



Initiatives citoyennes de conservation de la nature en milieu urbain : rôle des jardins partagés

Ana Cristina Torres

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Par

Ana Cristina TORRES

Initiatives citoyennes de conservation de la nature en milieu urbain : rôle des jardins
partagés

Thèse présentée et soutenue à Paris, le 14 décembre 2017 :

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« Ce qui est essentiel, c'est qu'un chercheur découvre la complexité de l'objet de sa recherche, c'est qu'un spécialiste d'une discipline refuse le ghetto de sa discipline en même temps que la position hiérarchique qui lui a été attribuée par rapport aux autres disciplines. En débordant par nécessité des limites prescrites à son domaine traditionnel, le chercheur se donne l'occasion de voir autrement et de rencontrer d'autres collègues qui ont fait la même démarche que lui à partir de leurs propre discipline ».

Jean- Marie Legay, 1986



Victor Locuratolo (locuratolov@yahoo.fr)

« Il pousse plus de choses dans un jardin qu'on n'en a semé »
Proverbe serbo-croate

Aux jardiniers...

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Avant-propos

Les expériences vécues tout au long de ma vie ont orienté mon avenir professionnel. Dans mon quotidien je prenais du plaisir à observer et interagir avec les êtres vivants, je prenais du plaisir à faire des excursions dans les montagnes et les ravins qui entourent Quito, pour découvrir des plantes, collecter des fleurs, chercher des animaux, essayer de les identifier. Je prenais du plaisir à observer le jardin de ma grand-mère avec ses variétés de roses et de fruits, collecter des abricots et des mirabelles. Au collège, j'ai eu la chance d'avoir un professeur, biologiste de carrière, qui contrairement à la pratique courante d'enseignement en Equateur organisait des excursions naturalistes dans trois des quatre régions du pays : la forêt amazonienne, la côte et les Andes. C'est grâce à lui que j'ai découvert l'existence de la profession de biologiste. Emue par cette découverte, je racontai à mes parents mon intérêt pour suivre cette carrière universitaire : inquiets (parce que l'habitude est de devenir ingénieur, docteur ou avocat) mais avec une envie de me soutenir, ils m'ont conseillé de faire d'abord un stage pour être certaine de ma décision. J'ai commencé ainsi mon premier stage pendant ma dernière année de lycée à *Birdlife international*. C'était une expérience enrichissante pendant laquelle j'ai fait de nombreuses rencontres avec d'autres biologistes de cette institution, mais aussi avec d'autres d'institutions nationales et internationales. Cette expérience m'a ouvert des portes, pour faire des travaux de terrain, collaborer dans des recherches et écrire des publications.

Je me suis inscrite dans la faculté de biologie de l'Université Catholique de Quito en Equateur, simplement parce que j'aime les expériences de nature. Dans cette formation, j'ai appris surtout des outils pour identifier la biodiversité biologique et pour étudier ses populations. Petit-à-petit j'ai commencé à entendre parler de la perte de la diversité biologique et des habitats ; un jour, un ami canadien m'a offert le livre d'Al Gore « An inconvenient truth : the planetary emergency of global warming and what we can do about it » publié en 2006. J'ai dévo-

ré ce livre et j'ai commencé à me poser des questions sur les relations des êtres humains avec le reste du monde. Je n'ai pas trouvé de réponses à ces questionnements dans la faculté, et je me suis rendue compte trop tard que cette formation n'offrait aucun cursus qui prenne en compte les sociétés¹ dans ses réflexions autour des écosystèmes. En essayant de remplir ce vide, j'ai réalisé divers stages et travaux de courte durée parallèlement à ma formation universitaire, en lien avec la protection des espèces et des écosystèmes : assistante de terrain pour des projets de protection des oiseaux, enseignante dans des projets d'éducation environnementale, collaboration dans l'élaboration de conférences et dans l'actualisation des bases des données des oiseaux pour l'établissement des zones prioritaires pour la conservation. J'ai fini ma licence avec beaucoup de questions : comment la protection de l'environnement peut-elle être possible sans prendre en compte les êtres humains ? C'est avec curiosité et une envie d'apprendre, que j'ai découvert le « Master en Biologie et Conservation de la Biodiversité » à Salamanca, en Espagne. Cette formation m'a fourni de nouveaux outils pour l'étude de la diversité biologique et m'a apporté des connaissances sur des politiques de conservation et de gestion de la biodiversité, surtout dans des parcs nationaux.

Suite à cette formation, mes questions se sont accentuées. J'ai commencé à me former sur les origines de la biologie de la conservation. En lisant son histoire, je me suis rendue compte que le mot « conservation » était associé à préserver une nature extérieure à l'humain, aussi sauvage que possible. Cette approche des cultures dites occidentales niait une très ancienne cohabitation ou coévolution entre la nature et les populations humaines qui y vivaient. Or, si les parcs nationaux ont une importance en tant que mesures d'urgence face à la perte des écosystèmes et de la diversité biologique, il me semble nécessaire pour assurer la durabilité des mesures de protection, d'envisager également d'autres solutions. Ainsi, je me suis ainsi orientée

¹ Au-delà de considérer les êtres humains comme une menace latente pour la diversité biologique et pour les écosystèmes.

vers la durabilité. J'ai trouvé un Master à Paris en « Développement agricole durable : la sécurité alimentaire pour le développement ». Je me suis trouvée face à un double défi : la pluridisciplinarité et une langue étrangère. Ce double défi a été très riche, ces deux expériences nouvelles m'exigeaient beaucoup de concentration et engagement, par l'étrangeté de la langue mais aussi par la découverte des nouveaux concepts, approches ou façons de lire et aborder des problématiques de recherche. Cette formation m'a ouvert le regard sur la notion de la « diversité », la diversité pas seulement biologique mais aussi de cultures² et des formes qui résultent de nos interactions dans des socio-écosystèmes.

Suite à cette expérience, mon envie de consacrer ma vie professionnelle à la recherche est apparue. J'ai cherché une façon de tisser des relations entre toutes mes expériences précédentes et mes formations. Cette thèse est le fruit de ce tissage.

² Dans le sens agricole et des groupes sociaux.

INTRODUCTION GENERALE

1. La dégradation de la biosphère... un sentiment d'urgence

Depuis quelques années, un sentiment d'urgence s'est installé dans certains discours, qui soulignent une préoccupation grandissante liée à la dégradation de la biosphère³ (Steffen et al., 2011; Steffen, Crutzen, & McNeill, 2007). Quatre dimensions sont surtout évoquées : le changement climatique, l'effondrement de la diversité biologique, la raréfaction des ressources naturelles et les effets de plus en plus massifs des pollutions et des transformations du cadre de vie sur la santé humaine (Bonneuil & Fressoz, 2013).

Pour certains auteurs, l'impact des activités humaines et des déchets d'origine anthropique ont un effet tellement profond que même les processus géologiques sont touchés (Lewis & Maslin, 2015; Steffen et al., 2011, 2007; Waters et al., 2016). En effet, des chercheurs ont estimé que la seule espèce humaine, dont les populations sont passées de 900 millions d'individus en 1800 à 7 milliards en 2012, s'approprie à elle seule près du tiers de la production de la biomasse continentale (Haberl et al., 2007).

Parallèlement, d'autres auteurs soulignent le problème de se référer à l'humanité comme un tout, sans prendre en compte l'existence des cultures diverses, des asymétries profondes dans les impacts des humains sur la nature⁴, des responsabilités, des rapports de production ou des rapports d'échange et de pouvoir. Ces auteurs ne considèrent pas que c'est l'humanité en tant que telle qui est la cause de la dégradation de la planète, mais plutôt que ce sont d'une part la logique propre au capitalisme d'accumulation sans fin du capital, et d'autre part les échanges

³ Définie comme le système écologique global qui intègre tous les êtres vivants et leurs relations. Les personnes et les sociétés sont ancrées dans la biosphère (Folke & Gunderson, 2012).

⁴ Le mot nature fait généralement référence à des phénomènes naturels du monde physique, mais ce terme englobe une diversité des conceptions culturelles (Kluckhohn & Strodtbeck, 1961). Dans ce travail, j'adopte une définition de la nature flexible, respectueuse de ces différentes représentations sociales et qui inclue toute la biodiversité, d'un jardin urbain à une forêt tropicale.

écologiques inégaux qui se jouent entre différents territoires, qui sont à l'origine de la fin de l'holocène (Moore, 2016). D'ailleurs, une étude sur les inégalités mondiales d'émissions de CO₂e⁵ entre individus dans le monde indique que les 10% des individus les plus émetteurs sont aujourd'hui responsables de 45% des émissions mondiales alors que les 50% les moins émetteurs sont responsables de moins de 13% des émissions⁶ (Chancel & Piketty, 2015). Ces chercheurs ont mis en avant que parmi les individus les plus émetteurs de la planète en 2013, 1% d'entre eux sont les plus riches Américains, Luxembourgeois, Singapouriens et Saoudiens, avec des émissions annuelles par personne supérieures à 200t de CO₂e, alors qu'à l'autre extrémité du spectre on retrouve les individus les plus pauvres du Honduras, du Mozambique, du Rwanda et du Malawi, dont les émissions sont 2000 fois plus faibles, proches de 0.1t de CO₂ par personne et par an. En outre, une autre étude dévoile que deux tiers des émissions mondiales de gaz à effet de serre accumulées dans l'atmosphère depuis le début de la révolution industrielle sont causées par seulement 90 entreprises (Heede, 2014).

