA	NA	N	N	Y	Y	N	P	N	N	4	WEAK
Milliron, 2017 [103]	Mixed methods study	Y	Y	P	Y	N	N	Y	Y	Y	N	Y	Y	8	MODERATE
Mireri, 2013 [69]	Mixed methods study	Y	Y	CT	CT	N	N	Y	Y	P	N	N	N	4	WEAK
Miura, 2003 [70]	Mixed methods study	Y	P	Y	CT	N	N	N	N	N	Y	Y	N	4	WEAK
Mkwambisi, 2011 [71]	Mixed methods study	Y	Y	CT	P	N	N	N	N	N	P	N	N	2	WEAK

Mlozi, 1996 [72]	Mixed methods study	Y	P	CT	CT	N	N	N	N	P	N	N	N	1	WEAK
Murray, 2011 [16]	Quantitative, Risk assessment	Y	Y	NA	NA	N	N	Y	Y	Y	Y	N	N	6	MODERATE
Nabulo, 2010 [113]	Quantitative, Risk assessment	Y	Y	NA	NA	N	N	Y	Y	N	Y	N	N	5	WEAK
Ngome, 2012 [42]	Quantitative, Case study	Y	Y	CT	P	N	N	N	N	N	N	N	N	2	WEAK
Ogunkunle, 2016 [114]	Quantitative, Risk assessment	Y	Y	NA	NA	N	N	Y	Y	Y	Y	N	NA	6	MODERATE
Oladeji, 2008 [43]	Quantitative, Cross-sectional	Y	P	Y	P	N	N	N	N	P	Y	N	N	3	WEAK
Panneerselvam, 2014 [73]	Mixed methods study	Y	Y	CT	CT	P	N	N	N	N	N	N	N	2	WEAK
Park, 2016 [98]	Quantitative, Quasi-experimental	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	10	STRONG
Philander, 2016 [74]	Mixed methods study	Y	N	CT	CT	N	N	N	N	N	N	N	N	1	WEAK
Ratcliffe, 2011 [44]	Quantitative, Quasi-experimental pre-post intervention	Y	Y	N	P	N	Y	Y	Y	P	Y	Y	Y	8	MODERATE
Ruggeri, 2016 [45]	Quantitative, Case study	Y	Y	N	P	N	N	Y	Y	Y	Y	Y	CT	7	MODERATE
Salah Al-Heety, 2017 [115]	Quantitative, Risk assessment	Y	Y	NA	NA	N	N	Y	Y	P	P	N	NA	4	WEAK
Salahu, 2005 [46]	Quantitative, Cross-sectional	Y	Y	Y	CT	N	N	N	N	N	N	N	N	3	WEAK

Shinew, 2004 [81]	Quantitative, Cross-sectional	Y	Y	CT	CT	N	N	N	N	N	Y	P	N	3	WEAK
Simiyu, 2014 [75]	Mixed methods study	Y	Y	Y	Y	N	N	N	N	N	N	N	N	4	WEAK
Smart, 2015 [76]	Mixed methods study	Y	Y	CT	CT	N	N	N	N	Y	N	N	N	3	WEAK
Smith, 2014 [47]	Quantitative, Cross-sectional	Y	Y	Y	N	N	N	N	N	Y	Y	N	N	5	WEAK
Soga, 2017 [82]	Quantitative, Cross-sectional	Y	Y	P	Y	N	N	Y	Y	Y	Y	Y	Y	9	MODERATE
Spliethoff, 2016 [116]	Quantitative, Risk assessment	Y	Y	Y	CT	N	N	Y	Y	Y	Y	Y	N	8	MODERATE
Stoler, 2009 [117]	Quantitative, Cross-sectional	Y	Y	Y	Y	Y	N	P	P	P	Y	Y	Y	8	MODERATE
Taylor, 2014 [77]	Mixed methods study	Y	Y	Y	CT	N	N	N	N	N	P	N	CT	3	WEAK
Thassananakajit, 2016 [48]	Quantitative, Cross-sectional	Y	Y	Y	CT	Y	N	N	N	P	P	N	N	4	WEAK
Uzu, 2014 [118]	Quantitative, Risk assessment	Y	P	NA	NA	N	N	Y	Y	P	Y	N	NA	4	WEAK
Veen, 2016 [96]	Mixed methods study	Y	P	CT	CT	N	N	Y	N	N	N	N	N	2	WEAK
Warming, 2015 [119]	Quantitative, Risk assessment	Y	NA	NA	NA	N	N	Y	Y	P	Y	P	NA	4	WEAK
Yeudall, 2007 [49]	Quantitative, Cross-sectional	Y	Y	Y	P	N	N	Y	Y	Y	Y	Y	Y	9	MODERATE

Yusuf, 2015 [50]	Quantitative, Cross-sectional	Y	Y	CT	CT	N	N	Y	Y	N	P	N	N	4	WEAK
Zick, 2013 [10]	Quantitative, Quasi-experimental with control groups	Y	Y	Y	P	N	N	N	N	Y	Y	Y	Y	7	MODERATE
Answers: Y: YES, P: PARTIAL, N: NO, NA: Not Applicable, CT: Can't tell															

Additional file 3 Quality appraisal for qualitative and mixed methods studies

First Author, Year, Reference	Study design	1. Are the research question and or objectives clear?	2. Is the theoretical or ideological perspective of author explicit, and Has this influenced the study design, methods or research findings?	3. Is the study design appropriate to answer the question?	4. Is the context or setting adequately described?	5. Is the sample adequate to explore the range of subjects and settings, and has it been drawn from an appropriate population?	6. Was the data collection adequately described ?	7. Was the data collection rigorously conducted to ensure confidence in the findings?	8. Was there evidence that the data analysis was rigorously conducted to ensure confidence in the findings?	9. Are the findings substantiated by the data?	10. Has consideration been given to any limitations of the methods or data that may have affected the results?	11. Do any claims to generalisability follow logically and theoretically from the data?	12. Have ethical issues been addressed and confidentiality respected?	Total # Yes rating	Overall quality ... STRONG: 12-10Y, MODERATE: 6-9Y, Weak: 1-5 Y
Averbeke, 2007 [64]	Mixed methods study	Y	P	Y	Y	Y	P	P	P	P	N	NA	CT	4	Weak
Beckie, 2010 [51]	Qualitative	Y	Y	Y	Y	P	P	P	N	Y	P	Y	CT	6	MODERATE
Beery, 2014 [125]	Mixed methods study	N	P	P	Y	N	N	N	N	P	P	P	CT	1	Weak
Bleasdale, 2010 [65]	Mixed methods study,	Y	Y	Y	Y	P	P	N	N	Y	Y	NA	CT	6	MODERATE

	Ethnograph y														
Brown-Fraser, 2015 [94]	Mixed methods study	N	N	N	Y	N	Y	N	N	P	P	NA	N	2	Weak
Camps-Calvet, 2016 [83]	Qualitative	Y	Y	Y	Y	Y	Y	Y	P	Y	Y	NA	N	9	MODERATE
Chan, 2015 [84]	Qualitative, Multi-case study	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	P	Y	11	STRONG
Chan, 2016 [52]	Qualitative	Y	Y	Y	Y	Y	Y	Y	Y	Y	P	NA	CT	9	MODERATE
Clavin, 2011 [99]	Qualitative	Y	Y	Y	P	N	P	P	P	Y	N	NA	N	4	WEAK
Colasanti, 2012 [53]	Qualitative	Y	N	Y	Y	Y	Y	Y	Y	Y	N	NA	N	8	MODERATE
Corrigan, 2011 [54]	Qualitative	Y	Y	N	Y	P	P	N	N	N	P	NA	N	3	WEAK
Dunlap, 2013 [85]	Qualitative, Ethnograph y	Y	Y	Y	Y	Y	P	N	Y	Y	Y	NA	P	8	MODERATE
Gallaher, 2013 [120]	Mixed methods study	Y	P	Y	Y	N	N	N	N	Y	N	NA	CT	4	WEAK
Gallaher, 2015 [95]	Mixed methods study	Y	Y	Y	Y	Y	Y	P	P	P	P	NA	P	6	MODERATE
Gerodetti, 2016 [86]	Qualitative	Y	Y	Y	Y	P	Y	N	N	Y	P	NA	CT	6	MODERATE
Glover, 2005 [87]	Qualitative	Y	Y	Y	Y	Y	Y	Y	P	Y	N	NA	N	8	MODERATE
Gray, 2014 [66]	Mixed methods study, before and after survey	Y	P	Y	Y	P	P	N	N	Y	N	NA	P	4	WEAK
Hale, 2011 [100]	Qualitative	Y	Y	Y	P	Y	Y	Y	Y	Y	Y	Y	Y	11	STRONG

Harris, 2014 [63]	Qualitative	Y	P	Y	Y	Y	P	Y	Y	Y	N	P	Y	8	MODERATE
Hartwig, 2016 [67]	Mixed methods study, before and after survey	P	P	Y	Y	Y	Y	Y	P	Y	N	NA	Y	7	MODERATE
Hondagneu-Sotelo, 2017 [88]	Qualitative, Ethnography	N	Y	P	Y	P	P	N	N	Y	N	NA	Y	4	WEAK
Kaiser, 2015 [121]	Mixed methods study	Y	N	Y	Y	P	Y	Y	Y	Y	P	NA	P	7	MODERATE
Kortright, 2011 [55]	Qualitative, Grounded theory	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	NA	P	9	MODERATE
Martin, 2017 [68]	Mixed methods study	Y	Y	Y	Y	Y	Y	N	N	Y	Y	P	P	8	MODERATE
Meenar, 2012 [56]	Qualitative	Y	Y	Y	Y	P	N	N	N	Y	Y	NA	CT	6	MODERATE
Milligan, 2004 [89]	Qualitative, Ethnography	Y	Y	Y	Y	P	Y	Y	Y	Y	N	NA	P	8	MODERATE
Milliron, 2017 [103]	Mixed methods study	Y	N	Y	Y	Y	P	N	P	P	Y	Y	P	6	MODERATE
Mireri, 2013 [69]	Mixed methods study	Y	P	Y	Y	Y	P	N	N	P	N	NA	N	4	Weak
Miura, 2003 [70]	Mixed methods study	Y	P	Y	P	Y	P	Y	N	P	P	NA	CT	4	Weak
Mkwambisi, 2011 [71]	Mixed methods study	Y	Y	Y	Y	Y	P	N	N	Y	N	P	CT	6	MODERATE
Mlozi, 1996 [72]	Mixed methods study	Y	P	Y	Y	P	P	N	P	P	P	P	CT	3	Weak
Moyo, 2013 [57]	Qualitative	Y	P	N	P	Y	P	N	N	P	N	P	CT	2	Weak

Northrop, 2013 [101]	Qualitative	Y	P	Y	Y	P	P	P	P	P	N	NA	Y	4	Weak
Olivier, 2017a [90]	Qualitative	N	N	Y	Y	Y	P	P	N	P	N	NA	N	3	WEAK
Olivier, 2017b [58]	Qualitative	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	NA	Y	10	STRONG
Panneerselvam, 2014 [73]	Mixed methods study	Y	P	Y	Y	Y	Y	P	N	Y	N	N	CT	6	MODERATE
Philander, 2016 [74]	Mixed methods study	Y	Y	P	Y	P	N	N	N	P	N	NA	N	3	Weak
Poulsen, 2017a [59]	Qualitative	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	P	10	STRONG
Poulsen, 2017b [60]	Qualitative	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	NA	N	10	STRONG
Saldivar-Tanaka, 2004 [61]	Qualitative	Y	P	Y	Y	P	Y	P	N	Y	N	NA	N	5	WEAK
Sanyé-Mengual, 2016 [91]	Qualitative	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	NA	CT	9	MODERATE
Simiyu, 2014 [75]	Mixed methods study	Y	Y	Y	Y	P	N	N	N	P	N	NA	N	4	Weak
Smart, 2015 [76]	Mixed methods study	Y	Y	Y	Y	Y	N	N	N	Y	N	NA	CT	6	MODERATE
Spees, 2015 [92]	Qualitative	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	10	STRONG
Taylor, 2014 [77]	Mixed methods study	P	Y	Y	Y	Y	P	P	N	Y	N	NA	N	5	WEAK
Teig, 2009 [93]	Qualitative	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	P	10	STRONG
Tembo, 2013 [62]	Qualitative	Y	Y	Y	Y	P	P	N	N	Y	P	NA	P	5	WEAK
Torres, 2017 [102]	Qualitative	Y	Y	Y	Y	CT	Y	Y	Y	Y	N	NA	P	8	MODERATE

Veen, 2016 [96]	Mixed methods study	Y	Y	Y	Y	Y	Y	Y	Y	P	Y	N	NA	N	8	MODERATE
Wakefield, 2007 [5]	Qualitative	P	P	P	P	N	P	P	Y	Y	N	Y	P	3	WEAK	

Answers: Y: YES, P: PARTIAL, N: NO, NA: Not Applicable, CT: Can't tell

Additional file 4 Description of included studies

First Author, Year, Reference	City, Country, World Region	Country income level	Level of influence	Characteristic of participants	Type of UA	Study Purpose	Study design	measurement method	Outcomes assessed	Type of impacts	Key findings	Themes
Abdu, 2011 [104]	Kano, Nigeria, Sub-Saharan Africa	Middle	Community		Urban vegetable production	To determine the concentration of Zn and Cd in soil and vegetables grown in urban gardens and assess the potential health risk by estimating dietary intake and target hazard quotients of heavy metals via consumption of contaminated crops.	Quantitative, Risk assessment	Soil, and vegetable samples were analyzed and health risk was assessed	Health risk	Neutral	The major intake pathway for Zn and Cd was assumed to be vegetable consumption and soil ingestion through agricultural activities. The highest estimated Cd dietary intake was safe based on WHO recommended values. Zn intake through vegetable consumption poses no health risk to inhabitants of Kano. Intake and ingestion of Zn and Cd metals will likely have to occur over a prolonged period to experience health hazard.	SFS
Adedeji, 2010 [32]	Ondo, Nigeria, Sub-Saharan Africa	Middle	Household	n=150 women homemakers of households	Home gardening	To investigate the contributions of home gardening practices to household food security, food commonly produced, estimate income and identify problems.	Quantitative, Cross-sectional	Questionnaire, oral interview and observation	Food security, income, food supply	Positive	26% of the households have their diet supplemented with products obtained from the home gardens. 46.7% participants said home garden provides some income for them. The sale of surplus food also provide direct benefits, the highest annual income of respondents from home garden 30.7% was N10,001 - N20,000.	FS, ICE
Aina, 2012 [122]	Ibadan city, Nigeria, Sub-Saharan Africa	Middle	Household	n=70	Urban farming	To identify socio-economic characteristics of the respondents, assess the access to land by farmers and determine the factors that influence the involvement in urban farming.	Quantitative, Cross-sectional	Structured questionnaire	Income	Positive	Farm income increased with involvement in urban farming.	ICE