La dégradation de la biosphère soulève des questions sur les rapports⁷ existant dans les socio-écosystèmes⁸ : rapports des êtres humains à la nature (Lewis & Maslin, 2015; Steffen et al., 2011, 2007; Waters et al., 2016), mais aussi relations des êtres humains entre eux et avec la nature (p. ex. Moore, 2016). Dans tous les cas, la thématique de la dégradation de la biosphère est mise au cœur des arènes politiques, scientifiques, citoyennes et des différents mouvements sociaux.

⁵ CO₂ et d'autres gaz à effet de serre.

⁶ Les grands émetteurs sont répartis aujourd'hui sur tous les continents, un tiers d'entre eux vient des pays émergents (Chancel & Piketty, 2015).

⁷ Lien impliquant une interdépendance, une interaction.

⁸ J'adhère à une communauté d'universitaires qui utilisent le terme socio-écosystème pour qualifier les interconnexions complexes entre les dimensions sociales et écologiques. Dans ce sens, nous considérons la « nature » et les « sociétés » comme des dimensions des socio-écosystème (Berkes & Folke, 1998; Folke, Biggs, Norström, Reyers, & Rockström, 2016; Folke & Gunderson, 2012).

2. Cadres conceptuels pour conserver la nature

Les objectifs et la manière de conduire des recherches et des projets de conservation sont fortement et directement liés aux différentes représentations des rapports entre les êtres humains et la nature, qui évoluent au cours du temps. De manière générale, Mace (2014b) identifie les quatre cadres de conservation suivants⁹ (Figure 1).

a) La nature pour ce qu'elle est

Le premier cadre, « **la nature pour ce qu'elle est** » place en priorité de conservation la préservation de la « *wilderness*¹⁰ ». Il s'agit ici de protéger la nature pour elle-même, mais aussi finalement pour une élite contemplative ou scientifique (Larrere et al. 2009 cité par Mathevet & Marty 2015 :35).

Dans ce cadre, les travaux scientifiques se concentrent sur le suivi des espèces sauvages, et sur des travaux en histoire naturelle et en écologie théorique (Bowes & Allen, 1969; Busack, 1976; Corner, 1968; Eisenberg & Seidensticker, 1976; Peterken, 1968).

Cette conception de la conservation ne reconnaît pas les transformations opérées par les populations humaines sur les espaces dans lesquels ils vivaient bien avant l'arrivée des premiers colons (Beau 2017 : 213), et les politiques de conservation associées ont entraîné le déplacement ou l'élimination des peuples autochtones (p. ex. au Guatemala, en Ouganda, en Inde ou en Australie : (Callicott, 2008; Whitelock, 1985), ce qui les a largement remises en questions (Brockington & Igoe, 2006; Guha, 1989; Sarkar, 1998, 1999).

⁹ Je souligne que la protection des espèces existait avant les périodes décrites ici. Par exemple, en Inde l'empereur Mauryan Asoka (299-237 av. J. -C) a ordonné la préservation des forêts qui constituaient des habitats pour les éléphants composante importante de son armée (Sarkar, 2009). Un autre exemple est celui des pays européens (notamment l'Allemagne) qui, à partir du XVIII^{ème} siècle conscients des effets de la perte des forêts dans leur pays, leurs colonies et leurs ex-colonies, ont concentrés leurs recherches en foresterie, en recherchant le maintien de la production économique de ces forêts (Grove, 1995). Ma tâche consistera à me concentrer sur des cadres de conservation décrits par Mace et al. 2014.

¹⁰ Mot qui n'a pas vraiment d'équivalent en français, mais qui a été traduit par certains auteurs comme « nature sauvage » p.ex. (Descola 2005 :81) ou « nature vierge » p.ex. (Blandin, 2009: 33-34). Car cette notion est difficile à traduire (Larrère 1997), je ne la traduis pas dans le texte.

A la fin des années 1960, l'éditorial du volume 1-numéro 2 de la revue *Biological Conservation* témoigne d'une acceptation mélancolique des changements de la biosphère, en soulignant que «...de moins en moins, [le monde] restera naturel...»¹¹ et reconnaît l'idée d'envisager les conditions d'une exploitation durable des ressources pour prendre soin simultanément des besoins des humains et de la nature, même si cela n'est plus conforme avec la ligne d'une « conservation puriste » (N.P, 1969 : 103-104). C'est dans ce contexte que des initiatives intergouvernementales envisagent de prendre en compte une déclaration universelle sur la protection et l'amélioration de l'environnement humain (UNESCO, 1968). Parallèlement, les aires protégées commencent à faire l'objet d'un changement d'orientation, avec la prise en compte des populations locales. A l'échelle internationale, le programme l'Homme et la Biosphère (MAB, pour *Man and Biosphere*) est créé en 1971 et s'appuie sur des territoires d'expérimentation du développement durable, les réserves de biosphère (Mathevet & Marty, 2015).

b) La nature malgré les êtres humains

Un deuxième cadre de conservation, « **la nature malgré les êtres humains** » prédomine dans les années 1970-1980. Conscients de la destruction rapide des habitats et des espèces due à certaines activités humaines, des recherches et projets de conservation visent à ralentir ou inverser les processus qui menacent certaines espèces et certains habitats (Mace 2014b). C'est ainsi qu'à partir des années 1970 la biologie de la conservation est fondée comme une discipline organisée (Sarkar, 2009) avec une mission orientée (Soulé & Wilcox 1980 cité par Meine et al. 2006), celle de protéger la diversité biologique. A cette époque aus-

¹¹ Dans le texte: «We must accept it as inevitable that we cannot return to the world of yesteryear [sic], and probably in the biosphere less and less will remain natural any more» (N.P, 1969: 103-104).

si, des idées sur la gestion communautaire¹² (Agrawal & Gibson, 1999; Fikret Berkes, 2004; Hackel, 1999; Hutton, Adams, & Murombedzi, 2005), la taille minimale de populations viables (Traill, Bradshaw, & Brook, 2007), des niveaux de récolte durables ou sur l'usage durable des espèces sauvages sont en plein essor et débat (Mace 2014b). Un exemple remarquable est le texte de la convention sur la diversité biologique signé à Rio de Janeiro en 1992 et ratifié depuis par 168 pays¹³, qui attire l'attention sur les savoirs et les pratiques des communautés locales et des peuples autochtones pour l'entretien de la biodiversité et, plus généralement, pour un développement durable (Nations Unies, 1992).

c) La nature pour les êtres humains

Pendant les années 90s a émergé un troisième cadre de conservation, « **la nature pour les êtres humains** ». Orienté vers une attention accrue envers la dépendance des êtres humains à l'égard des biens et services fournis par les écosystèmes (Constanza et al., 1997; Redford & Adams, 2009), ce cadre inclut la notion de services écosystémiques¹⁴, utilisés comme un outil et comme une stratégie de conservation¹⁵. Dans ce cadre, l'idée selon laquelle les humains font partie des écosystèmes est plus largement acceptée ; ainsi, à la fois dans le discours et l'analyse, traiter séparément les êtres humains et la nature est de moins en moins fréquent (Lefeuvre, 1989; Mace, 2014). En effet, si la biologie de la conservation avait été expli-

¹² Dans les années 1980, des approches pour une conservation de la biodiversité à travers la gestion communautaire connaissent une diffusion rapide (Hutton, Adams, & Murombedzi, 2005).

¹³ [En ligne] URL : <http://www.humanite-biodiversite.fr/document/tout-savoir-sur-la-convention-sur-la-diversite-biologique-et-les-objectifs-d-aichi>. Consulté le 15/09/2017.

¹⁴ La notion de service écosystémique est complexe, et le sens qui lui est attribué varie selon les documents politiques, le contexte socioéconomique et les disciplines dont sont issus les auteurs qui mobilisent ce concept (Maris, Roche, Levrel, & Geijzenborffer, 2016). Par exemple il a été défini comme les « biens et les services provenant des processus biophysiques favorables au bien-être des humains et au soutien des fonctions sociétales » (Daily, 1997) ou comme les « bénéfices que les êtres humains tirent du fonctionnement des écosystèmes » (Millennium ecosystem assessment, 2005).

¹⁵ La notion de service écosystémique a été adoptée par différents acteurs, avec des représentations diverses. C'est pour cela qu'elle est au centre d'un débat animé, considérée par certains comme un concept qui promeut une vision néolibérale en se focalisant sur le paiement pour ces services (Redford & Adams, 2009; Wegner & Pascual, 2011), ce qui entraîne, selon ses détracteurs, la conservation des seules espèces et écosystèmes qui fournissent ces services (Redford & Adams, 2009).

citement conçue comme une discipline qui montrait le lien entre sciences biologiques et sciences sociales (Soulé, 1985), « *les dimensions sociales, éthiques, culturelles et/ou économiques [étaient] rarement prises en compte dans l'identification des causes et des issues proposées* » (Mathevet, 2010:441), Selon cet auteur, ce n'est que depuis les années 1990 que des travaux s'inscrivent dans l'interdisciplinarité avec les sciences humaines et sociales. Toutes ces disciplines sont alors réunies sous le vocable de « sciences de la conservation¹⁶ ».