Alaimo, 2008 [7]	Flint, MI, United States, North America	High	Individual	n=766 individuals with a household member participating in community gardening (51.9% women 48.1% men)	Community gardening	To determine the association between household participation in a community garden and fruit and vegetable consumption among urban adults.	Quantitative, Cross-sectional	Survey, interviews by telephone, fruit and vegetable intake was measured with 8-items from the Behavioral Risk Factor Surveillance System	Fruit and vegetable consumption	Positive	Adults with a household member who participated in a community garden consumed fruits and vegetables 1.4 more times per day than those who did not participate, and they were 3.5 times more likely to consume fruits and vegetables at least 5 times daily.	FS, N
Algert, 2016a [33]	San José, CA, United States, North America	High	Individual	n= 135 individuals (n=85 community gardeners n=50 home gardeners)	Community and home gardening	To document the extent to which gardeners, particularly less affluent ones, increase their vegetable intake when eating from either home or community garden spaces.	Quantitative, Cross-sectional	Questionnaire and comparison between community gardeners and home gardeners	Food intake, BMI, cost savings, self reported health, Social capital	Positive	There was no difference in BMI between the two groups of gardeners. The two groups increased their vegetable consumption to a similar extent when eating from their gardens. Prior to harvesting vegetables from the garden, average intake of vegetables was 2.0 cups per day. Average intake doubled to 4.0 cups per day when the majority were eating from the garden, which was during the peak of the summer growing season. Average cost savings reported by both groups was similar at \$92 per month for home gardeners and \$84 per month for community gardeners. Community gardeners said their top benefits were exercise, meeting with friends and learning from other gardeners. The majority reported good to excellent health.	FS, N, HW, SCN
Algert, 2016b [34]	San José, CA, United States, North America	High	Individual	n=50 individuals	Home gardening	To measure crop output, cost savings, and nutritional value of low-income home gardeners in San Jose, California.	Quantitative, Case study	Daily records of harvest	Produce weight, cost of water, yield, type of crops	Positive	Gardeners saved an average of \$339 by growing their own vegetables. Participants consumed approximately 70% of the vegetables that they reported harvesting. Most excess produce was given to other family members (15%) and friends (13%).	FS, ICE
Ango, 2011 [35]	Birin Kebbi, Nigeria, Sub-Saharan Africa	Middle	Household	n=100 individuals age range 21-60	Urban Farming	To determine the socio-economic characteristics of the urban agricultural farmers and investigate common farming types, degree of participation in urban agriculture, and the benefits and constraints derived from the urban agriculture .	Quantitative, Cross-sectional	Structured questionnaires and oral interview	Food security	Positive	44% of the respondents perceived that urban agriculture contributes highly to food security of the household, 36% of the respondents perceived that urban agriculture contributed averagely to provision of food to the household.	FS
Antwi-Agyei, 2016 [105]	Accra, Ghana, Sub-Saharan Africa	Middle	Community	n=80 individuals	Urban farming	To determine key exposures associated with the risk of transmission of faecal pathogens in urban farmers using wastewater for irrigation.	Quantitative, Risk assessment	Irrigation water and soil samples were analyzed, observations and verbal questionnaire was administrated.	Health risk	Adverse	The study found that the use of wastewater exceeded the WHO permissible norovirus infection risk. It also found high concentrations of E. coli in irrigation water, though exposure to soil posed the highest risk as a result of frequent hand to soil and hand to mouth contacts especially during weeding and forking.	SFS

Averbeke, 2007 [64]	Atteridgeville, South Africa, Sub-Saharan Africa	Middle	Household	n=120 households	Home, group gardening, and dryland farming	To provide quantitative information on the material benefits generated from urban farming in order to assess the contribution of this activity to the food security and nutrition of participating households and to explore the meaning of urban agriculture in the livelihood of participants.	Mixed methods study	Structured and face-to-face interviews	The meaning of UA in the livelihood of participants	Positive and motivations	Home garden production provided 6.7% of the household vegetable consumption per day. Group gardeners on average supplied their households with about 6.85 kg of fresh vegetables every month, which represented 28% of the recommended consumption of vegetables for an average household in the study area. Production of food as a response to poverty, unemployment and food insecurity was the most commonly stated reason why households engaged in the different types of urban farming projects.	FS
Beckie, 2010 [51]	Edmonton, AB, Canada, North America	High	Individual	n=26 individuals	Commercial urban agriculture	To investigate the impacts resulting from senior immigrants' involvement in a pilot year of "Urban Agriculture for Senior Immigrants" project.	Qualitative	Semi-structured interviews and observations	Participants profiles, motivations and concerns for seniors participating in CG	Perceived benefits and challenges	Access to fresh and nutritious foods—for themselves, their families and friends—was of high importance to the seniors, and they were able to take home a variety of vegetables throughout the summer involvement in UA. Commercial urban agriculture contributes to the integration of senior immigrants into Canadian society. The project contributed to elevating their perception of social status within their families as well as their mental well-being. However, the study revealed some concerns about using seniors participating in the project because of public transportation and because of the fact some people see it as exploitative.	FS, HW, SCN
Beery, 2014 [125]	Johannesburg, South Africa, Sub-Saharan Africa	Middle	Individual	n=68 individuals (children)	School gardening (Institutional)	To evaluate impact of school garden on diet.	Mixed methods study	Nutrition assessment survey, teacher's feedback	Dietary intake, Dietary diversity based on participants' descriptions of foods consumed in the previous 24 hours.	Positive	The results from the nutritional assessment showed that a large percentage of children (aged eight to 12, with average age of ten) exceeded the WHO/Food and Agriculture Organization (FAO) recommendations for energy distribution regarding the intake of free sugars (79.4% of the sample), trans fats (41.2 %), and total fats (39.7 %). The gardens did contribute much-needed fresh vegetables to learners' diets, with their relatively small yields they could not significantly improve students' dietary diversity and nutritional status over the long-term as high year-round yield were not attained. The gardens appear to have played a role in changing mindsets about healthy eating and increasing knowledge of various aspects of growing, preparing, and eating health-promoting fruits and vegetables.	N, EE

Bleasdale, 2010 [65]	Phoenix, AZ, United States, North America	High	Individual and Community	n=7 community organizers, n=149 community residents	Community gardening	To examine community gardening program benefits and burdens.	Mixed methods study, Ethnography	Interviews, surveys and observation	Perceptions of benefits and burdens associated with gardening	Perceived benefits and challenges	Overall, residents' perceptions of the benefits of gardening revolved strongly around nutritious food (61%), exercise (49%), and extra food (49%). Participants also reported some perceived burdens as barriers to participate in UA activities such as: hard work, getting dirty and feeling unsafe	FS, L
Brown-Fraser, 2015 [94]	Baltimore, MD, United States, North America	High	Individual and community	n=13 survey respondents	Community gardening	To explore community gardening knowledge, beliefs, experience, perceptions and motivations among students and community participating in a nutrition program.	Mixed methods study	Online questionnaires were administrated to students and community	Participants motivations and gardening experience	Motivations	All students were involved in community gardening because of health benefits and 85% because of the opportunity to meet people. Top reasons for community members included appreciation for nature and the desire to beautify the neighborhood. Community members were also more likely to be motivated by physical activity, access to home-grown food, and social interactions.	HW, SCN
Camps-Calvet, 2016 [83]	Barcelona, Spain, Europe and Central Asia	High	Individual and Community	n=44 interviewees (27% female, 73% male), n=27 urban gardens	Allotment and community gardening	To assess contributions of urban gardens to the quality of life of their users.	Qualitative	Observations, semi-structured face to face interviews, face to face survey questionnaire	Characterization of ecosystemic services (provisioning services, regulating services, habitats services and cultural services) from UA, perception of the gardeners on the ES	Perceived benefits	The most widely ES perceived by the gardeners: learning & education (95.5%), social cohesion & integration' (88.6%), 'food supply' (81.8%), 'entertainment & leisure' (77.3%). In terms of valuation of the ES, cultural services that includes social cohesion obtained the highest average value, followed by habitat services (biodiversity).	SCN, NPE, ICE
Chan, 2015 [84]	New York City, NY, United States, North America	High	Community	n= 7 key informants, n = 5 community gardens	Community gardening	To explore the role of community gardens in coastal "red zones" of NYC by analyzing the meaning and relevance of community garden spaces in the resilience and recovery of local residents and community garden members post-Sandy.	Qualitative, Multi-case study	Interviews, observations and archival reviews	The meaning and relevance of community garden spaces in the resilience and recovery of local residents	Perceived benefits	In Campos, gardeners mobilized their support networks both before and after the storm to help ensure the well-being of local residents. Boardwalk gardeners identify community gardening as a practice that brought them great joy, satisfaction and meaning in their lives before and after Sandy. Community gardens have the potential to bolster resilience in disaster zones by aiding processes of recovery.	SCN, L, NPE
Chan, 2016 [52]	Lincoln, NE, United States, North America	High	Community	n=20 individuals	Community gardening	To explore the social-ecological functions of community gardening.	Qualitative	Semi-structured interviews and participant observation	Role of CG from the perspective of social-ecological resilience	Perceived benefits	CG provides opportunities for participants to foster resilience to the personal, cultural, and economic challenges of displacement and resettlement resulting from urban migration. Fifteen of 18 gardeners mentioned that connecting with their neighbors and other gardeners was an important part of their community gardening experience. The spaces and resources of CG empower gardeners to respond to social, economic, and environmental challenges.	FS, SCN, CC

Christian, 2014 [123]	London, United Kingdom, Europe and Central Asia	High	Individual and Community	n= 641 children (n=312 Royal Horticulture Society led n= 329 teacher led)	School gardening (Institutional)	To evaluate whether a school gardening programme can have an effect on children's fruit and vegetable intake.	Quantitative, Cluster randomised controlled trial	Telephone interviews, E-mail questionnaire and Dietary assessment (Child and Diet Evaluation Tool (CADET) with in-person recall follow-up)	Fruit and vegetable intake.	Neutral	The results have found very little evidence to support the claims that school gardening alone can improve children's daily fruit and vegetable intake. However, gardening interventions implemented at a high level within schools have the potential to improve children's daily fruit and vegetable intake by a portion.	N
Clavin, 2011 [99]	Bristol, Belfast, Brighton, and Newcastle, United Kingdom, Europe and Central Asia	High	Individual and Community	n=47 individuals (adults)	Community gardening	To report on the multiple impacts that the design of community gardens may have on the subjective wellbeing of site users.	Qualitative	Site survey, observation and semi-structured interviews with site users	Multiple impacts of CG on subjective wellbeing of users: why and how they used the sustainably designed sites and how they perceived features and processes of design to impact on their wellbeing.	Perceived benefits	Sustainably designed community gardens were found to be multifunctional (food growing, learning and community spaces) with multiple impacts on wellbeing. Users were constantly learning new things in the site. The sites offered opportunities for mental restoration through providing places to relax.	HW
CoDyre, 2014 [36]	Guelph ON, Canada, North America	High	Community	n=50 backyard gardeners + 384 Guelph residents	Backyard gardening	To evaluate the productivity of urban gardens as a way of evaluating their potential contribution to food security, it also evaluates costs of this productivity in terms of land, labour and capital.	Quantitative, Cross-sectional	Garden diary + random telephone survey (n = 384), + price of supermarket produce	Food production, economic value	Neutral	Home vegetable gardeners produced an average of 1.43 kg of fruit and/or vegetable per m2 gardened. This means that the value of these garden products would be worth \$4.58USD/kg if bought in a grocery store. The average m2 of garden produced 20.4 servings of fruits and vegetables across the season	FS, ICE
Colasanti, 2012 [53]	Detroit, MI, United States, North America	High	Community	n=10 interviewees n=72 focus group participants	Not specified	To explore ways in which urban agriculture might be perceived in relation to the urban ecosystem and sociopolitical context through semi-structured interviews and focus groups in Detroit, Michigan.	Qualitative	Semi-structured interviews and focus group	Urban agriculture practices, perceptions regarding scaling-up urban agriculture, and potential for utilizing vacant land	Perceived benefits	Participants see UA as a way to regain access to culturally appropriate foods in an affordable manner from a source they trust. Several in the group of seniors shared that more UA opportunities would be a good way to obtain food outside of the distrusted conventional market channels and also expressed a desire for healthier food access within walking distance. It can also be a way for people, in the midst of a consumer culture, to understand that they have the power to produce something of value.	FS, CC
Corrigan, 2011 [54]	Baltimore, MD, United States, North America	High	Individual and Community	n=5 individuals	Community gardening	To determine the extent to which community gardens contribute to food security.	Qualitative	In-depth interviews and field observations	Motivations on CG, changes in food budget perception	Perceived benefits and motivations	The garden does make people more aware of their involvement with food systems and provides opportunities to obtain fresh food in the Broadway East neighborhood and beyond. Increased individual food security was demonstrated by all of the gardeners. A constant supply of fresh fruits and vegetables enhances the gardeners' food security. Most gardeners donate over 50% of their produce back to the neighborhood.	FS