Dès les années 2000 des recherches sur les écosystèmes urbains (Alberti et al., 2003; Miller & Hobbs, 2002) notamment autour des espaces verts urbains, prennent leur essor (Goddard, Dougill, & Benton, 2010). Ces espaces verts urbains sont étudiés en relation avec la conservation de la biodiversité (Adams, 2005; Fetridge, Ascher, & Langellotto, 2008; Gaston et al., 2007), ou parce qu'ils fournissent des services écosystémiques positifs pour la qualité de vie, la santé et le bien-être des citoyens (Cannon, 1999; Fuller, Irvine, Devine-Wright, Warren, & Gaston, 2007; González-García, Belliure, Gómez-Sal, & Dávila, 2009; Mitchell & Popham, 2008; Sperling & Lortie, 2010). Parallèlement, des études se développent sur les impacts négatifs de l'urbanisation sur la richesse des espèces natives (McKINNEY, 2002), l'homogénéisation des espèces (McKinney, 2006) ou la perte des habitats (Marzluff, Bowman, & Donnelly, 2001).

d) Les êtres humains et la nature

Ces dernières années, un autre cadre conceptuel a émergé, « **les êtres humains et la nature** », qui rejette la relation linéaire entre les humains et la nature caractéristique du cadre « la nature pour les êtres humains » (Mace, 2014).

¹⁶ Sarkar (2009) considère que les objectifs de ce domaine sont trop vastes pour n'identifier celui-ci que par le terme « biologie de la conservation », et souligne l'importance de trouver un terme qui reflète l'interdisciplinarité croissante du domaine. Dans ce sens, Barbault mentionne dans le livre de Primack et al. (2012 : 6) « On pourrait ne voir dans la biologie de la conservation *sensu stricto* qu'une discipline enracinée dans les sciences biologiques et évolutives tandis que la biologie de la conservation *sensu lato* deviendrait alors sciences de la conservation... et lieu de débats, d'échanges entre disciplines, qu'elles relèvent des sciences de la vie ou des sciences de l'homme et de la société ».

Dans ce dernier cadre, il n'existe pas d'écosystème non influencé par l'être humain et inversement, et l'existence de tout être humain dépend du fonctionnement des écosystèmes. Ce cadre met donc en évidence l'étroite interrelation entre ces deux entités et s'intéresse aux socio-écosystèmes (Berkes & Folke, 1998; Folke & Gunderson, 2012). Ainsi, les relations ne sont pas linéaires mais plutôt dynamiques et complexes (Carpenter et al., 2009) et à des échelles multiples, allant du local au global (Carpenter et al., 2009; Ostrom, 2009). Cette approche souligne l'importance des structures culturelles et des institutions pour le développement d'interactions résilientes et durables (Mace, 2014).

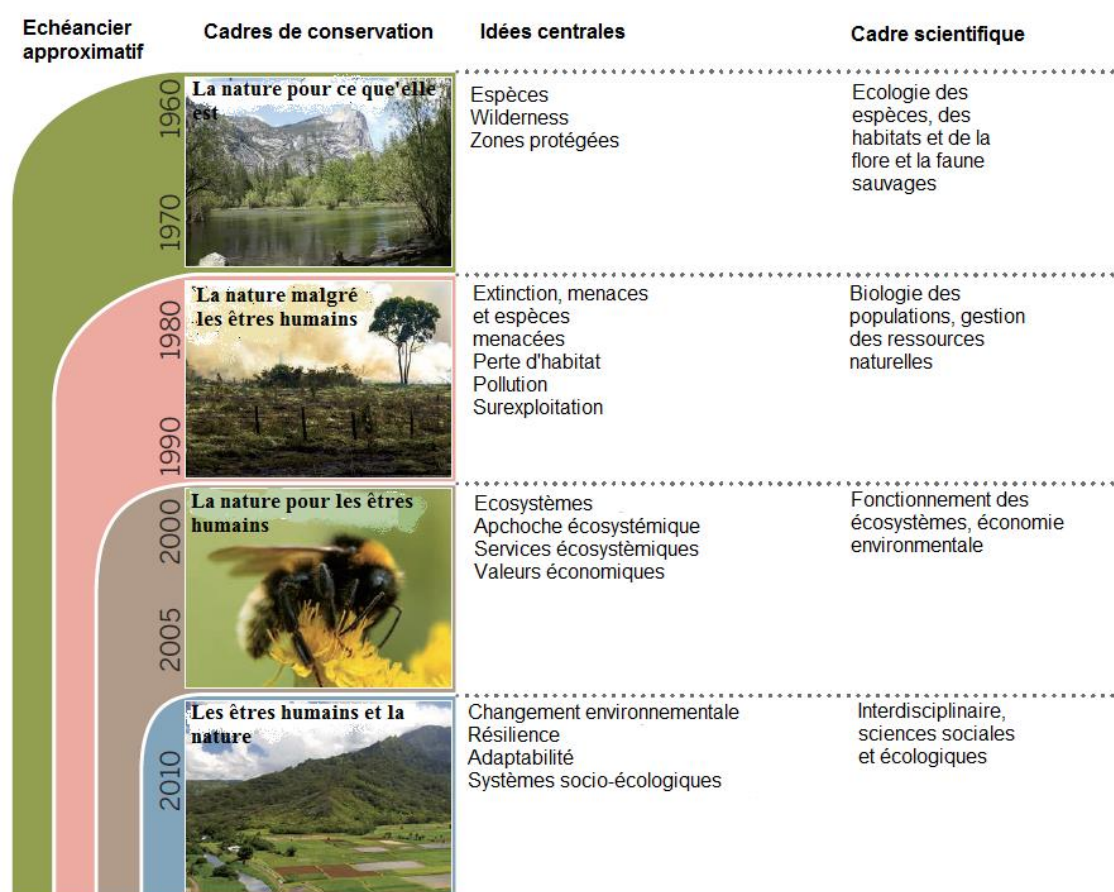


Figure 1. Evolution des cadres de conservation modernes (Figure extrait et traduit de Mace 2014b). *Aucun cadre scientifique n'a été supplanté par l'émergence d'un nouveau cadre. A ce jour, ils sont tous utilisés.

Ces visions plurielles soutiennent un éventail de positionnements sur la conservation allant de la préservation de la « *wilderness* » à la coopération avec la nature, en ciblant des espaces considérés comme sauvages jusqu'à des espaces anthropisés. Ces cadres de pensées sont associés à la fois à des valeurs et à des objectifs très différents en termes de trajectoires évolutives (Sarrazin & Lecomte, 2016). Ces cadres de pensées coexistent actuellement sans que les chercheurs et praticiens soient forcément conscients qu'ils impliquent des objectifs différents, ce qui est source de frictions et de tensions, alors même que la prise en compte de tous ces cadres pourrait permettre un renforcement mutuel des stratégies de conservation (Mace, 2014). C'est pourquoi un appel pour une conservation inclusive reconnaissant la diversité des valeurs a été lancé récemment (Tallis & Lubchenco, 2014).

3. Des valeurs pour justifier la conservation

Les différents positionnements de conservation soulèvent trois types de valeurs pour justifier la conservation (Figure 2).

a) Valeur intrinsèque

Il s'agit de donner une valeur à la nature par ce qu'elle vaut pour elle-même au-delà de son utilité pour les êtres humains (Larrère, 1997). Des initiatives de conservation qui mobilisent ces valeurs ont été développées surtout aux Etats-Unis (Callicott, 1999), mais elles ont été bien accueillies au niveau international. La preuve la plus visible en est la convention sur la diversité biologique de l'Organisation des Nations Unies, adoptée au Sommet de la Terre à Rio en 1992, qui reconnaît, dès son préambule, la valeur intrinsèque de la diversité biologique (Nations Unies, 1992).

b) Valeur instrumentale

Il s'agit de donner une valeur à la nature pour les biens qu'elle fournit aux populations humaines (matières premières, produits agricoles, etc.), ainsi que pour les services qu'elle leur rend (pollinisation, fixation des nitrates, régulation homéostatique, inspiration, etc.) (Reid, 2006). La notion de services écosystémiques, prônée par différents acteurs, illustre la mobilisation de ces valeurs (Daily, 1997; Millennium ecosystem assessment, 2005). Un autre exemple est l'apparition récente de la « nouvelle conservation »¹⁷ qui considère explicitement que nous devons « *protéger la nature pour les humains plutôt que contre eux* »¹⁸ (Kareiva & Marvier, 2012).

c) Valeur relationnelle

Contrairement à l'idée selon laquelle les personnes donnent une valeur à la nature en se basant uniquement sur la valeur inhérente de ses éléments (valeur intrinsèque) ou pour satisfaire leurs préférences (valeur instrumentale), parler de valeur relationnelle postule qu'il y a une quantité de raisons pour donner une valeur à la nature. Les valeurs ne sont pas isolées, mais chaque individu adopte un système de valeurs qui s'articulent les unes avec les autres (Larrère, 2010), valeurs qui se construisent et se hiérarchisent à travers les processus sociaux (Ernstson & Sörlin, 2009). Ainsi, les valeurs relationnelles reconnaissent l'existence du pluralisme des rapports dans les socio-écosystèmes, et ajoutent une sphère collective à la dimension individuelle des réflexions autour des deux premières valeurs. Elles reflètent ainsi des préférences, des principes et des vertus associés aux relations, à la fois interpersonnelles et

¹⁷ La « nouvelle conservation » engendre beaucoup de controverses (voir p.ex. Cafaro & Primack, 2014; Kirby, 2014; Marris, 2014; Marvier, 2014; Marvier & Kareiva, 2014; Miller, Soulé, & Terborgh, 2014; Spash, 2015). Ses détracteurs reprochent à ses promoteurs d'accepter la croissance économique malgré l'extinction des espèces ; en effet, les réflexions au-tour de la nouvelle conservation donnent une place importante au travail avec des grandes entreprises et des multinationales, et ne donnent pas d'importance à l'extinction d'espèces qui n'ont pas d'effets sur les êtres humains (Kareiva, McNally, McCormick, Miller, & Ruckelshaus, 2015; Kareiva & Marvier, 2012).