da Silva, 2016 [37]	Vila Nova de Gaia, Porto, Portugal, Europe and Central Asia	High	Individual	n=873 individuals	Allotment gardening	To describe the characteristics and the motivations of the population demanding for urban allotment gardens.	Quantitative, Case study	Allotment gardens application forms	Characteristics and motivations of allotment gardens applicants	Positive	To supplement the family budget (food security), occupation of leisure times (recreation), and access to organic farming (food safety) are the most mentioned motivations to apply for a MNUAG plot, followed by environmental concerns, the practice of physical exercise (health concerns), and education. 24% and 19% of the applicants mentioned supplement family food budget and access to organic food as their motivations respectively.	FS, SFS, L
Darkey, 2014 [126]	Kumasi, Ghana, Sub-Saharan Africa	Middle	Individual	n=300 individuals	Open-space vegetable growing	To determine the contribution of urban vegetable production to farmers' livelihoods in the Kumasi Metropolis of Ashanti Region of Ghana.	Quantitative, Cross-sectional	Interviewer administrated questionnaires	Livelihood (Social, Physical, natural, financial, human and informational capital)	Positive	Through vegetable production, farmers in the Kumasi metropolis can improve on their natural and physical capital assets more and significantly than information, financial, human and social capital assets.	NPE
De Miguel, 2016 [106]	Madrid, Spain, Europe and Central Asia	High	Individual	Children and adults	Not specified	To investigate the concentration and distribution of As, Sb, and Se in urban gardens in Madrid, Spain, and assess the risk of adverse health effects on users of urban gardens from exposure to those 3 elements under different exposure scenarios.	Quantitative, Risk assessment	Soil samples analysis, and health risk assessment	Health risk	Adverse	Regarding exposure pathways, the highest contribution was associated with the accidental ingestion of soil particles for both adults and children, which account for over 50% and 60% of the total risk, respectively, followed by ingestion of on-site grown vegetables and dermal absorption (inhalation of suspended particles had a negligible influence). Children were subject to larger hazard index values than adults, particularly because of their higher soil and food intakes, which are a consequence of their frequent hand-to-mouth activity and their larger food intake per unit of body weight. The human health risk assessment carried out for Madrid's urban gardens reveals that both noncarcinogenic and carcinogenic risks are acceptable and that accidental soil ingestion and consumption of self-produced vegetables are the 2 exposure pathways of most concerns, with As as the clear risk driver.	SFS
Dewi, 2017 [97]	Ibaki, Japan, East Asia and Pacific	High	Individual	n=28 individuals (n=11 and n=17 control) Adults	Community gardening	To determine the psychological and physical effects in adults with (case group) and without (control group) mental disabilities while performing community garden activities of various intensity levels.	Quantitative, Case-control quasi-experimental	Salivary amylase test and SRS-18 evaluation were performed six times. Self-assessment questionnaire of psychological state	Salivary α -amylase (sAA) level, Heart Rate, Breathing Rate (IRBR)	Positive	The results showed that following the activities, the case group exhibited decreasing Salivary α -amylase (sAA) levels while control group exhibit increasing sAA levels. However, both groups exhibited lower SRS-18 results following the activities. Compared with the control group, the case group had a significantly lower increase in the ratio of the heart rate (IRHR) (5.5%) during low-intensity work (filling pots with soil), but a	HW

											significantly higher IRHR (16.7%) during high-intensity work (turning over soil).	
Dunlap, 2013 [85]	Austin, TX, United States, North America	High	Individual and Community	n=11 individuals	Urban farming	To explore the ways in which participation in an urban garden project – Urban Patchwork – shaped volunteers' feelings toward the project garden plots, the neighbourhood, the City of Austin and/or the region of Central Texas.	Qualitative, Ethnography	Participant observation and semi-structured interviews	Participants experience related to agriculture and gardening, participants sentiments regarding their residences and city, participants involvement in the UA project	Perceived benefits	Many participants used their participation in gardening activities as a means to strengthen connections to their own family history. As a means of connecting with older relatives who had participated in various agricultural activities. Garden plots served to strengthen psychological ties to friends and relatives, living and deceased, a sense of connection to and identification with the community at large via connections to other individuals.	SCN
Edeogho, 2017 [38]	Ikorodu, Nigeria, Sub-Saharan Africa	Middle	Household	n=150 individuals	Urban farming	To examine the role of agricultural enterprises in food security status of urban farmers in Ikorodu metropolis.	Quantitative, Cross-sectional	Questionnaire and interviews	Food security,	Positive	Results showed that there is a positive and significant correlation between the food secure group and agricultural enterprises. Food security mean score of urban farmers was 2.73 indicating food secure without hunger.	FS
Farsang, 2009 [107]	Szeged, Hungary, Europe and Central Asia	High	Individual	Children and adults	Vegetable gardens	To investigate metal contamination in the gardens near the roads and evaluate human health risk.	Quantitative, Risk assessment	Analysis of soil and plant samples and estimation of health risk	Health risk	Adverse	The results showed that contact to soil, soil ingestion and consumption of plants grown on contaminated soils have not involved risk for the residents. However, the degree of risk has considerably increased if people consume exclusively vegetables grown in contaminated soils.	SFS
Frayne, 2014 [39]	11 Southern African cities (Namibia, Botswana, Lesotho, Swaziland, Mozambique, Malawi, Zambia, Zimbabwe, South Africa), Sub-Saharan Africa	Middle and Low	Household	n=6453 households	Not specified	To examine if UA contribute to food security in Southern Africa.	Quantitative, Cross-sectional	Questionnaire	Food security	Neutral	UA is not an effective household food security strategy for poor urban households—the analysis found few significant relationships between UA participation and food security. there are no significant differences in food security scores between surveyed households engaged in UA as a food source and surveyed households which were not engaged in the practice, although there is variation in its effectiveness between urban contexts (exception for some cities). Where there was a significant relationship, they found that while households engaged in UA had higher food security scores than other households, frequency of engagement in UA as a food source was associated with worsened household food security.	FS

Gallaher, 2013 [120]	Nairobi, Kenya, Sub-Saharan Africa	Middle	Household	n=306 households (153 farmers and 153 non-farmers) n= 31 interviews	Sack gardening	To demonstrate the difference between risk perception and actual risk.	Mixed methods study	Soil, plant, and water samples analysis, household surveys and interviews	Health risk perception	Challenges	Farmers were worried that various pollutants could contaminate food grown in their sack gardens. Farmers were significantly more concerned than non-farmers that soil used in the sacks may contaminate the vegetables they grew. Vegetables from sack gardens have heavy metal contamination above the recommended levels for human consumption.	SFS
Gallaher, 2015 [95]	Nairobi, Kenya, Sub-Saharan Africa	Middle	Household	n=306 surveys n=31 interviews	Sack gardening	To demonstrate that urban agriculture can be a viable and important livelihood strategy for households, even in densely populated slum environments.	Mixed methods study	Questionnaire, semi-structured interviews	Income, physical capital, natural capital, social capital	Perceived benefits	Most households reported that they earned 4,000–8,000 shillings (US\$50–100) per month. Many of the farmers viewed sack gardening as a means of saving money in their household budgets. Farmers were significantly more likely to participate in a social group, agricultural or not, than were nonfarmers.	SCN, ICE
Gerodetti, 2016 [86]	Northern UK city, United Kingdom, Europe and Central Asia	High	Individual	n= 8 participants	Allotment gardening	To examine how migrants gardeners are reshaping cultural landscapes.	Qualitative	In-depth interviews and participant observation	Time people had been cultivating, what they grew, and what meaning they ascribed to the places they grew this produce, role of food and its cultivation within wider social and cultural networks.	Perceived benefits	The study found that migrants specific practices contribute to their individual and social identities by reaffirming connections to their places of origin and embodied and affective-sensory memories attached to those, as well as adapting to new food growing landscapes. Another dimension of collective identity was the degree to which participants related their gardening practices to social ties with the diasporic communities to which they feel they belong.	SCN, CC
Glover, 2005 [87]	St Louis, MO, United States, North America	High	Community	n= 3 interviewees and n=3 focus group participants	Community gardening	To understand how the social relationships formed within community garden settings assisted community garden leaders in accessing resources.	Qualitative	Telephone interviews, Focus group, field interviews	Participants experiences as community gardeners	Perceived benefits	The relationships built in the garden space led to further socializing outside of the garden space. Many of the research participants spoke glowingly about the garden as a space in which they forged friendships	SCN
Grace, 2012 [108]	Dagoretti, Nairobi, Kenya, Sub-Saharan Africa	Middle	Household	n=20 households	Urban livestock	To estimate the risk from Cryptosporidium oocysts originating in dairy farms in urban Dagoretti, Nairobi to dairy farm households and their neighbours.	Quantitative, Cross-sectional and Risk assessment	Soil and cattle faeces samples analysis for cryptosporidium contamination, participatory mapping to capture local perspective on the origin of hazard, Questionnaires, focus groups, and quantitative risk assessment model	Health risk	Adverse	Non-dairy households' exposure to Cryptosporidium oocysts was only slightly lower than dairy households. Children under 5 years in dairy households were more exposed to Cryptosporidium oocysts. Burden of exposure falls on children.	SFS
Gray, 2014 [66]	San José, CA, United States, North America	High	Household	n=57 households (surveys) n =38	Home gardening	To study a home-gardening programme in San Jose, California, La Mesa Verde, asking whether some of the benefits found in community	Mixed methods study, before and after survey	Participant observation, interviews, focus groups and two surveys	Perceived benefits of HG programme.	Perceived benefits	Participants perceived significant savings and health benefits from their home gardens. Family's vegetable consumption increased because of their programme participation. Participants changed their	FS, SCN, ICE

				households (interviews)		gardens can be found in home gardens.					eating habits. Home gardens provided a healthy opportunity to engage in a more active lifestyle. Home gardens have benefits in terms of financial savings.	
Gregory, 2015 [40]	New York city, NY, United States, North America	High	Household	n=106 individuals	Community gardening	To characterize food-producing community gardens in New York City.	Quantitative, Cross-sectional	Soil samples analysis and survey interviews with gardeners	Food security, food diversity	Positive	Gardeners supplied a large share of their households' produce needs from their community gardens. During the growing season, 55 % of gardeners harvested more than two-thirds of the vegetables eaten in their households from their community gardens, and 22 % harvested between one- and two-thirds of their household's produce needs. A greater percentage of gardeners struggling with food insecurity relied on their gardens for more than two-thirds of their vegetables during the growing season compared to food-secure gardeners (63 % vs. 52 %) and more than one-third of their vegetables during the winter (32 % vs. 11 %). Ninety percent of food-insecure gardeners ranked their garden as their first or second produce source, compared to 72 % of food-secure gardeners.	FS, N
Hale, 2011 [100]	Denver, CO, United States, North America	High	Individual and community	n = 67 individuals n=28 gardens	Community gardening	To explore gardeners' tactile, emotional, and value-driven responses to the gardening experience and how these responses influence health at various ecological levels.	Qualitative	In-depth interviews with individuals and groups, and field observation	Aesthetic experiences of gardeners, meaning of CG for the participants, perception of gardeners on health and well-being	Perceived benefits	Participants perceived the gardens as: A place for learning 'natural' processes in the city. A place of affirmation and expression. A place for a holistic sense of health and well-being.	HW, ICE
Harris, 2014 [63]	Logan City, Australia, East Asia and Pacific	High	Individual	n=12 individuals (Refugees)	Community gardening	To explore how involvement in a community food garden supports African humanitarian migrant connectedness with their new country.	Qualitative	Semi-structured interviews	Participants motivations for gardening	Motivations	Participants consistently suggested involvement in the garden provided opportunity to build connections with others both within and beyond the garden through common interests in produce and farming. Participating in the garden offers a place for the migrant to practice their skills and knowledge—to re-connect with and celebrate their family and community background. The study also found that participation in a community food garden represents the familiar and purposeful activity of growing and harvesting crops.	FS, SCN, CC
Hartwig, 2016 [67]	Minneapolis-St. Paul, MN, United States, North America	High	Community	n=97 survey participants n=48 focus group participants	Church gardening (institutional)	To present a mixed method evaluation of a refugee gardening project hosted by area churches serving primarily Karen and Bhutanese populations.	Mixed methods study, before and after survey	Validated food security questions developed by the FAO UN; Patient Health Questionnaire 2-item screening questions (PHQ-2), and focus group	Gardening experience overall, benefits and problems, food behaviors, hunger, depression perception	Perceived benefits	78 % reported vegetable intake increased between the early and late season surveys. Numerous respondents identified the gardens as a healing space for their depression or anxiety. 92% of gardeners shared that they spent less money on food during the gardening season. A number of gardeners said that they had friends accompany them to the	FS, HW, ICE

											garden plots simply to hang out at the garden and enjoy time outside and socializing.	
Hawkins, 2011 [78]	Cardiff, United Kingdom, Europe and Central Asia	High	Individual	n=94 individuals aged between 50 and 88 years	Allotment and home gardening	To explore the potential benefits of allotment gardening for healthy aging, focusing on the opportunities for outdoor physical activity, social support, and contact with nature that allotment gardening provides.	Quantitative, Cross-sectional with 4 different groups of participants	Questionnaire, physiological and psychosocial health measures (perceived stress scale, social provisions scale, international physical activity questionnaire, SF-3v2)	BMI, Systolic and diastolic blood pressures, Lung function, perceived social support and physical activity level, health-related quality of life, perceived stress level	Positive	No significant differences in physiological measures between four activity groups. However, a significant difference in perceived stress levels was observed between the activity groups. Allotment gardeners reported significantly less perceived stress than participants of indoor exercise classes. The allotment gardeners had the highest mean scores of social support, self-rated physical health and physical activity levels, and the lowest mean sitting time, these were not significantly higher than the means of the other activity groups.	HW, L, SCN
Hondagneu-Sotelo, 2017 [88]	Los Angeles, CA, United States, North America	High	Individual and Community	n=30 interview participants	Community gardening	To understand immigrant life and social relationships that form in urban community gardens.	Qualitative, Ethnography	Participants observation and in depth interviews	Social relationships that form in the community gardens and the meanings participants held about both materiality and social relations in these gardens	Perceived benefits	The feeling of belonging to a new family-like home in the community garden was repeated by many of the Latina immigrant women who gathered at the gardens. Some participants see the community garden as a new physical space and a new family. They also consider it as a place where parents can teach children ancestral connections with the soil.	SCN, CC
Izquierdo, 2015 [109]	Madrid, Spain, Europe and Central Asia	High	Individual	Urban adult gardeners and children playing in urban gardens	Community gardening	To determine the bioaccessibility of trace element contents in soils and assess the potential risk for children and adults in those scenarios.	Quantitative, Risk assessment	Soil samples analysis and questionnaires to estimate exposure factors	Health risk	Neutral	The study revealed acceptable levels of risk, the calculated risk for adult urban farmers and for children playing in urban gardens fall below the threshold of unacceptability (HI = 1 or Risk = 105). Only in a worst-case scenario in which children who use urban gardens as recreational areas also eat the produce grown in them would the risk exceed the limits of acceptability.	SFS
Jongwe, 2014 [41]	Gweru City, Zimbabwe, Sub-Saharan Africa	Low	Household	n=150 households	Not specified	To assess the extent to which urban household food insecurity is mitigated by UA activities.	Quantitative, Cross-sectional	Questionnaires	Food security, cost Savings	Positive	UA practicing households were more food-secure than non-practicing households. UA participating households consumed more energy than non-UA participating households. 52.9% of the UA-participating households being foodsecure, compared to 47% from the non-UA-participating households. The mean percentage food expenditure for non-UA-practicing households is greater than that of UA-practicing households.	FS, ICE