¹⁸ En citant Kareiva et Marvier (2012 :968) « *we are advocating conservation for people rather than from people* ».

articulées par les politiques publiques et les normes sociales. Comme Chan et al. (2016) le soulignent, les valeurs relationnelles ne sont pas directement liées aux caractéristiques des éléments, mais elles dérivent des rapports et des responsabilités envers eux. Certaines éthiques ou pratiques de l'environnement reflètent bien les valeurs relationnelles, telles que le *Sumak kawsay*¹⁹ (Altman 2016, Damian 2013), la solidarité écologique²⁰ (Mathevet, 2012), l'éducation relative à l'environnement²¹ (Sauvé & Villemagne, 2005), l'intendance environnementale²² ou l'éthique du « care » (Laugier, 2015; Paperman & Laugier, 2005).

Je vais me servir de la réflexion sur le *care*²³ pour expliquer les valeurs relationnelles. Le *care* en tant qu'activité a été défini comme « *une activité caractéristique à l'espèce humaine qui inclut tout ce que nous faisons en vue de maintenir, de continuer ou de réparer notre « monde » de telle sorte que nous puissions y vivre aussi bien que possible. Ce monde inclut nos corps, nos individualités (selves) et notre environnement, que nous cherchons à tisser ensemble dans un maillage complexe qui soutient la vie* » (Tronto & Maury, 2015). Pour la philosophe française Sandra Laugier (2009), le *care* a été défini en tant que pratique ou théorie morale qui recherche un équilibre entre le souci de soi et le souci des autres ; elle considère que s'il y a une articulation possible entre *care* et environnement, ce sera dans la reconnaissance ordinaire de nos dépendances et de nos responsabilités. Le *care* recentre la

¹⁹ Expresion Kichwa, traduite en Espagnol par « Buen Vivir » ou « Bien vivre » en Français, c'est la satisfaction des besoins fondamentaux des êtres humains, en vivant en harmonie avec la nature (Altmann, 2016; Damian, 2013)

²⁰ Il s'agit d'une éthique du vivre-ensemble qui enjoint de bien se comporter dans les communautés biotiques dans lesquelles on intervient (et dont on fait partie) (Mathevet, 2012)

²¹ « L'éducation relative à l'environnement s'intéresse plus spécifiquement au rapport à Oikos, à cette maison de vie partagée où les relations d'altérité s'ouvrent à l'ensemble des formes et des systèmes de vie. Elle se préoccupe de reconstruire le réseau des relations entre personnes – groupe social – environnement, à même la trame d'un réseau de valeurs qu'il importe d'explicitier, de remettre en question, de justifier, de transformer ou de consolider » (Sauvé & Villemagne, 2005).

²² Traduit de l'anglais « *environmental stewardship* », et aussi connu comme « *civic ecological practices* » (pratiques écocitoyennes), se réfère à la responsabilité d'agir pour (de s'impliquer pour) l'environnement (Andersson et al., 2014; Krasny, Crestol, Tidball, & Stedman, 2014)

²³ Concept anglais, généralement traduit en français par « soin », « sollicitude » ou « souci » (Paperman & Laugier, 2005).

réflexion morale sur les relations entre les agents – *care giver* et *care receiver*- plutôt que sur l'action morale. Il s'agit moins de soumettre une action à une règle²⁴ que de manifester une attention à l'autre, un souci pour l'agent avec lequel on est en interaction. C'est pour cela que les penseurs du *care* essayent de montrer comment les échanges sociaux ou affectifs révèlent ce qui compte pour les acteurs, que ce soit à l'occasion d'expériences positives ou négatives (Beau 2017 : 272).

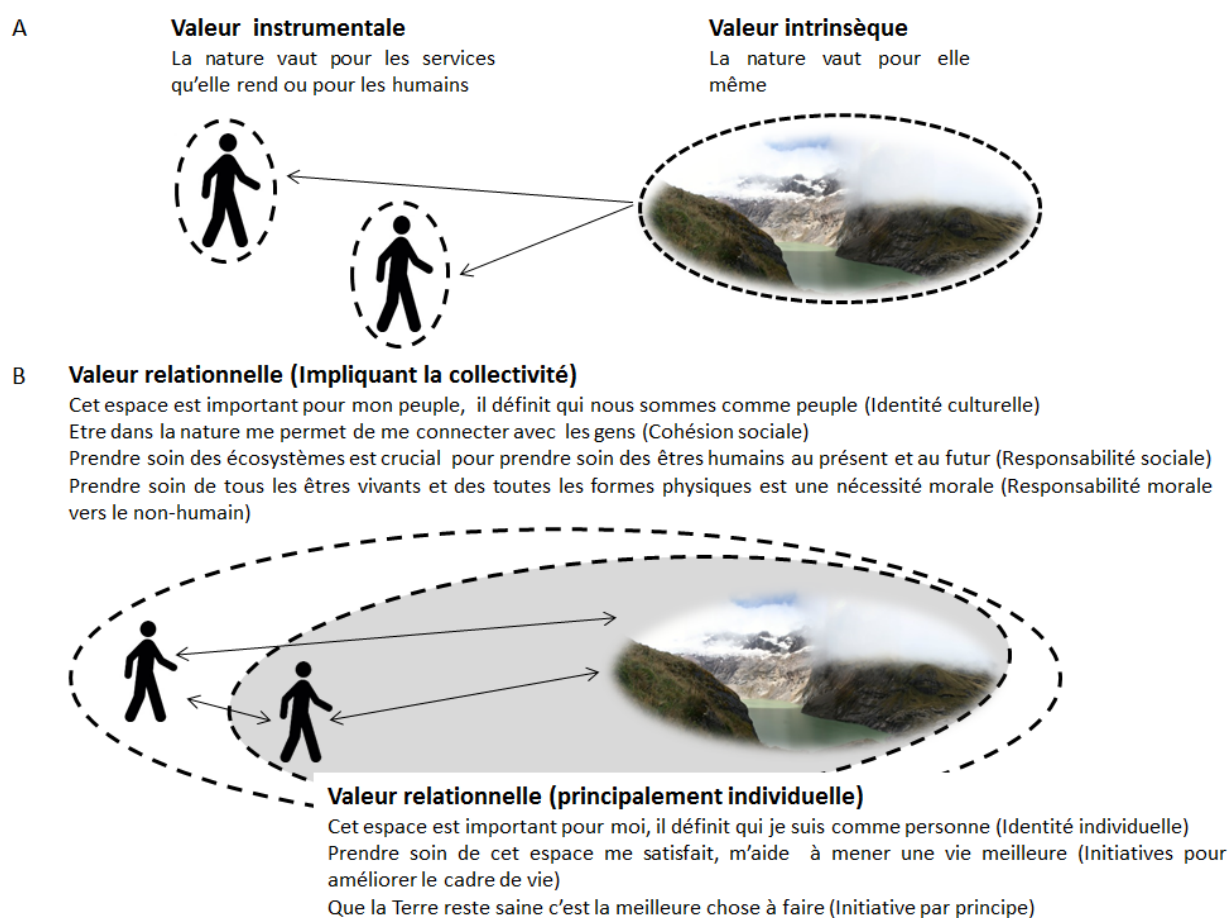


Figure 2. Valeurs instrumentales et intrinsèques (dominantes dans la littérature) et valeur relationnelle. (A) La valeur intrinsèque fait référence à la valeur inhérente à un objet et la valeur instrumentale fait référence à la valeur de l'objet pour les gens. (B) La valeur relationnelle concerne tous les types des relations entre les êtres humains et la nature, en incluant les relations entre personnes qui impliquent la nature (figure adaptée et traduite de Chan et al., 2016).

²⁴ La réflexion sur le *care* va à l'encontre de la « pulsion de la généralité », le désir d'énoncer des règles générales de pensée et d'action (Laugier, 2009).

4. *Les rapports à la nature en ville*

Penser les liens entre valeurs relationnelles et la conservation de la nature peut se faire en général ou en fonction des contextes et des systèmes socio-écologiques où ceux-ci prennent place. Parmi tous les lieux qui hébergent des relations entre les humains et la nature, les villes occupent une place particulière. En effet, c'est en ville que les pouvoirs politiques et économiques sont concentrés, c'est dans des villes que les politiques publiques sont façonnées, qui ont des impacts sur les socio-écosystèmes autant urbains que ruraux. C'est également en ville que la majeure part de l'humanité vit (United Nations, 2015). Toutes ces raisons expliquent que les villes représentent des arènes clés pour comprendre les rapports entre les êtres humains et leur environnement, et les actions de conservation associées.

a) La ville, un socio-écosystème

La représentation sociale de la ville est souvent antagonique à celle de la nature (Cavin, Ruegg, & Carron, 2010). D'ailleurs les travaux portant sur la ville ont souvent conçu la question urbaine comme l'antithèse de la question environnementale (Coutard & Lévy, 2010), de telle sorte que les processus d'urbanisation dominants ont façonné les villes comme des grands fournisseurs de commodités variées, telle que des restaurants, des théâtres, des services publics, du travail, etc. (Glaeser, Kolko, & Saiz, 2000). Ces processus sont associés à un grand nombre d'inconvénients, tels que le trafic routier, la pollution atmosphérique, les rythmes de vie accélérés ou des relations personnelles limitées (Davies, 2015), ainsi que des espaces verts peu nombreux ou de surface réduite (Richards, Passy, & Oh, 2017).