Kaiser, 2015 [121]	Cleveland and Columbus, OH, United States, North America	High	Community	n=67 focus group participants	Not specified	To characterize the perceived risks of urban agriculture by residents.	Mixed methods study	Focus groups and soil samples analysis for detection of pathogen	Perception of risk associated to UA	Challenges	Study participants were acutely aware of potentially hazardous contaminants such as lead. Residents expressed the need for clearness regarding soil quality and gardening practices in their neighborhoods to consume food grown in these urban areas.	SFS
Kim, 2014 [79]	Wonju, South Korea, East Asia and Pacific	High	Community	n=246 individuals (Children)	School gardening (Institutional)	To assess the effectiveness of a school gardening program to promote positive social relationships among elementary school students.	Quantitative, before and after survey with control group	Questionnaire	Peer relation, peer status, and sociality	Positive	The results revealed the school gardening brought about meaningful differences in both persistence of friendship and adaptability between friends, which were subcategories of peer relationships, in the experimental group. There were also significant improvements in sociality and its various subcategories, especially in law-abiding and collaboration. In the control group, there was no significant change in peer status. On the other hand, in the experimental group, there was significantly a greater increase in peer status after the school gardening program.	SCN
Kortright, 2011 [55]	Toronton, ON, Canada, North America	High	Individual and Community	n=23	Home gardening	To explore the contribution of household food growing to community food security.	Qualitative, Grounded theory	In-depth interviews	Characteristics of gardeners participants and the contribution of residential-level food production to food security	Perceived benefits and challenges	The most significant impact of home food gardening on food security found was its ability to enhance the accessibility and nutritional value of the diets of the gardeners interviewed. A third of the gardeners interviewed did grow a substantial quantity of fresh produce. Most universally, the gardeners saw their gardens as a place apart from their daily lives that they found to be an important source of relaxation and way to let go of stress. Gardeners strengthened their relationship with several different neighbors through exchanges of food and talk about the garden. The study has also identified some concerns from the participants such as the presence of lead and other heavy metals in garden soils.	FS, HW, SFS, SCN
Kouamé, 2017 [15]	Yamoussoukro, Côte d'Ivoire, Sub-Saharan Africa	Middle	Individual and Household	n=492 households, 14% female 86% male	Urban farming	To assess health risk of waste water use in urban farming.	Quantitative, Cross-sectional and Risk assessment	Water and vegetables samples were analyzed, questionnaires were administrated to farmers and households. Infection risk from E. coli and G. lamblia pathogen was assessed.	Health risk	Adverse	AU practices increased the microbiological exposure risk of the two targeted groups of individuals—urban farmers and the inhabitants of an average household. However some sites posed greater risk than other. The probability to ill (Pill) from salad consumption is estimated at 1.0% for G. lamblia and 23.2% for E. coli O157:H7. But, for station 2, Pill from salad consumption was 0 for both pathogens. In the other stations is ranged from 0.0 to 23.2% for E. coli O157:H7, and from 0.0	SFS

											to 1.1%, for G. lamblia. The results showed that the annual risks of infection from farming activities and salad vegetable consumption were higher than the tolerable limit of risk defined by the World Health Organization.	
Lente, 2012 [110]	Accra, Ghana, Sub-Saharan Africa	Middle	Individual		Urban farming	To assess heavy-metal contamination in irrigated urban vegetable farming in Accra.	Quantitative, Risk assessment	Irrigation water, soil and plants tissue samples were analyzed, health risk was assessed.	Health risk	Neutral	Metal intake levels obtained from this study were all below their critical reference values. Health risk assessments done show that normal consumption of the different vegetables poses no risk from heavy-metal intake since daily rates and the hazard indices obtained were all below the risk level, but reached the threshold for a diet including all analyzed vegetables.	SFS
Litt, 2015 [80]	Dever, CO, United States, North America	High	Individual and Community	n=469 individuals (59,3% gardeners and 40,7% non gardeners) n=92 neighborhoods Average age 46.1	Community gardening	To elucidate the more proximal outcomes related to gardening and the direct and indirect pathways by which gardens influence self-rated health.	Quantitative, Cross-sectional	Face-to-face questionnaire surveys, and audits to objectively measure physical and social environments for each respondent	Self-rated health, fruit and vegetable intake, perceived neighborhood aesthetics	Positive	The strongest correlates of garden participation were social involvement and aesthetics, that means garden participation significantly predicted greater social involvement, more positive ratings of aesthetics. Based on the study results gardening also directly influenced improved fruit and vegetable intake. However it did not directly predict self-rated health over and above other model variables used in this study	N, SCN, NPE
Litt, 2011 [8]	Denver, CO, United States, North America	High	Individual	n=436 individuals (68% women 32% men)	Community and home gardening	To analyze the association between home and community gardening and fruit and vegetable consumption, controlling for demographic, neighborhood perception, and health covariates.	Quantitative, Cross-sectional	Face-to-face questionnaire surveys	Fruit and vegetable consumption	Positive	People who participated in community and home gardens reported higher levels of fruit and vegetable consumption than did nongardeners. 56% of community gardeners consumed fruits and vegetables at least 5 times per day, compared with 37% of home gardeners and 25% of nongardeners. A larger percentage of community gardeners and home gardeners than of nongardeners consumed the recommended amount of fruits and vegetables per day.	N
Martin, 2017 [68]	Marseille, France, Europe and Central Asia	High	Household	n=21 survey participants n=17 interviewees	Community gardening	To test the hypothesis that, in poor neighborhoods, community gardeners will have larger supply of healthy food, especially fruit and vegetables, than non-gardeners.	Mixed methods study	Face-to-face administered questionnaire, semi-structured interviews, and household food supply records	Gardeners' monthly household food supplies, aspirations and dietary practices	Perceived benefits	The learning process generated relationships and interpersonal exchanges that enhanced the social and convivial links sought by the gardeners. The gardens provided a way for women to express personal preferences, tastes, and cultural attachments. Interviews also revealed that gardening was considered as an important vector of self-esteem and strengthened the social environment of gardeners.	FS, HW, SCN

Matthys, 2006 [111]	Man, Côte d'Ivoire, Sub-Saharan Africa	Middle	Household	n=112 households	Urban farming	To identify risk factors for malaria among urban farmers and their families in a medium-sized town of Côte d'Ivoire, and to investigate whether the prevalence and intensity of Plasmodium falciparum infections are associated with the distance between specific human-made water bodies and the location of farmers' houses.	Quantitative, Cross-sectional	Questionnaires were administered, blood samples were analyzed	Risk factors for malaria	Adverse	Prevalence of P. falciparum was 32.1%. In children < 15 years of age, risk factors for a P. falciparum infection included living in a specific agricultural zone, close proximity to permanent ponds and fish ponds, periodic stays overnight in temporary farm huts, and low socioeconomic status. Specific crop systems and specific agricultural practices may increase the risk of malaria in urban settings.	SFS
Maxwell, 1998 [124]	Kampala, Uganda, Sub-Saharan Africa	Low	Household	n=360 households	Urban farming	To analyze the association between UA and the determinants of the nutritional status of children under five in Kampala	Quantitative, Cross-sectional	Survey questionnaire were administered, children were weighted and their health information record were collected	Nutritional status, dietary adequacy	Positive	Urban agriculture has a positive, significant association with higher nutritional status of children. the nutritional status of children in farming households is significantly higher than children in non-farming households. Among lower-socioeconomic status households, there is a significantly higher prevalence of moderate to severe malnutrition among children from non-farming households than among farming households.	N
Meenar, 2012 [56]	Philadelphia, PA, United States, North America	High	Community	n=46 surveys n=20 interviews	Community gardening and Urban farming	To examine the role of urban agriculture (UA) projects in relieving food insecurity in lower income neighborhoods of post-industrial U.S. cities, using Philadelphia as a case study.	Qualitative	GIS, survey, field observations, and interviews	Characterics of food producers and produce recipients, perceptions on gardens accessibility, social exclusion perception	Perceived benefits and challenges	The primary recipients of food produced through UA are lower- and middle-income households. About 18 percent of survey respondents' UA projects primarily distribute produce to food cupboards. Income from sale of produce varies from USD 150 per week to USD 4,000 in a year. However, some UA projects come up short in encouraging community involvement and overall longevity, some people feel themselves excluded.	FS, SCN, ICE
Megson, 2011 [112]	Rochedale, England, United Kingdom, Europe and Central Asia	High	Individual	Adults and Children	Allotment gardening	Health risk assessment to allotment users from dioxins and furans in allotment soil.	Quantitative, Risk assessment	Questionnaire administered and an open evening was held. Soil samples analysis from 8 allotment gardens, and human health risks assessment	Health risk	Adverse	In the adults scenario the consumption of site grown eggs contributed to around 94–97% of the total exposure. In the child scenario the consumption of site grown eggs contributed to around 92–96% of the total exposure. The assessment using CLEA (UK standard human health risk estimation) alone did not provide enough evidence to indicate significant possibility of significant harm (SPOSH) across the entire allotment site. However, when the likely exposure from the soil was combined with potential exposure from consumption of site laid eggs, the results indicated that the potential risks could constitute SPOSH.	SFS

Milligan, 2004 [89]	Carlisle, England, United Kingdom, Europe and Central Asia	High	Individual	n= 19 Older Adults (32% female 68% men)	Allotment gardening	To examine how communal gardening activity on allotments might contribute to the maintenance of health and well being amongst older people.	Qualitative, Ethnography	Focus group, semi-structured interviews and weekly diaries	Meaning of the gardens to the participants	Perceived benefits	The gardens were seen as sites for reflection. They allow participants to develop social network, feelings of peace and tranquility , provide natural landscape for new hobbies and social interactions. They also facilitate the development of a peer group that worked communally, sharing knowledge and skills and benefiting from enhanced social interaction.	HW, SCN
Milliron, 2017 [103]	Winston-Salem, NC, United States, North America	High	Individual	n= 152 individuals (patients) n=30 individuals (volunteers) n= 20 individuals (staff support)	Community gardening	To conduct a process evaluation of a community garden program at an urban medical clinic and estimate garden volunteer satisfaction.	Mixed methods study	Questionnaire survey and 3 open ended questions	Fresh food consumption perception, physical activity perception	Perceived benefits	Volunteers reported eating more fresh food, being more physically active, learning about gardening, feeling more involved in the neighborhood. 40% of the health care providers reported using the garden for patient education purposes.	N, HW, EE
Mirei, 2013 [69]	Kisumu municipality, Kenya, Sub-Saharan Africa	Middle	Household	n=194 individuals	Urban farming	To assess the role of urban agriculture in income, employment and food supply.	Mixed methods study	Structured questionnaire, focus group discussion and field observation.	Land size, type of farming activities, wage rate in UA, income	Positive and motivations	Most of the surveyed urban farmers engage in subsistence farming with most of the produce (95%) directly consumed by the household. Most of the commercial farmers engage in farming to supplement their income from wage employment. The income from urban agriculture forms an important aspect of the livelihood support system, even subsistence farming becomes very significant for a household earning a minimum wage of US\$ 8.6 per month. The results of the study shows that on average 2 members of the urban farming households engage in agriculture.	FS, ICE
Miura, 2003 [70]	Davao City, Philippines, East Asia and Pacific	Middle	Individual	n=152 individuals (mothers)	Home gardening	To examine the outcomes of a community-based approach including promotion of home gardening and a diversified dietary practice.	Mixed methods study	Structured questionnaire, 7-day household food record, and focus groups	Dietary diversity, food consumption, dietary practices	Neutral	Home garden produce replaced carbohydrate-rich food. It contributes to more frequent consumption of vegetables and fruit. Participants reported frequent utilization of home garden produce, and percapita vegetables and fruits cost per day increased. However, the study concludes that it could not identify whether or not home gardening improved the diet of the participants.	FS, N
Mkwambisi, 2011 [71]	Lilongwe and Blantyre, Malawi, Sub-Saharan Africa	Low	Household	n=330 households	Crops production	To assess urban agriculture's total contribution to food security.	Mixed methods study	Questionnaire were administrated, interviews and focus groups	Food consumption, income, employment	Positive	Households surveyed produced an average of 228 kg/capita of cereal which is above the 181 kg/capita that the Government of Malawi recommends as an adequate food budget. The study found that low-income and female-headed households consumed 34.3% and 11 % of the total harvest, respectively. This was less than the high-income and male-headed households who consumed over 75% and 79%of	FS, ICE

											their total harvests respectively. Female-headed households obtained more income than male-headed households from urban agriculture. The study found that 17% of all households interviewed had worked for a wage on some sort of urban agriculture enterprise.	
Mlozi, 1996 [72]	Dar es Salaam, Tanzania, Sub-Saharan Africa	Low	Individual and Household	n=29 individuals	Animals and crops production	To examine both the economic contribution and the negative side-effects of urban agriculture.	Mixed methods study	Questionnaire	Food consumption, income, environmental damage awareness	Positive and challenges	Households consumed about 11% of their daily produce. The profit each respondent made from agriculture was about seven times higher than a senior official's annual salary of 240 000 shillings (US\$500), and ten times higher than the annual minimum wage income of 72 000 shillings (US\$150). The majority of the respondents (73,7 %) were aware that animals damage the urban environment.	FS, NPE, ICE
Moyo, 2013 [57]	Bulawayo, Zimbabwe, Sub-Saharan Africa	Low	Household	n=204 individuals	Urban farming	To examine the role and contribution of urban agriculture towards household food security, employment creation and income generation among low-income working class and urban poor households in Bulawayo townships.	Qualitative	In-depth and semi-structured Interviews	Farmers perceived benefits, constraints and obstacles for UA	Perceived benefits, challenges	A majority of on-plot farmers (79) indicated that they were producing enough brassica oleracea varieties for household consumption. They were thus not buying any variety of this vegetable on the open formal or informal market as their own production was enough to meet household subsistence requirements. Brassica oleracea generated between \$50 to \$200 / farming season. Land tenure insecurity was the major challenge of the UA practitioners.	FS, NPE, ICE
Murray, 2011 [16]	Montréal, QC and London, ON, Canada, North America	High	Individual		Community gardening	To explore the effect of varying organic matter content on the potential human health risk of consuming vegetables grown in urban garden soils.	Quantitative, Risk assessment	Soil and plants tissue samples analysis and human health risk assessment	Health risk	Adverse	The consumption of lettuce and green bean pods grown in some urban gardens posed a potential human health risk due to unacceptably high concentrations of cadmium or lead. This study demonstrated that three vegetables grown in contaminated soils accumulated metals to varying levels. However, the edible tissues with the highest concentrations of metals did not necessarily come from plants grown in the most contaminated soil.	SFS
Nabulo, 2010 [113]	Kampala, Uganda, Sub-Saharan Africa	Low	Individual	Children and adults	Vegetable gardens	To assess the association between sources of trace metal contamination and uptake by plants; and quantify the potential risk to children and adults of consuming leafy vegetables grown in urban agriculture.	Quantitative, Risk assessment	Soil and vegetable leafy samples were analyzed and health risk was assessed.	Health risk	Adverse	The risk to human health, expressed as a 'hazard quotient' (HQM), was generally greatest for Cd, followed successively by Pb, Zn, Ni and Cu. Values for HQM were much greater for children than for adults.	SFS