Il a été suggéré que cette représentation de la ville, en combinaison avec les modes de vie associés, empêche les citoyens d'avoir accès à des expériences de nature quotidiennes. Ce phénomène nommé « extinction des expériences [de nature] » (Pyle, 1978, 2003) est négati-

vement associé avec les attitudes, émotions et comportements vers la nature ainsi qu’avec le bien-être des humains (Miller, 2005; Soga & Gaston, 2016).

Sans disparaître, cette image antagonique ville/nature entre en concurrence avec d’autres représentations et initiatives où ville et nature ne s’opposent plus forcément (Cavin et al., 2010) : la mise en place de jardins partagés, l’aménagement des berges, l’exploitation de ruches en ville ou les trames vertes et bleues en sont quelques exemples. Ces initiatives invitent à penser la ville dans la biosphère et non pas hors de la biosphère, elles témoignent des interconnexions complexes entre les dimensions sociales et écologiques de la vie, elles amènent à penser la ville comme un socio-écosystème. De plus, ces initiatives suggèrent qu’au lieu de s’éteindre, les expériences de nature se transforment (Clayton et al., 2017) (voir le chapitre 1 pour une conceptualisation des expériences de nature).

b) Implications sur la conservation

Parler de conservation en ville implique de prendre en compte les interactions entre les humains, les autres organismes vivants, les institutions, les communautés et les écosystèmes dans lesquelles tous cohabitent, de reconnaître les interdépendances entre toutes les dimensions socio-écologiques urbaines. Par exemple, les services écosystémiques disponibles en ville²⁵ sont le résultat de processus sociaux et politiques qui modèrent et décident la génération de ces services (Ernstson, 2013). Ce processus implique à la fois une planification urbaine (p.ex. d’utilisation et de gestion des terres : (Andersson, 2006; Wilkinson, Saarne, Peterson, & Colding, 2013) et une volonté d’agir de la part de citoyens, les *stewards* (Andersson et al., 2014), qui favorisent des fonctions écologiques. Par exemple, des études sur les processus de pollinisation et de dispersion des semences en ville (deux processus importants pour la

²⁵ Services de soutien (p. ex. favoriser le cycle de l’eau ou favoriser la biodiversité), services culturels (p. ex. récréation, cohésion sociale), services d’approvisionnement (p.ex. fournir de la nourriture ou de l’eau), services de régulation (p. ex. purification de l’eau ou régulation du climat) (Luederitz et al., 2015).

production agricole et la régénération des forêts et de la biodiversité en général) montrent que ceux-ci ne dépendent pas seulement des animaux présents en ville, mais aussi d'une utilisation des terres qui permet l'installation de la flore et la faune, ses déplacements et l'accès aux ressources ; ils dépendent aussi des connaissances des humains sur la gestion et les pratiques, ainsi que des réseaux et des institutions qui défendent les espaces verts dans lesquels ces processus peuvent avoir lieu (Andersson, Barthel, & Ahrné, 2007; Barthel, Folke, & Colding, 2010).

c) L'exemple des jardins partagés

A la fin des années 1990 les jardins partagés naissent en France inspirés des jardins de communautés²⁶ d'Amérique du Nord. Ces années ont été marquées par un discours environnemental global (voir la déclaration de Rio de 1992 ou la publication de la Charte de la Terre en 2000) qui a insisté sur notre appartenance commune à une planète dont les ressources sont limitées et a souligné une inquiétude sur la façon dont les modes de production et de consommation causent des dommages considérables à l'environnement. Dans ces années s'imposent ainsi sur la scène publique une critique écologique et sociale de l'agriculture productiviste²⁷, ainsi qu'une défiance à l'égard des produits issus de ce modèle agricole²⁸.

²⁶ Connus en anglais comme « *community gardens* ».

²⁷ L'agriculture productiviste est issue d'une modernisation de l'agriculture due « d'une part à la généralisation de la mécanisation et de la motorisation et, d'autre part, à l'application des résultats des recherches scientifiques, notamment par le recours aux produits phytosanitaires et par la création de semences améliorées » (Beau 2017 :32). Des critiques sur ce modèle agricole ont commencé déjà dans les années 1960 quand l'ouvrage « *Silent Spring* » (publié pour la première fois en 1962) introduit sur la scène publique la réflexion sur les effets indésirables de l'épandage massif d'engrais chimiques et de produits phytosanitaires dans les champs (Carson, 2012) ; suite à cet ouvrage, des études révélant les impacts négatifs des nouveaux intrants sur les eaux, les sols et les animaux se sont multipliées (pour une synthèse des études sur les impacts des pesticides voir: Institut national de la recherche agronomique (France) & Centre national du machinisme agricole, 2011). Dans les années 1970 le rapport Meadows introduit l'idée que la disponibilité en ressources naturelles pourraient limiter notre croissance (Club de Rome, 1972) et des critiques sur la consommation importante d'énergies non renouvelables de la part de l'agriculture productiviste sont émises (Pimentel et al., 1973). C'est dans les années 1970 qu'une remise en cause plus large de la trajectoire empruntée par le développement industriel a soulevé l'idée que notre puissance technique pourrait se retourner contre nous et dégrader l'état de la planète entière (Jonas, 2013) (publié pour la première fois en 1979). En plus, ce modèle agricole a été accusé de marginaliser la paysannerie traditionnelle, d'aggraver les inégalités sociales notamment au sein des populations rurales surtout des pays du sud global et d'avoir placé ces derniers dans une situation de dépendance (Shiva, 1992).

En 1996, des associations françaises comprenant notamment des militants écologistes et des animateurs socioculturels se rendent à Montréal pour assister à l'assemblée générale des jardins communautaires et en visiter un certain nombre. En 1997 s'organise à Lille le premier forum national « Jardinage et citoyenneté », duquel naît le réseau « Le jardin dans tous ses états », soutenu par la Fondation de France, qui entend favoriser les échanges entre les jardiniers et les élus et techniciens de collectivités locales. Le dialogue entre les acteurs se concrétise par la rédaction de la charte « La Terre en partage » (voir annexe 1), qui affirme une série de valeurs communes telles que la créativité, la solidarité, l'aide aux personnes en difficulté, la responsabilité envers l'environnement ou la nécessité de renouer des liens avec le monde vivant. La même année, la Fondation de France lance un l'appel à projets « De nouvelles natures à cultiver ensemble », dont le but est de financer des jardins associatifs durant cinq ans.

En 2003 un projet de loi réformant le Code rural définit les jardins partagés comme « *des jardins créées ou animés collectivement, ayant pour objet de développer des liens sociaux de proximité par le biais d'activités socioculturelles et étant accessibles au public* »²⁹. Cette proposition cherche à donner à ces jardins un statut légal, mais ce projet n'a jamais abouti³⁰.

Différentes municipalités (p. ex. Montreuil, Montpellier, Paris, Lyon) ont développé des programmes cherchant promouvoir la création de nouveaux jardins mais aussi encadrer des initiatives des jardins partagés déjà existantes, qui s'installaient dans des terrains vacants et colonisés. A Paris par exemple, le programme « Main Verte » a été voté par le Conseil de Paris

²⁸ Due aux crises sanitaires de l'industrie agroalimentaire de la fin du XXe siècle : la « crise la vache folle » à partir de 1996, les épidémies successives de listériose de 1987, 1992 et 1999, les controverses sur les « poulets à la dioxine » ou celles des « bœufs aux hormones » (Beau 2017 : 51). D'un point de vue sanitaire, ce modèle agricole a été aussi critiqué car les méthodes qu'il met en œuvre seraient porteuses de risques pour la santé humaine, tant chez les consommateurs que chez les professionnels du monde agricole (Jas, 2007).

²⁹ [En ligne] URL : <http://www.assemblee-nationale.fr/13/propositions/pion0044.asp>. Consulté le 13/08/2017

³⁰ [En ligne] URL : <https://www.senat.fr/dossier-legislatif/ppl01-368.html>. Consulté le 27/09/2017

en 2003. Ce programme a été élaboré par l'association « Graines de Jardins »³¹, suite à un appel d'offre de la Mairie de Paris. Il demande aux parties prenantes de signer une convention d'occupation et d'usage du terrain concerné (voir annexe 2), qui officialise la gestion d'un jardin partagé par un groupe d'habitants d'un quartier regroupés en association. Cette convention précise la durée d'occupation du terrain, les activités et objectifs de l'association et ses obligations ainsi que son domaine de responsabilité. La convention indique également les apports de la part des services municipaux (p. ex. les travaux les plus lourds comme l'adduction d'eau ou l'apport de terre). Parallèlement à cette convention, les membres de l'association signent la charte Main Verte (voir annexe 3), laquelle précise les principes des jardins partagés (p. ex. démarche participative, création du lien social, respect de l'environnement) et les engagements de l'association (p. ex. l'ouverture du jardin au public au moins deux demi-journées par semaine en présence d'un membre de l'association, l'organisation des événements ouverts au public, la communication sur le jardin et ses activités, une gestion écologique). Certains jardins partagés ne se situent pas sur des terrains municipaux, mais sur des terrains conventionnés par la Mairie ou sur des terrains privés. Dans ces deux cas, la signature de la charte main verte n'est pas systématique.

Les terrains où les jardins s'installent sont souvent en attente d'affectation urbanistique, ce qui peut rendre l'installation de ces jardins précaire. Leur taille est extrêmement variable, allant de moins de 100m² (p. ex. le jardin « Les 1001 Feuilles ») à presque 1000m² (p.ex. Le « Jardin de l'Aqueduc »). Il faut noter que ces terrains se trouvent souvent sur des sols pollués (Baudelet, 2015).

Le nombre d'adhérants des jardins partagés varie également beaucoup entre jardins, allant d'une dizaine à plus d'une centaine par jardin. Quand l'association de gestion compte plus

³¹ Association qu'anime le réseau régional des jardins partagés d'Ile-de-France en valorisant leurs initiatives et en créant du lien entre eux. Cette association apporte un appui au montage de projet, à la gestion du jardin et intervient, si besoin, comme médiateur [En Ligne] : URL : <http://www.jardinons-ensemble.org/spip.php?rubrique1#2017-09-07>. Consulté le 07/09/2017.

d'une centaine d'adhérents, il s'agit en majorité de personnes soutenant l'initiative, pas nécessairement impliquées de façon assidue dans les activités de jardinage et les animations autour du jardin. La plupart des jardins sont organisés en parcelles collectives, bien que certains jardins offrent une combinaison de parcelles collectives et individuelles (p. ex. Jardin Hérold, Jardin Périchaux).

Comment reconnaître un jardin partagé ?

Ces jardins sont créés de façons diverses et particulières qui répondent aux caractéristiques du lieu ainsi qu'aux besoins et envies de leurs utilisateurs, ils présentent donc une multiplicité de formes (Figure 3). Cependant, certains signes tels que la présence d'hôtels à insectes, de composteurs, de nichoirs, de cabanes à outils ou de décorations artistiques aident à les reconnaître³². Ces signes sont le produit de la participation dans les jardins et portent donc la mémoire socio-écologique³³ du lieu (Barthel et al., 2010). Si chaque jardin est caractérisé par un usage spécifique de son terrain, la plupart d'entre eux ont cependant des parcelles potagères, des parcelles ornementales ou une combinaison des deux, une mare et des cultures hors sol qui permettent d'éviter tout contact avec des terres polluées, ou qui permettent à des personnes à mobilité réduite de faire aussi de jardinage (Figure 4).

³² Ces jardins sont souvent limités par une clôture installée pour éviter des vols de matériel du jardinage ou des plantes et fruits des jardins ainsi que pour éviter le vandalisme. La présence de ces clôtures donne parfois une vision erronée des jardins comme étant de la propriété privée (Baudry, Scapino, & Rémy, 2014)

³³ La mémoire socio-écologique est la mémoire concernant la gestion d'un écosystème (Barthel, Folke, & Collding, 2010).



Figure 3. Multiples formes des jardins partagés : a) Jardins du Ruisseau, b) Jardin des Deux Lauriers, c) Jardin Clos des Blancs Montaux, d) Jardin sur le toit, e) Jardin Hérold. ©Ana Cristina Torres.



Figure 4. Exemples de signes spécifiques rencontrés dans des jardins partagés : a) hôtel à insectes, b) cabane à outils, c) culture hors sol et d) mare. ©Ana Cristina Torres.

OBJECTIFS DE LA THESE

Dans cette introduction nous avons mis en avant le caractère non fixé des cadres conceptuels proposés au cours du temps pour penser la conservation de la nature. Ces cadres ont été essentiellement mobilisés dans des discours autour des valeurs intrinsèques et des valeurs instrumentales (Mace, 2014) ; leurs détracteurs regrettent qu'ils laissent de côté une partie des personnes concernées et qu'ils considèrent comme universelle la conception de la nature sur laquelle ils reposent alors même que c'est une conception issue des visions dites occidentales du monde (Escobar, 2011 ; Hache, 2012). Or la complexité des questions environnementales en lien avec la dégradation continue de la biosphère (p. ex. la perte de la biodiversité et l'extinction des espèces, la pollution, l'exploitation démesurée des ressources naturelles, etc.) ont permis de constater les limites de ces cadres d'analyse pour susciter des engagements pour la nature (van den Born et al., 2017). Il semble que ces limites soient en partie liées au fait que ces discours ne sont pas en accord avec les motivations des citoyens pour s'engager dans des initiatives de conservation. Dans ce contexte, il est nécessaire trouver des arguments qui soient recevables par chacun dans sa propre conception morale, et donc d'enrichir de la sorte l'argumentation en faveur de la nature. Ma thèse s'inscrit dans cet objectif. En m'appuyant sur la notion de valeurs relationnelles ainsi que sur celle des transformations des expériences de nature, j'ai conduit un travail qui veut apporter une réflexion complémentaire aux manières de concevoir la conservation de la nature.

Cette thèse est organisée en cinq chapitres articulés autour de la question centrale du rôle des initiatives citoyennes dans la conservation de la nature.

Chapitre 1 : Analyse théorique sur la transformation des expériences de nature

Le premier chapitre est une exploration théorique qui cherche à approfondir les réflexions autour du concept d'expérience de nature (Miller, 2005; Pyle, 1978, 2003; Soga & Gaston,

2016). Ce concept est mobilisé dans la littérature notamment au travers de l'hypothèse d'extinction de l'expérience [de nature], présentée la plupart du temps comme la perte de contact individuel avec la nature. Dans un article collaboratif³⁴ publié dans la revue *Conservation Letters*, nous proposons que l'expérience de nature ne se limite pas aux simples contacts avec la nature, mais serait un processus complexe et divers qui affecte les personnes. Ainsi, au lieu d'une extinction de l'expérience reliée à la diminution des opportunités et des envies d'aller dans la nature, les sociétés suivant un modèle de vie dit occidental pourraient plutôt vivre des transformations des expériences de nature, liées à l'apparition de nouveaux modes de vie. Cet article constitue le socle de mon travail de thèse.

Chapitre 2 : Analyse des spécificités de l'intendance environnementale pour répondre à des défis socio-écologiques

Au travers d'observations participantes dans dix jardins partagés des départements de Paris et Seine-Saint-Denis et d'entretiens approfondis auprès de trente participants de ces jardins, j'ai exploré la façon dont les jardins partagés permettent aux participants de faire face à des inconvénients personnels, sociaux ou environnementaux tels que le chômage, des relations personnelles limitées ou une envie d'expériences de nature. J'ai montré également que les jardins partagés sont des arènes pour de nouvelles expériences de nature individuelles et collectives. Ces expériences font de ces jardins des espaces pour cultiver des valeurs relationnelles, un souci (ou *care*) de soi, mais aussi des autres, des lieux et de la nature.

³⁴ Tous les auteurs, mentionnés par ordre alphabétique ont contribué de façon égale à cet article.

Chapitre 3 : Analyse de la diversité fonctionnelle et spécifique de la flore spontanée présente dans les jardins partagés

Les entretiens réalisés avec les jardiniers (chap. 2) ont montré que la plupart des jardiniers n'avaient pas une représentation négative des plantes considérées comme des « mauvaises herbes », c'est-à-dire la flore spontanée ; certains évoquaient même ces dernières comme des adventices ou des opportunistes. Ce constat, joint à l'absence d'études réalisées sur la présence de flore spontanée dans ces jardins, nous a motivés pour explorer le rôle de la gestion des jardiniers sur la richesse fonctionnelle et spécifique de cette flore. Nous avons montré que les jardins partagés accueillent une flore spontanée composée essentiellement d'espèces communes généralement pérennes avec des préférences environnementales généralistes, leur conférant une certaine flexibilité. Presque un quart des espèces présentes sont pollinisées exclusivement par des insectes. Notre étude a montré que la présence de cette flore est favorisée par une gestion des jardins fournissant une hétérogénéité des habitats. De plus, nous avons mis en évidence un effet de l'âge du jardin sur la richesse fonctionnelle et spécifique de la flore spontanée, mais aucun effet de la surface du jardin. Ces résultats soulignent l'importance des jardins partagés, quelle qu'en soit la surface, pour le maintien d'une flore spontanée en ville. Ils montrent aussi que l'installation de cette flore n'est pas immédiate puisqu'elle dépend de l'âge du jardin, ce qui pourrait encourager les décideurs politiques à permettre l'installation de ces jardins pour de longues durées.

Chapitre 4 : Analyse sur la place donnée aux jardins partagés par les riverains

Une revue de la littérature a mis en évidence le manque d'études concernant les points de vue des riverains sur les initiatives des jardins partagés. C'est pourquoi dans le quatrième chapitre nous nous sommes questionnées sur la connaissance, les perceptions et la participation des riverains vis-à-vis des jardins partagés. Une étude par questionnaires auprès de 431 riverains

suggère que ces jardins, connus d'une partie des riverains, attirent surtout des résidents déjà engagés dans d'autres efforts environnementaux ou civiques. La plupart des résidents apprécient le jardin partagé de leur quartier même s'ils n'en sont pas familiers. Ces résultats montrent que ces initiatives sont appréciées par le voisinage, notamment parce que les résidents d'un quartier sont au courant des bienfaits de ces jardins pour eux, pour le quartier et pour améliorer la ville.

Chapitre. 5 : Analyse de la fermeture d'un jardin partagé et de ses implications sur la conservation de l'environnement

Dans le cinquième et dernier chapitre, j'ai analysé les processus déclenchés par l'ouverture et la fermeture d'un jardin partagé. J'ai mis en jeu des méthodes d'observation participante, des entretiens approfondis et l'analyse d'archives, pour suivre et comprendre le processus de fermeture du jardin *Les pouces verts* du Pré-Saint-Gervais, commune limitrophe de Paris. J'ai constaté que la mise en place et l'entretien d'un jardin partagé est un processus continu dans lequel des expériences socio-écologiques sont façonnées, produites et négociées. La construction de ce jardin a permis à ses jardiniers de revitaliser leur quartier, de gérer l'espace urbain et d'avoir une influence sur la qualité de l'écosystème urbain. La fermeture du jardin a mobilisé les jardiniers et des citoyens supporteurs du jardin pour défendre cet espace ainsi que les relations socio-écologiques qui y ont lieu. Cette étude révèle que la conservation de l'environnement est pour certains habitants une recherche de qualité de vie, ce qui explique que la fermeture de ce jardin a été considérée comme un conflit environnemental urbain.