Ngome, 2012 [42]	Buea, Cameroon, Sub-Saharan Africa	Middle	Household	n= 200 gardeners (100 female, 100 male)	Urban gardening	To understand gender and the reasons for urban farming, access to land, crop choice, access to certain inputs, the division of labour, and the benefits of urban farming.	Quantitative, Case study	Questionnaire survey were administrated.	Food supply, income	Mixed (Positive and Adverse)	Almost 66% of the gardeners considered their own food production as the most important source of calories and protein. a fifth of all gardeners the income objective was the sole reason for growing crops. Quite a number of gardeners mentioned theft as a serious setback to their activities.	FS, ICE
Northrop, 2013 [101]	Birmingham, AL, United States, North America	High	Individual	n=20 individuals	Community gardening	The purpose of this study was to assess the reasons community gardeners at Jones Valley Urban Farm in Birmingham, Alabama participate in the community garden program, as well as to explore the potential impacts such participation has on the members' health, community, and diet.	Qualitative	Focus groupe	Reasons for participating in CG and perceptions of impacts resulting from CG participation	Perceived benefits and motivations	Several gardeners specifically expressed a desire to save money by growing their own vegetables. Gardeners spoke of the produce grown in their plots as having a particular taste that, for many, was a "good motivator to get out and grow your own food. The "community" aspect of community gardening was particularly valued by the garden's members and presented in multiple ways. The act of gardening was described as a stress-relieving activity that provided "a release" and served as a form of "therapy." Several gardeners specifically expressed a desire to save money by growing their own vegetables as their motivation.	N, HW, ICE
Ogunkunle, 2016 [114]	Ilorin, Nigeria, Sub-Saharan Africa	Middle	Individual	Adults	Urban horticulture	To assess the contamination level of trace metals as well as the health risk, associated with dietary intake of contaminated vegetables, in adult sub-population.	Quantitative, Risk assessment	Soil and vegetable samples were analyzed and health risk assessed.	Health risk	Adverse	The estimated daily intakes (EDI) of Cu and Pb through vegetable consumption were far below the recommended tolerable daily intakes (TDI) and the hazard quotient (HQ) values were within the safe zone for the adult population. In contrast, the EDI of Cd for the vegetables was several folds greater than the TDI, thus greatly contributing to a high hazard index (HI>1.0), observed in all vegetables. Therefore, risk assessment of trace metal ingestion through consumption of the vegetables in the adult sub-population depicts serious health hazards with Cd, mainly contributing to vegetable contamination in the studied area.	SFS
Oladeji, 2008 [43]	Ibadan city, Nigeria, Sub-Saharan Africa	Middle	Individual	n=198 individuals	Urban farming	To assess the personal characteristics of urban farmers, identify the types of crops grown, livestock reared, type of location, and reason for practicing urban farming.	Quantitative, Cross-sectional	Questionnaire	Food supply, cost saving, income, and health risk perception	Mixed (Positive and Adverse)	50% and 47% of the respondents practice UA to supply family income and minimize food expensive respectively. UA activities contributes to 37% hunger reduction. However, the findings also show that malaria was the most perceived health problem associated with urban agriculture. Other farmers reported other health problems such as headache and unpleasant odors from livestock.	FS, HW, ICE

Olivier, 2017a [90]	Cape Town, South Africa, Sub-Saharan Africa	Middle	Individual and Community	n=59 individuals	Community, home and institutional gardening	To show how urban agriculture develops different forms of social capital and the effect on strengthening family relations, community interaction and social cohesion.	Qualitative	Interviews and focus group	Personal, social, physical and psychological benefits of UA	Perceived benefits	Gardeners value UA as a component of their livelihoods; for building relationships, improving self-esteem and creating safe spaces. Participants thought they have more variety in their diet and ate vegetables that they never thought of eating before. Gardening provides peaceful environment, social capital is fostered.	HW, SCN, EE
Olivier, 2017b [58]	Cap Town, South Africa, Sub-Saharan Africa	Middle	Individual	n=60 individuals (59 cultivators and 1 NGO leader)		To look at the ways in which urban agriculture empowers women on the Cape Flats, a region of Cape Town where urban agriculture is supported by nongovernmental organisations (NGOs).	Qualitative	In-depth interviews and focus group	Social capital as well as other physical and economic opportunities that UA facilitated	Perceived benefits	The findings indicate that social capital is one of the most important contributions urban agriculture makes towards sustainable livelihoods for women in the study area. Urban agriculture provided a valuable source of fresh produce, which enabled women to exercise greater control over the quality of food they provided for their family. Women made money by selling surplus to passers-by and by growing crops specifically to sell through NGOs. For some women cultivation provided an escape from mundane urban life, creating a space in which they are no longer defined primarily as a mother or wife, but are simply themselves. Cultivation activities facilitate local networks, forge linkages with power holders and empower women through employment in senior leadership.	FS, SCN, ICE
Panneerselvam, 2014 [73]	Coimbatore, India, South Asia	Middle	Household	n=30 households members	Urban farming	To study socio-economic and environmental benefits of households practicing urban farming at Coimbatore.	Mixed methods study	Face-to-face interview with a semi-structured questionnaire	Benefits of urban farming, social issues, and economical status	Positive	Household food expenditure (especially on purchase of vegetables) were reduced by adopting UA. 30% of the farmers experienced 20-40% reduction in food expenditure. All farmers mentioned UA reduce stress and improved access to healthier food. 87% of the farmers agreed that relationship with neighbor improved because of UA, 83% said their social network increased.	FS, HW, SCN, ICE
Park, 2016 [98]	Seoul, South Korea, East Asia and Pacific	High	Individual	n=24 gardening participants n=26 control	Horticultural therapy	To assess physical and psychological benefits of gardening intervention in elder women.	Quantitative, Quasi-experimental	15 session gardening intervention, health assessment, and questionnaire on physical activity	Body composition, physical functional ability, hand function ability, cognitive ability, depression, and sociality	Positive	Women in the intervention group exhibited improved muscle mass, aerobic endurance, hand dexterity, cognitive ability and decreased waist while control group exhibited decreased muscle mass and depression. Intervention group reported higher daily physical activity than the control group.	HW, L
Philander, 2016 [74]	Cap Town, South Africa, Sub-Saharan Africa	Middle	Household	n=83 participants (80% female and 20% male). 2 focus groups with n = 30	Urban food garden project	To assess the contribution of urban food gardens as a livelihood strategy for household food security and determine the livelihood outcomes of urban food gardens.	Mixed methods study	Close ended questionnaire, and focus groups	Food security perception, reasons for practicing UA	Perceived benefits and motivations	82% of the respondents indicated that the urban food gardens contribute to their household food security. The improvement of their health reflects as the most important benefit by 38% of the respondents.	FS, HW

Poulsen, 2017a [59]	Baltimore, MD, United States, North America	High	Community	n= 21 participants	Community farming and Commercial farming	To understand how different farming models balance civic and economic exchange, prioritize food justice, and create socially inclusive spaces.	Qualitative	In-depth interviews, unstructured participant observations	The degree to which urban farming aligns with the ideal of civic agriculture as a form of locally based agriculture linked to the social development of a community, and the strategies urban farmers use to put civic agriculture into practice.	Perceived benefits and challenges	Community farm prioritizes civic participation and food access for low-income residents, and strives to create socially inclusive space. The commercial farm focuses on financial sustainability rather than participatory processes or food equity, reflecting the use of food production as a means toward community development rather than propagation of a food citizenry. Both farms meet authentic needs that contribute to neighborhood improvement. Farmers are white; neighborhood is predominantly black, the study demonstrates how Baltimore's urban farmers understand their status as "outsiders".	FS, SCN
Poulsen, 2017b [60]	Baltimore, MD, United States, North America	High	Community	n=60 participants (34 adults 14 neighborhood leaders 12 farmers)	Urban farming	To elicit community perceptions regarding the functions and benefits of urban farming.	Qualitative	Semi-structured interviews	Neighbourhood perceptions regarding the functions and benefits of urban farming	Perceived benefits	UA provided gathering spaces for the neighbourhood and facilitated social interaction. Resident interviewees reported that such space encourages people to leave their homes and socialise, and allows neighbours to meet, ultimately building a greater sense of community and connectedness. Residents and neighbourhood leader interviewees viewed urban farms as a way of improving individual and community health in their neighbourhoods by providing physical access to food that is better tasting and more nutritious than other options. Interviewees of all types described farm produce as healthy, both because it provides a healthier option than the fast food restaurants that dominate the food landscape, and because they viewed it as more "natural" than supermarket produce.	FS, SCN, EE
Ratcliffe, 2011 [44]	San Francisco, CA, United States, North America	High	Individual	n=320 individuals	School gardening (Institutional)	To describe the effects of garden-based education on children's vegetable consumption.	Quantitative, Quasi-experimental pre-post intervention	Questionnaire	Education, vegetable consumption, vegetable intake diversity	Positive	Children increased the number of different vegetables that they correctly identified significantly more than those in the control group. Students in the garden group reported having tried significantly more varieties of vegetables than those in the control group.	FS, N, EE
Ruggeri, 2016 [45]	Milan, Italy, Europe and Central Asia	High	Individual	n=60 individuals (12% female and 88% male)	Urban gardening	To detect some peculiar features of Milan city gardeners, in order to highlight the motivations of their activity through an innovative and replicable approach based on multiple correspondence analysis	Quantitative, Case study	Questionnaire with qualitative variables	Motivations for gardening	Positive	Most of the respondents express the desire for healthier food and personal wellness as the driving reasons for practicing UG in the city. Gardening fosters community by strengthening relationships with other gardeners. 18% of respondents expressed satisfaction over the produce of gardens from an	FS, HW, SCN, ICE

						(MCA) and hierarchical clustering analysis (HCA).					economic point of view. A third of the respondents did claim to grow a substantial quantity of fresh produce, and some of them stated that they were self-sufficient in at least some foods through the harvest season.	
Salah Al-Heety, 2017 [115]	Baghdad, Iraq, Middle East and North Africa	Middle	Individual	Children and adults	Community gardening	To evaluate health risk of heavy metals in soils of urban community gardens of Baghdad City in Iraq.	Quantitative, Risk assessment	Soil samples were analyzed, non-carcinogenic and carcinogenic assessment were made	Health risk	Adverse	The results showed that the hazard quotient (HQ) of the different exposure routes of metals for children decreased in the following order: ingestion < dermal contact < inhalation. The results suggest that ingestion is the main exposure route that threatens human health. The Harzard index (HI) values for all metals were less than 1, indicating that there was no non-carcinogenic risk for children and adults. However, children have much more chance for non-carcinogenic risk compared to adults. The carcinogenic RI values of Cd, Cr and Ni for children and adults were above the threshold value indicating serious carcinogenic risk.	SFS
Salahu, 2005 [46]	Ibadan city, Nigeria, Sub-Saharan Africa	Middle	Household	n= 89 questionnaire respondents	Urban farming	To assess the food security of farming households.	Quantitative, Croos-sectional	Questionnaire survey were administrated	Food security	Positive	The study found association between protein and energy secured and involvement in urban farming.	FS
Saldivar-Tanaka, 2004 [61]	New York City, United States, North America	High	Community	n=43 individuals	Community gardening	To provide a description of the history, users, plants, activities, and problems of Latino community gardens in NYC.	Qualitative	Open-ended interviews and observations	Participants demographics, crops and planting practices, activities, and facilities, garden history, and issues facing the community garden, perception of the role of gardens in the context of community development, open space, and civic agriculture.	Perceived benefits	Gardens are seen as cultural and social neighborhood centers, where people go to meet with friends, family, neighbors, newcomers, and visitors. The most important role of Latino gardens appears to be in community development, they are also important as open space, and to a lesser degree as sites for food production. The gardens provide a place for social interactions in neighborhoods where social gathering places are often lacking.	FS, SCN, CC
Sanyé-Mengual, 2016 [91]	Barcelona, Spain, Europe and Central Asia	High	Community	n=25 stakeholders	Urban rooftop farming	To examine the promotion and inclusion of new types of urban agriculture through the practice of URF.	Qualitative	Semi-structured interviews, secondary data	Leisure, social capital, and cultural connection	Perceived benefits and motivations	Participants perceived UA more as a socially oriented activity and as a practice with healing and therapeutic goals for traditionally vulnerable groups in the city. Most UA-related stakeholders identified leisure and self-sufficiency as the drivers for current public and private horticultural experiences in Barcelona. Stakeholders identify further social benefits for community activities, such as community building. Respondents highlighted that URF would allow children to learn about the origins of the foods they consume and adults to become more conscious of	SCN, L, CC

											seasonal and quality products by participating in learning activities in buildings just around them in the city.	
Shinew, 2004 [81]	St Louis, MO, United States, North America	High	Individual and Community	n=180 individuals	Community gardening	To examine whether community gardens are perceived as spaces where people from different races can integrate.	Quantitative, Cross-sectional	Telephone interviews	Race and its relation to perceptions, motivations and benefits of CG	Positive	The participants believe that community gardens bring together people from different racial groups. Gardeners also agreed that community gardens brings together people who would not normally socialize together.	SCN
Simiyu, 2014 [75]	Eldoret, Kenya, Sub-Saharan Africa	Middle	Household	n=180 households (surveys) n=24 households (interviews)	Urban Crop Cultivation (UCC)	To examines men's and women's motives and needs in UCC.	Mixed methods study	Questionnaires and in-depth interviews	Motivations of urban crop cultivators (UCC)	Perceived benefits and motivations	Urban crop cultivators were motivated primarily by the need to enhance household food security and nutrition, but also to earn and/or save some income. Most prevalent crops was self-consumed by over 80% of the cultivating households. A smaller proportion of the households earned some income from selling crops. UCC is an important basis for women's participation in credit-based social networks.	FS, SCN
Smart, 2015 [76]	Kitwe, Ndola and Luanshya, Zambia, Sub-Saharan Africa	Middle	Household	n=679 households n=61 key informants	Not specified	To examine the significance of urban agriculture and some of the key issues faced by producers from a range of socio-economic groups.	Mixed methods study	Questionnaire and interviews	Employment, food consumption, income, importance of UA in the livelihoods of residents	Perceived benefits	The survey established that in 51% of surveyed households considered UA as an important source of employment. Nearly a third of respondents are selling produce and, by implication, extending their household cash incomes. In 39% of the approximately 100 households selling produce, UA was the primary source of income, whilst for 44% it was a key secondary source of income. Hence, for nearly 30% of reporting households UA represents a key source of income. Interviews revealed that households continued to practice UA out of fear of future potential job losses.	FS, ICE
Smith, 2014 [47]	Madison, WI, United States, North America	High	Household and Community	n=36 individuals	Community, home, and school gardening	To explore, define, and map the market value of UA in the Madison, Wisconsin, Urban Area.	Quantitative, Cross-sectional	Roadside survey, daily harvest record	Market value of produce, caloric value, contribution to diet	Neutral	The 48,184 gardens in the Madison Urban Area contributed a gross agricultural product of US\$9.4 million in 2010. The study found that the food is making only a small contribution in terms of the community's overall food security. It contributes to 0.8 % of total food needs or 0.14 % of total caloric needs, and a substantial 2.4% of household food expenses on average.	FS, N, ICE