Le processus continu de la mise en place et l'entretien de ce jardin produit un fort attachement au lieu, important pour ces supporteurs, et qui apparait négligé dans le discours des décideurs politiques qui propose une compensation pour les jardiniers sous la forme d'autres terrains à

jardinier. Ces politiques de compensation minimisent la complexité des processus et relations socio-écologiques qui comprennent l'attachement au lieu.

Chapitre 1

*Transformation of experience: toward a new relationship with nature*³⁵

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(Conservation letters, 2017)

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³⁵ [En ligne] URL : <http://onlinelibrary.wiley.com/doi/10.1111/conl.12337/epdf>

Abstract

Despite decades of awareness about the biodiversity crisis, it remains a wicked problem. Besides preservation and restoration strategies, one approach has focused on increasing public concern about biodiversity issues by emphasizing opportunities for people to experience natural environments. In this article, we endeavor to complicate the understanding of these experiences of nature (EoN). Because EoN are embedded in social and cultural contexts, transformative or new EoN are emerging in combination with societal changes in work, home, and technology. Policies that acknowledge and accept a diversity of culturally situated EoN, including negative EoN, could help people reconnect with the complexity and dynamics of biodiversity. A new conceptualization of EoN that encompasses diverse experiences and reflects the sociocultural context could help to stimulate a broader transformation in the relationship between society and nature, one that better integrates the two spheres. Such a transformation is necessary to more effectively address the biodiversity crisis.

Keywords: conservation; biodiversity; attitudes; values; social context; experience of nature

Introduction

Over 30 years of awareness about the biodiversity crisis have not yet effectively addressed the problem (Mace *et al.* 2010). The urgency of this crisis requires significant societal innovations, notably in conservation communication, policies, and governance (see the Aichi targets, Mace *et al.* 2010). In this context, a growing amount of research, recently reviewed and summarized by Soga & Gaston (2016), addresses the decreasing human

experience of nature. According to this formulation, societies that follow a Western way of life face a reduction in both opportunities and the desire to encounter nature, leading to a progressive disaffection. This so-called “extinction of experience,” a phenomenon described over 20 years ago by Robert Pyle (1993/2011), is presented as having deleterious consequences not only for human well-being and health, but also for people’s emotional, attitudinal, and behavioral relations to nature and biodiversity (Soga & Gaston 2016). This hypothesis is appealing to the conservationist community, because it suggests that attention to human needs may help to address the biodiversity crisis, thus avoiding politically difficult tradeoffs between human and ecological values. Indeed, experiencing nature is positively related with knowledge (e.g., ecological literacy; Pilgrim *et al.* 2008), attitude (e.g., environmental concern; Clayton & Myers 2015), and behavior (e.g., activism; Chawla 1998) toward biodiversity.

We agree with earlier writers that there has been a troubling reduction of interactions between people and the natural environment. However, previous authors have primarily defined experiences of nature (EoN) in terms of individual contact with nature, and generally suggested that the remedy for both humans and ecosystems lies simply in facilitating more opportunities for such contact. In contrast, we argue that EoN are diverse and complex, and are embedded in social and political contexts. Thus, EoN must be seen as a process, including: (1) interactions between individuals and natural entities; (2) social and cultural context; and (3) consequences for new skills, knowledge, or behavioral changes. Rather than being extinguished, EoN are being transformed along with a changing society.

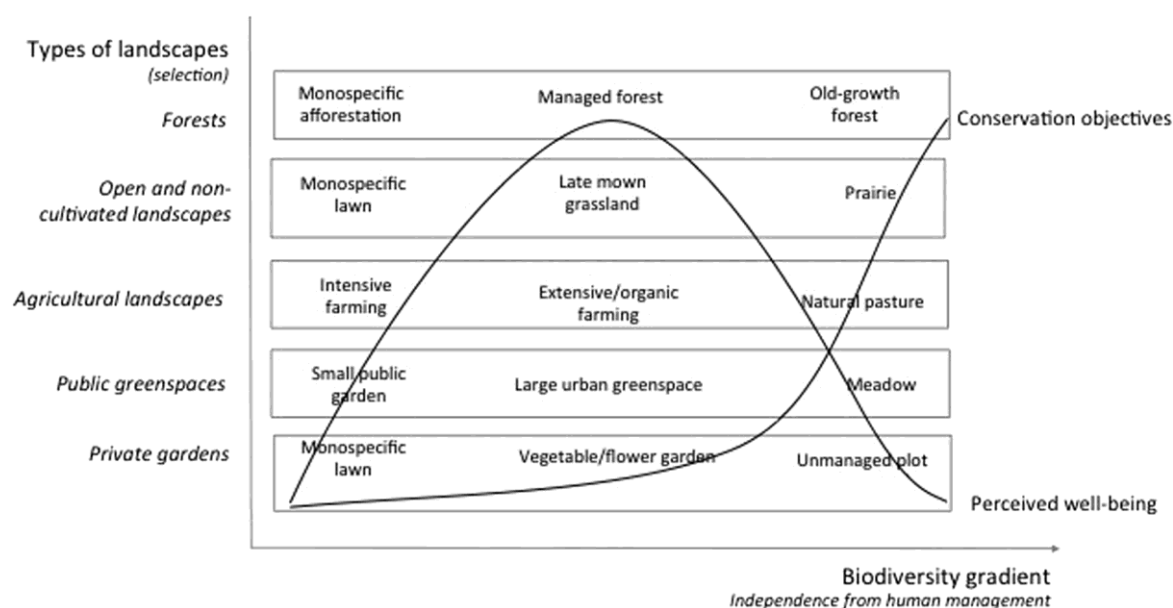
In this article, we advocate a re-examination of the complex human relationship with nature, emphasizing the social context for the experience, which has been relatively neglected (Chan *et al.* 2016). We describe some important dimensions of diverse

EoN and explain why that diversity is significant to the ways people think about nature. Recognizing that EoN have both precursors and consequences, we describe changes associated with a changing society. Finally, we argue that new ways of considering diverse EoN could more effectively address the biodiversity crisis, by leading to a relationship between society and nature that is not based on unrealistic and restrictive assumptions and that encourages people to feel connected to the natural world.

Defining and describing the EoN

“Experience” refers to the “process of getting knowledge or skills from doing, seeing or feeling things,” or to “something that happens to you that affects how you feel” (<http://dictionary.cambridge.org/dictionary/english/experience>). Thus, it is importantly different from mere “contact” with nature, a term that is often used in the literature. Experience should change people, in ways that can ultimately be integrated into individual identity (Clayton 2012). The term “nature,” meanwhile, generally refers to natural phenomena of the physical world, but it encompasses a diversity of cultural conceptions (Kluckhohn & Strodtbeck 1961). As operationalized in conservation research, it may include everything from an urban park to a pristine rainforest. In recognition of the biodiversity crisis, we argue for a definition of “nature” that is flexible according to the social context but that minimizes the degree of human control over the dynamic and evolutionary potential of nonhuman species and ecosystems (Ridder 2007; Figure 1), factors that are crucial components of biodiversity for conservation practitioners and scholars (Soulé 1985).

Figure 1 Different types of nature may promote different objectives.



EON can be described according to the nature that is present (the naturalness, diversity, and dynamic of the landscape), as well as by the way nature is perceived by the experiencing individual. EoN are particularly rich in their ability to engage multiple senses, notably smells, and tactile sensations that are greater in natural than in human built contexts (Kaplan & Kaplan 1989). However, EoN also develop over time as a process in which an experience is interpreted and reinterpreted in coordination with other aspects of the person's life and goals. Because the impact of an experience is mediated by the perceptions of that experience as well as its compatibility with the perceiver's goals (Kaplan & Kaplan 1989), the experience is best described not only by its physical characteristics but also by its immediate social context, shaped by the larger society and culture.

The other people with whom one may share an EoN are often an important component (Chawla 1998); even a solitary experience is shaped by the cultural and social meanings of the event, as well as by its social precursors and consequences. Particular landscapes (e.g., zoos, parks, gardens; Colding *et al.* 2006) do or do not mean "nature" de-

pending on the social groups and societies. Social precursors include economic and demographic indicators that make access to nature easier or more difficult and that suggest that people “belong” or “do not belong” in natural settings (Buijs *et al.* 2009). Social consequences include self-identification or identification by others as, for example, an “environmentalist”; an identification which may be welcomed or rejected (Zavestoski 2003).

With these perceptual and social aspects in mind, we propose an initial list of some dimensions of EoN that deserve attention (Table 1). These represent continuous, not dichotomous dimensions, so that experiences may fall at varying points along the spectrum. This list is incomplete, some of these dimensions may be further subdivided, and some of them are interdependent; however, we present it as a starting point in describing characteristics of EoN that have significant implications for how people will respond to an experience through changes in knowledge, attitude, and behavior. In the following, we briefly discuss each particular dimension in terms of conservation outcomes.

Table 1 Dimensions of nature experiences.