Soga, 2017 [82]	Nerima, Tokyo, Japan, East Asia and Pacific	High	Individual	n = 332 Adults (165 gardeners 167 non gardeners) 31,9% female 68,1% male. Average age 61	Allotment gardening	To quantify the effects of allotment gardening on physical, psychological and social health.	Quantitative, Cross-sectional	General health with one single question, 10-item symptom checklist to measure subjective health complaints, body mass index (BMI) through self-reported height and weight. 12-item General Health Questionnaire to measure mental health, Social cohesion with the Social Cohesion and Trust Scale, and comparison between gardeners and non-gardeners	Health perception, subjective health complaints, body mass index (BMI), mental health, and social cohesion	Positive	Gardeners, compared to non gardeners perceived better general health, mental health, and social cohesion. They also reported less health complaints compared to non gardeners but BMI did not differ between gardeners and non gardeners.	HW, SCN
Spees, 2015 [92]	Columbus, OH, United States, North America	High	Individual	n=28 focus group participants	Urban gardening on University campus (Institutional)	To study the perceptions of personal health behavior change in cancer survivors following participation in an urban gardening program.	Qualitative	Focus group, survey	Food security status with the Economic Research Service Six-Item Short Form Food Security Survey Model, perceptions of health behavior of cancer survivors, demographics, experiences on the gardening program	Perceived benefits and challenges	Many participants shared that because of the garden, they were eating a greater quantity of fresh produce and preparing it in novel ways. They were also exposed to several new vegetables. Participants also agreed that gardens improved their emotional and mental health, enhanced community support. However, the participants reported challenges in harvesting. 4 themes emerged from the study 1) greater dietary intake of produce; (2) improved mental and physical health; (3) enhanced sense of community and social support; and (4) challenges to long-term maintenance.	N, HW, SCN, NPE
Spliethoff, 2016 [116]	New York City, NY, United States, North America	High	Individual and Household	Children and adults	Community gardening	To estimate Pb intakes using deterministic and probabilistic methods for gardeners and household members.	Quantitative, Risk assessment	Surveys and soil, vegetables, chicken eggs data from previous study	Health risk	Adverse	Most central-tendency Pb intakes were below provisional total tolerable intake (PTTI) levels. High-contact intakes generally exceeded PTTIs. 40% of children and 10% of gardeners exceeding PTTIs. However, Children's exposure came primarily from dust ingestion and exposure to higher-Pb soil between beds. Gardeners' Pb intakes were comparable to children's (in µg/d) but were dominated by vegetable consumption.	SFS
Stoler, 2009 [117]	Accra, Ghana, Sub-Saharan Africa	Middle	Household	n=3164 women	Irrigated Urban agriculture	To examine the relationships between self-reported malaria and both household characteristics and proximity to sites of UA.	Quantitative, Cross-sectional	Household surveys were administrated and n= 1,328 completed a comprehensive medical and laboratory examination	Self reported malaria	Adverse	The study suggests that there is an elevated prevalence of self-reported malaria within 1 km of UA sites. Self-reported malaria are significantly higher for women living within 1 km of UA than those living within 1 km of the river system, but not beyond this threshold.	SFS

Taylor, 2014 [77]	Chicago, IL, United States, North America	High	Household	n=31 individuals	Home gardening	To study urban home food garden (UHFG) and its contributions to urban systems.	Mixed methods study	In-depth interviews, participant observation, survey, soil sample analysis	Patterns and processes, garden-centered social networks and the meaning of garden-related practices from the perspective of the gardener	Perceived benefits and challenges	Some informants reported that their gardens made a substantial contribution to their household food budgets. Home gardens contribute to local food systems by making culturally acceptable foods readily accessible. The frequent cultivation of garden soil that we observed may therefore result in increased exposure of gardeners and their families to lead in the form of contaminated dust or soil particles directly ingested or adhering to garden produce.	FS, SFS, CC
Teig, 2009 [93]	Denver, CO, United States, North America	High	Community	n=67 respondents n=29 gardens sites	Community gardening	To examine the social processes that might explain the connection between gardens, garden participation and health.	Qualitative	Semi-structured interviews	The meaning of gardens, garden practices garden-neighborhood interactions, and the impacts of community gardens on the broader neighborhood and city environment.	Perceived benefits	Gardeners frequently described gardens as a place to connect across different cultural backgrounds, to feel a part of a community, to connect with family and neighborhoods and a place for social activism. Many mentioned opportunities for donating surplus harvest to organizations and populations without access to fresh produce. Respondents spoke about the garden as a place where diverse people come together to form a community.	SCN
Tembo, 2013 [62]	Cape Town, South Africa, Sub-Saharan Africa	Middle	Household	n=15 individuals	Community gardening	To study how community gardens intended outcomes were conceptualised by programme stakeholders, and how programme implementation was perceived by the intended beneficiaries.	Qualitative	Participant observation, interviews, and focus group discussions.	Gardeners perception on gardening projects	Perceived benefits	Gardeners considered the provision of food for their households as the major change that the programme introduced in their lives. They achieved some savings on household food purchases, and improved their nutrition somewhat. The main achievement of the two gardening projects was in combating hunger, by enabling the gardeners to provide food for their households. The gardeners reported that they have learnt to eat healthily. The gardening projects also provide supportive social and recreational spaces for the gardeners.	FS, SCN
Thassananakajit, 2016 [48]	Bangkok, Thailand, East Asia and Pacific	Middle	Household	n=59 individuals	Vegetable gardens	To study personal data, economic situations, knowledge and attitude toward the urban vegetable productions of growers in Bangkok.	Quantitative, Cross-sectional	Online questionnaire	Knowledge about urban vegetable production, attitudes towards urban vegetable production, and food consumption	Positive	The research found out that the main rationale for practicing urban vegetable was to provide vegetables for household consumption and safe from toxins. Almost all of the respondents believed (agreed 27%, and strongly agreed 54.2%) that practicing urban vegetable can provide short milestone of vegetables for cooking, 50.8 percent strongly agreed that practicing urban vegetable can provide many types of vegetables for household consumption. Finally, 40.7 percent, participants believed that practicing urban vegetable can create the	FS, N, SCN

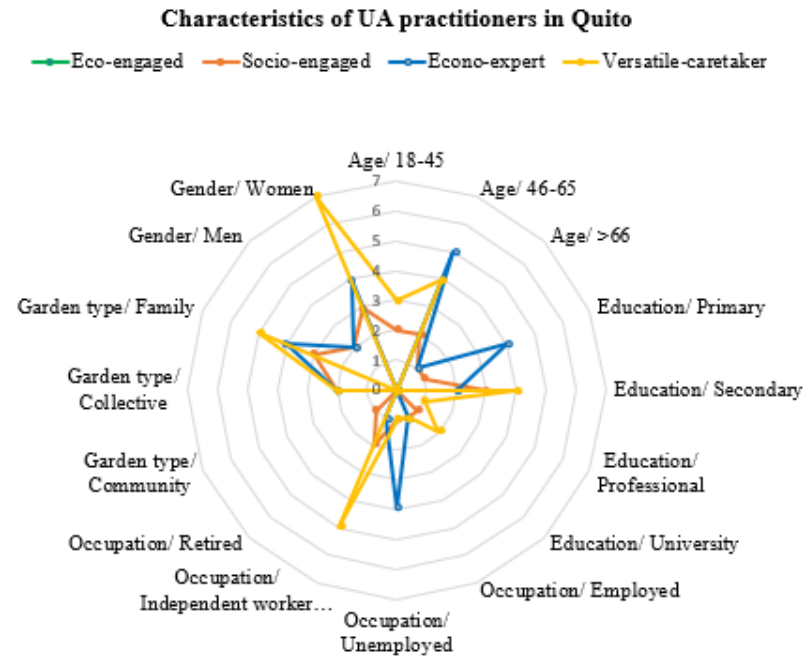
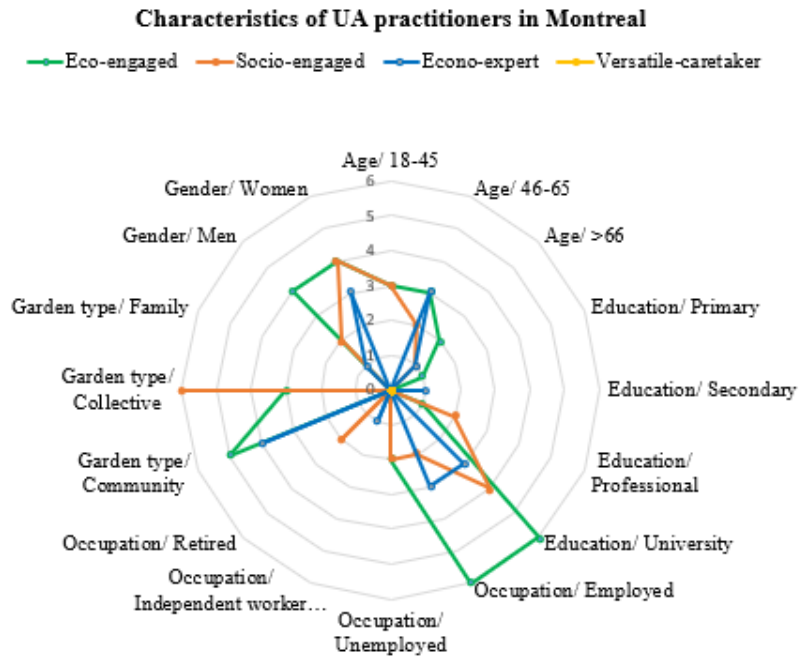
											relationship between household members, communities.	
Torres, 2017 [102]	Paris, Pré-Saint-Gervais, and Montreuil, France, Europe and Central Asia	High	Individual and Community	n=30 individuals	Community gardening	To address the issue of how French Community Gardens relate to environmental stewardship.	Qualitative	Participant observation and semistructured interviews	Gardeners motivations, individual and collective processes associated with gardeners' experiences	Perceived benefits and motivations	Helping or caring for the environment was one of the motivations mentioned by gardeners. Ten out of the 30 interviewed gardeners declared that their first motivation for participating in the garden was to deal with a disturbance, stress, or shock in their personal life. Gardening was perceived as providing happy breaks in nature, in a specific moment of their lives.	HW, NPE
Uzu, 2014 [118]	Cotonou, Benin, Sub-Saharan Africa	Low	Individual	Men and women	Urban farming	To determine the global influence of the polluted environment (atmosphere, soil, and irrigation waters) on vegetable quality in a large urban-farming area.	Quantitative, Risk assessment	Soil and plants samples were analyzed for the detection of Pb, Cd, Sb, As, Cu, and Zn. In vitro Gastric bioaccessibility was obtained. The dietary intakes of Pb, Cd, Sb, and Zn were estimated through consuming a normal serving per day of leafy vegetables.	Health risk	Adverse	Concerning the edible parts of the vegetables, the main bioaccessible elements were Cd>Sb>Pb. Consumption of vegetables from Houéyiho market garden is not free of risk for human health. The target quotient hazard (THQ) of the metals values for men and women surpassed 1 for Pb and Sb for both lettuce and cabbage leaves.	SFS
Veen, 2016 [96]	Zutphen, Almere, Leeuwarden, Amsterdam, Rotterdam, and Assen, Netherlands, Europe and Central Asia	High	Individual and Community	n=300 individuals (n=237 questionnaires, n=63 interviewees)	Community gardening	To study seven community gardens with varying organisational designs and objectives, and investigate the extent to which these influence the enhancement of social cohesion.	Mixed methods study	Semi-structured interviews, questionnaires	Number, strength of contacts, the existence of mutual help, role of cultivation and vegetables	Perceived benefits and motivations	Results show that participants of all seven gardens know and speak to others. Certain designs attract participants with certain motivations: neighbourhood-bound gardens and gardens with communal plots attract gardeners interested in the social aspects of gardening; non neighbourhood-bound gardens and gardens with individual plots attract gardeners interested in harvest and cultivation. CG contribute to the development of social cohesion – even if people are not particularly driven by social motivations.	SCN
Wakefield, 2007 [5]	Toronto, ON, Canada, North America	High	Individual and Community	n= 13 interviewees, n=55 focus group participants	Community gardening	To identify the health impacts of community gardening.	Qualitative	Participant observation, focus groups and in-depth interviews.	Perceptions about the health benefits of CG, perceived problems associated to CG	Perceived benefits and challenges	Participants perceived improved nutrition, increased physical activity and improved mental health. They also highlight contribution to healthy living, improving relationships among people, increasing community pride. On the other hand, they mention challenges associated to CG	N, HW, NPE, SFS

											such as insecure land tenure, violence perception and food safety concerns.	
Warming, 2015 [119]	Copenhagen, Denmark, Europe and Central Asia	High	Individual	Children and women	Urban gardening	To evaluate whether the intake of trace elements through urban gardening constitutes a health risk to urban gardeners.	Quantitative, Risk assessment	Soil and vegetable samples from three representative gardens were analysed for concentrations of selected trace elements (As, Cd, Cr, Cu, Ni, Pb, and Zn). The risk due to urban gardening was evaluated for each trace element, by taking into account both the consumption of urban vegetables as well as the unintentional ingestion of urban soil and dust.	Health risk	Adverse	Consumption of urban vegetables from contaminated soils does not result in a risk, whereas unintentional soil ingestion appears to pose a health risk.	SFS
Yeudall, 2007 [49]	Kampala, Uganda, Sub-Saharan Africa	Low	Household	n=296 households (farming, n=235 and non farming, n=61)	Urban farming	To examine the impact of sociodemographic and farming variables on the household food security and nutritional security of an index child aged 2 to 5 years.	Quantitative, Cross-sectional	Survey questionnaire, household food-security index; 24-hour recall; fingerprick blood samples, correlation and regression analysis	Dietary diversity, nutritional status, household food security, hemoglobin, serum retinol and C-reactive protein	Positive	Household food security score was significantly positively correlated with the number of tropical livestock units. Children from farming households consumed significantly higher proportions of homeproduced foods than children from nonfarming households.	FS, N
Yusuf, 2015 [50]	Ibadan city, Nigeria, Sub-Saharan Africa	Middle	Household	n=110 households (15.5% women 84.5% male)	Urban farming	To investigate the effect of urban household farming on food security status in Ibadan metropolis, Oyo State, Nigeria.	Quantitative, Cross-sectional	Structured questionnaire were administered to participants	Food security	Positive	The study found that the majority of the farmers were not food secured. However, the profile of the household size by food security incidence showed that 66.1% of urban farming households in crop and livestock enterprises with household size of 1–3 persons were food secure.	FS
Zick, 2013 [10]	Salt Lake City, UT, United States, North America	High	Individual	n=198 individuals	Community gardening	To examine the association of participation in community gardening with healthy body weight.	Quantitative, Quasi-experimental with control groups	Self-reported height and weight from License Driver Division and Utah population database, comparison between 3 groups (neighbors, siblings, spouses)	BMI, obesity risk	Positive	Community gardeners have lower BMIs than do same-gender and same-aged nongardeners living in their neighborhoods. The estimated BMI reductions in the multivariate analyses were –1.84 for women and –2.36 for men. There was also a significant reduction in overweight and obesity risk for women gardeners compared with their sisters (–1.88) and men community gardeners compared with their brothers (–1.33).	HW

CC: Cultural connection, EE: Education and empowerment, FS: Food security, HW: Health and well-being, ICE: Income, cost savings and employment, L: Lifestyle, N: Nutrition, NPE: Natural physical environment, SCN: social and community network, SFS:

Sanitation and food safety

Annexe A-2 Reproduction de la figure de la section 3.5.2



Annexe B — Outils de collecte de données sur le terrain

Annonce de recrutement des participants



UNIVERSITÉ
LAVAL

Recrutement de participants et participantes pour projet de recherche

Bonjour,

Mon nom est Pierre Paul Audate, étudiant au doctorat à l'université Laval, Canada sous la direction du professeur Alexandre Lebel.

J'aimerais vous inviter à participer à un projet de recherche dans le cadre d'une thèse de doctorat. Le projet a pour titre : Motivations individuelles dans la pratique de l'agriculture urbaine dans les quartiers moins favorisés : trois cas de ville de différent contexte socioéconomique. Le projet de recherche vise à caractériser les motivations des pratiquants de l'agriculture urbaine dans les milieux moins favorisés. Votre participation à cette recherche consiste à répondre à des questions qui vous seront posées dans un questionnaire d'une durée de 15 minutes et une entrevue individuelle, d'une durée d'environ 45 minutes qui sera enregistrée. Les questions porteront sur les éléments suivants: votre situation actuelle, vos raisons de pratiquer l'agriculture urbaine, les avantages et les inconvénients perçus de la pratique de l'agriculture urbaine.

Des participants intéressés seront aussi invités à participer à un groupe de discussion (optionnel) d'une durée de deux heures. Cette activité permettra de discuter des questions en groupe sur l'histoire de l'agriculture urbaine dans le quartier, la typologie et les motivations des pratiquants de l'agriculture urbaine. Cette activité permettra aussi au chercheur de valider certaines informations préliminaires obtenues dans les entrevues.

La participation est volontaire et n'entraîne aucune conséquence sur votre travail ou votre relation avec l'organisation qui vous appuie dans vos activités d'agriculture urbaine.

Pour Participer à l'étude vous pouvez me le confirmer au moment de la visite du chercheur dans votre quartier ou contacter par courriel ou téléphone

Pierre Paul Audate

Merci

Ce projet a été approuvé par le Comité d'éthique de la recherche de l'Université Laval :
N° d'approbation 2018-157 / 16-07-2018

Formulaire de consentement des participants



UNIVERSITÉ
LAVAL Formulaire de consentement

Avant votre participation à ce projet de recherche, nous vous demandons de prendre le temps de lire et de comprendre les renseignements qui suivent. Ce document vous explique le but de ce projet de recherche, ses procédures, avantages, risques et inconvénients. Nous vous invitons à poser toutes les questions que vous jugerez utiles à la personne qui vous présente ce document.

Pour les participants ne pouvant pas lire et écrire le consentement sera lu par le chercheur ou son représentant et le (a) participant (e) fera une croix sur l'espace de la signature du participant, de la participante.

Présentation du chercheur

Cette recherche est réalisée dans le cadre du projet de doctorat de Pierre Paul Audate, dirigé par Alexandre Lebel et Geneviève Cloutier de l'École supérieure d'Aménagement du territoire et de développement régional à l'Université Laval. Le projet est partiellement financé par les Fonds de Recherche Santé Québec (FRQS).

Nature et objectifs du projet

La recherche a pour but d'étudier les motivations des personnes à pratiquer l'agriculture urbaine dans un quartier moins favorisé d'une grande ville pour trois pays différents.

Déroulement du projet

Votre participation à cette recherche consiste à répondre à des questions qui vous seront posées dans un questionnaire d'une durée 15 minutes et une entrevue individuelle, d'une durée d'environ une heure qui sera enregistrée ou participer dans un focus groupe (optionnel) d'une heure. Les questions porteront sur les éléments suivants: votre situation actuelle, vos raisons de pratiquer l'agriculture urbaine, les avantages et les inconvénients perçus de la pratique de l'agriculture urbaine.

Avantages, inconvénients possibles liés à votre participation

Le fait de participer à cette recherche vous offre une occasion de réfléchir et de discuter en toute confidentialité, de vos perceptions sur les retombées et contraintes des initiatives d'agriculture urbaine dans le quartier.

Cette recherche ne représente aucun risque pour vous, votre activité ou votre relation avec l'organisation qui vous appui dans les activités d'agriculture urbaine.

Participation volontaire et droit de retrait

Vous êtes libre de participer à ce projet de recherche. Vous pouvez aussi mettre fin à votre participation sans conséquence négative ou préjudice et sans avoir à justifier votre décision. Si vous décidez de mettre fin à votre participation, il est important d'en prévenir le chercheur dont les coordonnées sont incluses dans ce document. Tout le matériel permettant de vous identifier, incluant l'enregistrement de l'entrevue, et les données que vous aurez fournies seront alors détruits, à moins que vous n'autorisiez le chercheur à les utiliser

pour la recherche, malgré votre retrait. Le cas échéant, ils seront conservés selon les mesures décrites ci-après et qui seront appliquées pour tous les participants.

Confidentialité

En recherche, les chercheurs sont tenus d'assurer la confidentialité aux participants. A cet égard, voici les mesures qui seront appliquées dans le cadre de la présente recherche :

Durant la recherche:

votre nom et tous ceux cités durant l'entrevue seront remplacés par un code;

seul le chercheur aura accès à la liste contenant les noms et les codes, elle-même conservée séparément du matériel de la recherche, des données et des formulaires de consentement;

tout le matériel de la recherche, incluant les formulaires de consentement et les enregistrements, sera conservé dans un classeur barré, dans un local sous clé;

les données en format numérique seront, pour leur part, conservées dans des fichiers encryptées dont l'accès sera protégé par l'utilisation d'un mot de passe et auquel seul le chercheur aura accès;

Lors de la diffusion des résultats :

les noms des participants ne paraîtront dans aucun rapport;

les résultats seront présentés sous forme globale de sorte que les résultats individuels des participants ne seront jamais communiqués;

les résultats de la recherche seront publiés dans des revues scientifiques, et aucun participant ne pourra y être identifié ou reconnu;

Après la fin de la recherche :

tout le matériel et toutes les données seront utilisés dans le cadre exclusif de cette recherche et ils seront détruits au plus tard en (décembre 2021);

Remerciements

Votre collaboration est précieuse pour nous permettre de réaliser cette étude. C'est pourquoi nous tenons à vous remercier pour le temps et l'attention que vous acceptez de consacrer à votre participation.

Signatures

Je soussigné(e) _____ consens librement à participer à la recherche intitulée : Motivations individuelles dans la pratique de l'agriculture urbaine dans les quartiers défavorisés : Trois cas de villes de différent contexte socio-économique. J'ai pris connaissance du formulaire et j'ai compris le but, la nature, les avantages, les risques et les inconvénients du projet de recherche. Je suis satisfait(e) des explications, précisions et réponses que le chercheur m'a fournies, le cas échéant, quant à ma participation à ce projet.

J'autorise le chercheur à capter mon image si nécessaire dans le cadre de cette recherche sous forme d'enregistrement :

Photo : %oui Oui %oui Non

Vidéo : %oui Oui %oui Non

Signature du participant, de la participante Date

J'ai expliqué le but, la nature, les avantages, les risques et les inconvénients du projet de recherche au participant. J'ai répondu au meilleur de ma connaissance aux questions posées et j'ai vérifié la compréhension du participant.

Signature du chercheur ou de son représentant Date

Renseignements supplémentaires

Si vous avez des questions sur la recherche, sur les implications de votre participation ou pour se retirer du projet, veuillez communiquer avec Pierre Paul Audate, au numéro de téléphone suivant : _____ ou à l'adresse courriel suivante : _____ ou vous adresser aux professeurs Alexandre Lebel _____ et Geneviève Cloutier _____

Plaintes ou critiques

Toute plainte ou critique sur ce projet de recherche pourra être adressée au Bureau de l'Ombudsman de l'Université Laval :

Pavillon Alphonse-Desjardins, bureau 3320
2325, rue de l'Université
Université Laval
Québec (Québec) G1V 0A6
Renseignements - Secrétariat : (418) 656-3081
Ligne sans frais : 1-866-323-2271
Courriel : info@ombudsman.ulaval.ca

Copie du participant

Questionnaire des données sociodémographiques des participants

Motivations individuelles dans la pratique de l'agriculture urbaine dans les quartiers défavorisés Questionnaire d'enquête sur les caractéristiques et motivations		
Nom de l'enquêteur.....	Date.....Heure.....	NO.....

Partie I: Caractéristiques sociodémographiques

1. Quel est votre catégorie d'âge?
 Moins de 18 ans 18 – 45 ans 46- 65 ans 65 ans et plus

2. Quel est votre sexe?
 Homme Femme Autre identité

3. Quel est le niveau d'études le plus haut que vous avez complété?
 Aucune scolarité Primaire Secondaire École professionnelle
 Université premier cycle Université 2^{ème} ou 3^{ème} cycle Autre, précisez.....

4. Quelle est votre occupation actuelle?
 Employé Travailleur indépendant Au chômage Retraité
 Autre

5. Quel est votre niveau de revenu mensuel ? (*Convertir le montant indiqué par le répondant en dollar US selon le taux du jour affiché par la banque centrale du pays*)
 Moins de \$100 \$100 - \$ 500 \$500 - \$1000 \$1000 - \$10000
 \$10000 et plus

6. Laquelle de ces deux catégories décrit le mieux votre situation dans le pays?
 Immigrant Non-immigrant

7. Dans quel milieu habitez-vous avant de commencer à faire de l'agriculture urbaine?
 Rural Périurbain Urbain

- 7b. Où habitez-vous maintenant? Dans le quartier Dans un autre quartier

8. Quelle est la structure du ménage dans lequel vous vivez?
 Couple sans enfant (s) Couple avec enfant (s)

%01 Adulte sans enfant (s)

%01 Adulte avec enfant (s)

%01 Autre

9. Combien de personnes vivent dans votre ménage? _____

10. Quelle est la taille de la parcelle où vous pratiquez l'agriculture urbaine? _____

11. Comment pratiquez-vous l'agriculture urbaine?

%0Seul

%0 En famille

%0 En groupe

12. À quel type d'agriculture urbaine identifieriez-vous votre pratique?

Jardin individuel

Jardin familial

Jardin communautaire

Jardin collectif

Jardin institutionnel

Jardin commercial

Autre,

précisez.....

13. Quelle est la profession qui décrit le mieux votre pratique d'agriculture urbaine?

%0Agriculteur (trice)

%0 Jardinier (ère)

%0 Fermier (ère)

%0Amateur (trice)

%0Aucun, précisez.....

Partie II: Besoins d'existence ou de survie

A. Alimentation :

Selon une échelle de 1 à 5, dans quelle mesure êtes-vous d'accord ou en désaccord avec les affirmations suivantes :

1. Je crois que les produits de mon jardin sont plus sains que ceux des supermarchés.

1. Pas du tout d'accord
désaccord

2. En désaccord
4. D'accord

3. Ni d'accord ni
5 Tout à fait d'accord

2. Je mange les produits cultivés dans mon jardin.

1. Pas du tout d'accord
désaccord

2. En désaccord
4. D'accord

3. Ni d'accord ni
5 Tout à fait d'accord

3. Les produits de mon jardin diversifient ma diète.

1. Pas du tout d'accord
désaccord

2. En désaccord
4. D'accord

3. Ni d'accord ni
5 Tout à fait d'accord

4. Le sol de mon jardin peut être contaminé par des métaux lourds.

1. Pas du tout d'accord
désaccord

2. En désaccord
4. D'accord

3. Ni d'accord ni
5 Tout à fait d'accord

Choisissez une réponse

5. Les produits cultivés dans mon jardin permettent une consommation :

1. rare

2. Occasionnelle (près DE 25%)

3. De la moitié de mes

besoins en fruits et légumes pendant la saison

4. Totale de mes besoins de

fruits et légumes pour une saison
de l'année

5 Totale de mes besoins de fruits et légumes

6. Quelle est votre perception du risque sanitaire des produits cultivés en milieu urbain?

1. Je n'ai aucune connaissance des risques
2. J'ai un peu de connaissance des risques
3. Je connais les risques
4. Il n'y a pas de risque

B. Revenu :

1. Je vends les surplus de production.

%Non %Oui,

Si Oui, combien :

%La totalité %plus que la moitié %moitié %moins de la moitié

2. En faisant l'agriculture urbaine je fais des économies sur mes dépenses alimentaires.

1. Pas du tout d'accord
2. En désaccord
3. Ni d'accord ni désaccord
4. D'accord
5 Tout à fait d'accord

3. L'agriculture urbaine est mon unique source de revenu

%Non %Oui

C. Santé physique:

1. Je pratique l'agriculture urbaine pour faire de l'exercice physique

1. Pas du tout d'accord
2. En désaccord
3. Ni d'accord ni désaccord
4. D'accord
5 Tout à fait d'accord

2. Les activités de l'agriculture urbaine améliorent ma santé physique

1. Pas du tout d'accord
2. En désaccord
3. Ni d'accord ni désaccord
4. D'accord
5 Tout à fait d'accord

3. Les activités d'agriculture urbaine ne représentent aucun risque pour ma santé physique

1. Pas du tout d'accord
2. En désaccord
3. Ni d'accord ni désaccord
4. D'accord
5 Tout à fait d'accord

4. Les activités d'agriculture urbaine me fatiguent physiquement

1. Pas du tout d'accord
2. En désaccord
3. Ni d'accord ni désaccord
4. D'accord
5 Tout à fait d'accord

D. Santé mentale:

1. Je pratique l'agriculture urbaine pour réduire mon stress

1. Pas du tout d'accord
2. En désaccord
3. Ni d'accord ni désaccord
4. D'accord
5 Tout à fait d'accord

2. Les activités de l'agriculture urbaine augmentent mon bien-être personnel

- | | | |
|-------------------------|-----------------|------------------------|
| 1. Pas du tout d'accord | 2. En désaccord | 3. Ni d'accord ni |
| désaccord | 4. D'accord | 5 Tout à fait d'accord |

3. Je suis beaucoup plus stressé en faisant de l'agriculture urbaine.

- | | | |
|-------------------------|-----------------|------------------------|
| 1. Pas du tout d'accord | 2. En désaccord | 3. Ni d'accord ni |
| désaccord | 4. D'accord | 5 Tout à fait d'accord |

4. Je vois mon jardin comme un espace de loisir

- | | | |
|-------------------------|-----------------|------------------------|
| 1. Pas du tout d'accord | 2. En désaccord | 3. Ni d'accord ni |
| désaccord | 4. D'accord | 5 Tout à fait d'accord |

Partie III : Besoins de rapport social

1. Mon jardin me permet de me socialiser avec d'autres participants

- | | | |
|-------------------------|-----------------|------------------------|
| 1. Pas du tout d'accord | 2. En désaccord | 3. Ni d'accord ni |
| désaccord | 4. D'accord | 5 Tout à fait d'accord |

2. Le jardin me permet de faire de nouveaux amis

- | | | |
|-------------------------|-----------------|------------------------|
| 1. Pas du tout d'accord | 2. En désaccord | 3. Ni d'accord ni |
| désaccord | 4. D'accord | 5 Tout à fait d'accord |

3. je préfère travailler mon jardin seul

- | | | |
|-------------------------|-----------------|------------------------|
| 1. Pas du tout d'accord | 2. En désaccord | 3. Ni d'accord ni |
| désaccord | 4. D'accord | 5 Tout à fait d'accord |

4. Je préfère travailler en groupe dans mon jardin

- | | | |
|-------------------------|-----------------|------------------------|
| 1. Pas du tout d'accord | 2. En désaccord | 3. Ni d'accord ni |
| désaccord | 4. D'accord | 5 Tout à fait d'accord |

5. Je fais de l'agriculture urbaine pour apprendre de nouvelles connaissances et techniques

- | | | |
|-------------------------|-----------------|------------------------|
| 1. Pas du tout d'accord | 2. En désaccord | 3. Ni d'accord ni |
| désaccord | 4. D'accord | 5 Tout à fait d'accord |

Partie IV : Besoins de développement personnel

1. Je fais l'agriculture urbaine pour faire passer un message politique

- | | | |
|-------------------------|-----------------|------------------------|
| 1. Pas du tout d'accord | 2. En désaccord | 3. Ni d'accord ni |
| désaccord | 4. D'accord | 5 Tout à fait d'accord |

2. Je fais l'agriculture urbaine pour aider les autres résidents du quartier à mieux s'alimenter

- | | | |
|-------------------------|-----------------|------------------------|
| 1. Pas du tout d'accord | 2. En désaccord | 3. Ni d'accord ni |
| désaccord | 4. D'accord | 5 Tout à fait d'accord |

3. Je fais l'agriculture urbaine pour verdir mon quartier

1. Pas du tout d'accord
désaccord

2. En désaccord

4. D'accord

3. Ni d'accord ni

5 Tout à fait d'accord

4. Les produits récoltés sont donnés à une autre personne ou une organisation.

%Oui

%Non

Partie V : Priorités des fonctions

1. Selon vous, laquelle de ces trois fonctions d'un jardin urbain représente votre raison de pratiquer l'AU

a. Alimentation
quartier

b. Contact avec d'autres personnes

c. Verdir le

2. Choisissez la phrase qui décrit le mieux votre jardin

a. Mon jardin embellit le quartier

b. Mon jardin me permet d'être en contact avec d'autres personnes

c. Mon jardin me nourrit

d. mon jardin est une source de revenu?

.....FIN.....

N.B. Ce questionnaire sera téléchargé dans une tablette et le chercheur posera les questions verbalement au répondant ce qui donnera la même possibilité aux gens ne sachant pas lire et écrire de répondre aux questions.

Grille des entretiens des participants

Grille d'entretien pour personnel d'organisation

Partie A : Vision et expérience de l'organisation

1. En quelques mots en quoi consiste votre travail et le travail de votre organisation?

1.1. Quels sont les objectifs et la vision de votre organisation pour les résidents du quartier?

2. Comment s'est amorcé le projet d'agriculture urbaine dans le quartier ?

2.2. Quels ont été les obstacles ou les défis rencontrés?

3. Comment votre organisation imagine l'évolution des activités d'agriculture urbaine dans le quartier dans les prochaines années.

Partie B : Motivations et état des lieux

1. Comment était l'intérêt des résidents du quartier pour l'agriculture urbaine au début? Et qu'est-ce qui a changé depuis?

2. D'après vous, qu'est-ce qui motive les résidents du quartier à faire de l'AU?

3. Comment est la dynamique des activités du jardin? (Comment s'organise la production, l'entretien, la récolte)

4. Dans quel état se trouvaient les terrains avant de pouvoir y faire de l'agriculture urbaine ?

5. Qu'est-ce qui vous préoccupe le plus dans le quartier?

.....Merci pour votre collaboration.....

Grille d'entretien pour pratiquants de l'agriculture urbaine

Partie A. Origine d'implication et intérêts dans l'agriculture urbaine

1. Pouvez-vous me raconter comment vous en êtes venu à faire de l'agriculture urbaine ?

1.1. Qu'est-ce qui vous a motivé à faire de l'agriculture urbaine?

2. Parlez-moi de votre pratique.

2.1. Comment pratiquez-vous, à quels moments, avec qui, combien de temps passez-vous dans le jardin?

2.2. Quels sont les défis/inconvénients auxquels vous faites face dans cette activité?

2.3. Avez-vous reçu une formation sur l'agriculture urbaine?

3. Parlez-moi maintenant de ce que l'AU vous amène : depuis que vous pratiquez l'AU qu'est-ce qui a changé dans votre vie, ou votre famille?

3.1. Que faites-vous avec les produits récoltés du jardin?

3.2. Est-ce que l'agriculture urbaine peut combler tous les besoins alimentaires de votre famille?

3.3. Indiquez les trois plus importantes contributions de l'agriculture urbaine pour vous?

Partie B. Implication personnelle et interactions sociales

1. Comment est la dynamique des activités du jardin? (comment s'organise la production, l'entretien, la récolte)

1.1. Comment les autorités municipales interviennent-elles dans cette dynamique? Quel rôle jouent-elles? Y a-t-il d'autres organisations qui interviennent dans le projet d'AU?

2. Avant de participer aux initiatives d'agriculture urbaine étiez-vous impliqué dans une autre activité vous mettant en contact avec les autres participants des initiatives d'AU dans le quartier?

2.1. Avec d'autres participants ou d'autres projets?

3. Parlez-moi un peu de votre relation avec les autres participants des initiatives d'AU du quartier?

4. Comment voyez-vous votre rôle dans le quartier dans les dix prochaines années?

5. Quel est votre souhait pour les initiatives d'AU qui se font dans le quartier?

.....Merci pour votre collaboration.....

Lettres d'appui institutionnel

Lettre de La Maison de quartier Villeray



La Maison de quartier Villeray

**660, rue Villeray, Montréal (Qc) H2R 1J1 Tél. : (514)
272-4589 Téléc. : (514) 279-0120**

Courriel : mqv@bellnet.ca

Montréal, le 18 avril 2018

À Monsieur PIERRE PAUL AUDATE

Étudiant au Doctorat en Aménagement du Territoire et Développement Régional
Université Laval, Québec, Canada

Monsieur,

Par la présente, j'appuie, au nom de mon organisme, le projet Motivations individuelles dans la pratique de l'agriculture urbaine dans les quartiers.

En effet, LA MAISON DE QUARTIER VILLERAY s'engage à faciliter le travail de terrain sur :

- L'identification des participants pour l'enquêtes et entrevues
- Offrir un espace pour réaliser les entrevues
- Offrir un espace pour les ateliers de focus groupe



Quito, 17 de abril de 2018
Oficio No. 2018 - 226 - DE - CC

Señor
Alexandre Lebel PhD
ÉCOLE SUPÉRIEURE D'AMÉNAGEMENT DU TERRITOIRE ET DE DÉVELOPPEMENT RÉGIONAL
PLATEFORME D'ÉVALUATION EN PRÉVENTION DE L'OBÉSITÉ, CRIUCPQ
UNIVERSITÉ LAVAL, QUÉBEC
Presente

De mi consideración:

En atención a su carta del 11 de abril de 2018, en la cual solicita el apoyo de la Agencia de Promoción Económica CONQUITO para la realización del estudio de doctorado del señor Pierre Paul Audate, sobre las motivaciones individuales en la práctica de la agricultura urbana en barrios desfavorecidos, propuesto para las parroquias de Quitumbe y Turubamba al sur de Quito, debo informar que el tema es de interés institucional ya que desde ésta instancia se ejecuta el Proyecto de Agricultura Urbana Participativa AGRUPAR.

CONQUITO puede colaborar con la investigación, facilitando el contacto con los agricultores, salidas de campo junto a los técnicos del proyecto AGRUPAR para ubicación en el territorio de estudio, el espacio idóneo y equipamiento para la realización de talleres, así como un espacio dentro de la oficina del proyecto AGRUPAR para que el señor Audate pueda usarlo durante su estadía en Quito.

Contactarse con Alexandra Rodríguez, Responsable del Proyecto AGRUPAR a su correo electrónico arodriguez@conquito.org.ec para coordinar actividades.

Atentamente,

Lettre de l'Association des jardins collectifs de Parc-Extension

Montréal, le 21 mai 2018

À qui de droit.

Nous, Association des jardins collectifs de Parc-Extension, acceptons de soutenir l'étudiant au doctorat Pierre Paul Audate dans sa collecte d'informations sur l'agriculture urbaine. Ce soutien consistera à lui permettre d'accéder aux espaces que nous cultivons et de rencontrer les membres volontaires pour participer à l'enquête.

Lettre de l'Organisation SAKALA

Entretiens_Agriculture urbaine_Haiti

>>> Pierre Paul Audate
>>> Étudiant au Doctorat
>>> Université, Laval

>>> _____
>>> De : SAKALA Ayiti
>>> Envoyé : 21 novembre 2018 11:00
>>> À : Pierre Paul Audate
>>> Objet : Re: Entretiens_Agriculture urbaine_Haiti
>>>
>>> avec plaisir. est ce que vous avez une idee deja de la quantite de
>>> gens avec lesquels vous souhaitez vous entretenir. Comme ca je
>>> pourrais m'arranger pour vous trouver les personnes cles.
>>> Merci de votre interet dans le travail que l'on fait en haiti a Cite Soleil

>>> On Wed, Nov 21, 2018 at 11:43 AM Pierre Paul Audate
>>> <pierre-paul.audate.1@ulaval.ca> wrote:
>>> >

Lettre du FOKAL



Fondasyon konesans ak libète
Fondation connaissance et liberté

Port-au-Prince, 8 mai 2018

À : Mr. Pierre Paul Audate
Étudiant au doctorat en Aménagement du territoire et développement régional
Université Laval Canada

Objet : Appui au projet de recherche

Monsieur,

En réponse à votre demande d'appui à la « *Fondation Connaissance et Liberté (FOKAL)* » pour la réalisation du projet de thèse doctorale sur les motivations individuelles dans la pratique de l'agriculture urbaine dans les quartiers défavorisés, je vous annonce que le thème est de l'intérêt de notre organisation et je vous confirme notre appui pour la réalisation des activités de terrain dans les quartiers de « *Martissant, Port-au-Prince, Haïti* »

FOKAL peut collaborer dans la réalisation des activités de la recherche en facilitant :

- ✓ L'identification des participants de projet d'agriculture urbaine pour la réalisation des enquêtes et entrevues
- ✓ Le déplacement pour la réalisation des enquêtes et entrevues avec les participants
- ✓ Un espace équipé pour la réalisation des focus groupes avec les participants.

Vous pouvez rentrer en contact avec Thierry CHERIZARD pour planifier les activités de terrain.