Dimension	Description and examples
Observing vs. interacting	Is the participant an observer, as in someone who watches a bird on the seaside? Or is the participant behaviorally engaged by feeding the bird?
Consumptive vs. appreciative	Is the goal to exploit (and modify) nature as a resource (e.g., by hunting, timbering, fishing), or to simply appreciate it without considering it to be a resource, e.g., by bird-watching?
Self-directed vs. other-directed	Did the participant seek out the experience, for example, by visiting an urban park to see nature, or is it an experience determined by others, such as part of a school program?
Separate vs. integrated	Does the participant have to depart from his or her regular routine to make a special effort to experience nature, or is the encounter integrated within his or her daily life?
Solitary vs. shared	Is the participant alone, or with others who are sharing the experience?
Positive vs. negative	Is the emotional response to the experience primarily positive or negative?

Compared to mere observation, interactive experiences are likely to be more vivid and multisensory, engaging more emotions and creating a more lasting memory. However, such interactions are not always welcomed by conservationists who are concerned about the human impact on nature. Consumptive experiences are more likely than appreciative experiences to have negative impacts on conservation, though long-term sustainable practices may be developed (Cooper *et al.* 2015). Self-directed EON may give people a greater sense of autonomy and control, thus increasing motivation to engage in conservation, but they may offer less opportunity for targeted behavioral changes or specific educational outcomes than formal educational settings or other externally driven contexts. Integrated experiences have greater impact on habits and behavioral routines than those that are separate, as noted in education (Sauvé *et al.* 2001); the distinctiveness of the latter, however, may have a profound cognitive impact by leading people to a new perspective, as suggested by research on transcendent experiences (Vining & Merrick 2012). For many people, indeed, “connecting to nature” is significantly motivated by the desire to “disconnect” or escape from the modern urban environment (Kaplan & Kaplan 1989), and is interpreted by the contrast between the two contexts. Shared experiences help the transmission of values, attitudes, and behaviors toward nature between friends and/or relatives, and contribute to build a social identity and concern toward nature (Chawla 1998). The positive versus negative dimension of experience is particularly significant to our argument. Although many previous authors have emphasized only the positive emotional response to nature, it is essential to also consider negative aspects of EoN. Nature can prompt fear, disgust, and anxiety (Kellert 2014), which sometimes inhibit conservation interest (Knight 2008). Other negative EoN result from a threat of invasion: when mosquitoes collect blood, bugs or rodents enter the household, or wolves kill sheep and other livestock, the expe-

rience feels like a personal violation. The resulting hostility to a species must be recognized in the development of conservation policies. In general, both positive and negative emotions are needed to assess environmental issues accurately (Clayton & Myers 2015). Positive emotions help people to be optimistic, invent a desired future and encourage prosocial behaviors and relationships, but searching for positive emotions alone can encourage people to take short-term and self-centered actions which can be counterproductive for conservation. In contrast, fear can offer opportunities for people to test their own competence and skills (Terrasson 1988). In turn, although guilt can lead people to avoid the situation if it is too intense, it can also motivate efforts to redress a situation. Aldo Leopold's conservation writings (e.g., 1949/1986) suggest that guilt over excessive killing of predators had such an effect on him.

Biodiversity is made up not of "good" and "bad" species, but of interrelated components. A "bad" interaction with nature, particularly when integrated in a broader context of social relationships, can be a reminder that biodiversity is not designed to satisfy human interests and does not conform to an idealized view of nature (Leopold 1949/1986). A combination of positive and negative EoN can alert people to the complexity and unpredictability of biodiversity and lead to humility, an emotion that is often mentioned by people having wilderness experiences (Williams & Harvey 2001).

A wide range of nature experiences is important for individuals to develop a sense of themselves as being a part of the natural world (Chawla 1998), or environmental identity, which in turn increases environmental concern and proenvironmental behavior (Clayton 2012). Moreover, at the social level, nature experiences (even negative ones) promote social bonds and shared values. Indeed, being part of a social group engaged with a common issue, such as biodiversity conservation, can promote self-efficacy and social empowerment important predictors of sustainable behavior as

well as social bonds, which in turn can foster environmental activism, support of or involvement in conservation policies.

EoN must be therefore considered as a process in which individual, social, and natural factors precede the experience, and the experience has outcomes for the person, social group, and biodiversity (Figure 2). Societal innovations in work, family life, and technology, have changed the context and thus have transformed EoN transformations which in turn will affect the larger society. We examine these changes next.

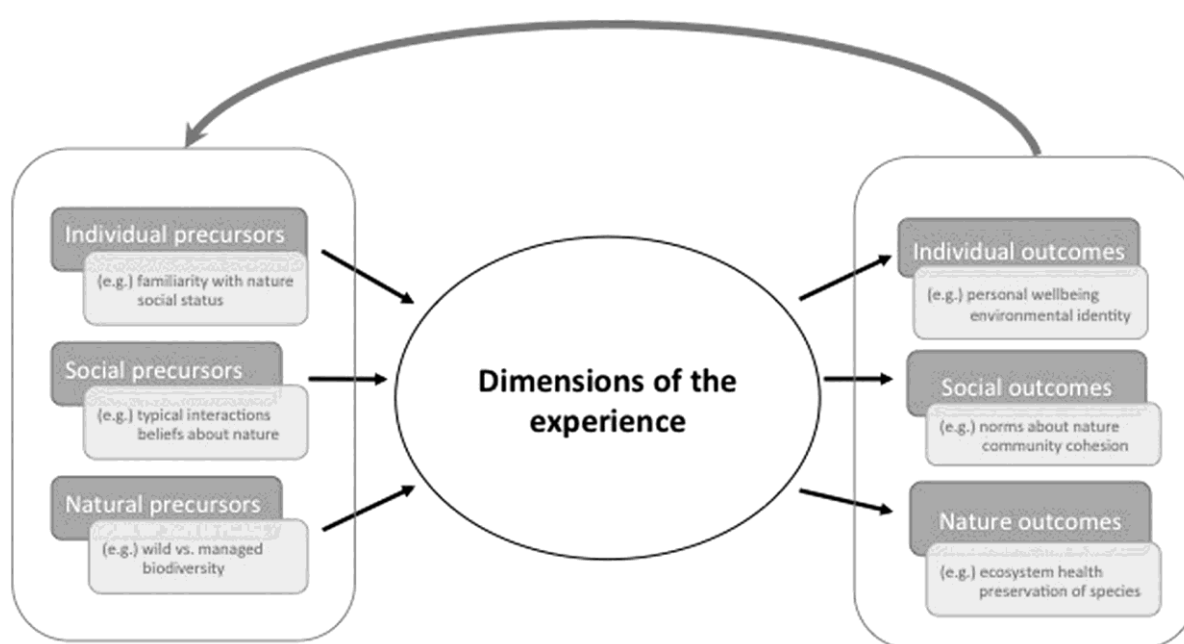


Figure 2 EoN in context, showing precursors and outcomes as well as the feedback loop from outcomes to precursors.

Changing EoN

Many people, including parents, have become concerned by the extinction of EoN (as popularized by Louv 2008), and try to replicate their own EoN for their children (see <http://www.childrenandnature.org>). Similarly, calls by conservation scientists and practitioners to reconnect people with nature suggest a belief that engaging in the same activities (such as playing outside) would lead to the same outcomes for attitudes,

emotions, and behaviors toward nature that were achieved in the past. However, global urbanization and the development of technology, in combination with new ways of working, seeing the world, and consuming, are too different today to allow the experience of earlier generations to be replicated. Viewed within a social context that has experienced profound changes, the extinction of traditional EoN must be seen as an effect of modernity. Most humans no longer need to interact with nature for biological reasons; in parallel, they have lost the associated skills and knowledge (e.g., traditional ecological knowledge) and developed new perceptions of nature and its place in human lives (Pilgrim *et al.* 2008).

These societal changes have transformed the ways in which we collectively experience nature. Novel technology-based interactions allow us to “mediate, augment or simulate the natural world” in order to have symbolic or vicarious EoN (Kellert 2014). Nature-based reality shows, documentaries, and streaming animal cameras create an experience of nature for many modern citizens while they are sitting in their homes; video games even allow people to virtually interact with nature. People can live in isolated, remote places near wild nature while still actively participating in modern life through an internet connection. In western countries, some conventional farmers are able to collect a large amount of data about their farm, use sensors to control their engines remotely and automate almost all their activity without the need to go outside. The impacts of these experiences integrating nature and technology are still unknown, but they will continue to characterize the new EoN. Rather than dismissing these forms as inauthentic, conservation scholars and practitioners should examine the ways in which they help to construct people’s attitudes and behaviors toward nature.

In parallel with these changing interactions, the social construction of nature has also changed. Whereas in the past people encountered nature as a fundamental part of

daily life, intimate and individual, it is now sought out as a managed “experience” that is planned (e.g., touristic or educational experiences) and shared with a wide range of others (e.g., Facebook posts or Instagram uploads). Such EoN are defined and used for specific predictable effects such as individual well-being, satisfaction, escape, and as a method for educating citizens to have the “correct” (i.e., according to the conservation objectives) concerns about nature. With these specific services in mind, EoN can also be easily rejected for having not met the preconceived criteria. As Chan *et al.* (2016) stated, “as a means (instrument) to something else, [nature] is potentially replaceable” (p. 1463). A socially constructed emphasis on positive outcomes of EoN may encourage preference for an idealized and controlled nature rather than one that is both ecologically and culturally diverse.

However, although some types of EoN may be better than others at achieving particular outcomes, the evidence base for describing a “best” experience (including, for instance, conservation and well-being objectives) is still thin (Fuller *et al.* 2007). More important, not all outcomes are equivalent and perhaps not all have even been described (Chan *et al.* 2016). Nature that is managed only for human well-being is not necessarily nature that is best at promoting healthy, dynamic, and evolutionary ecosystems. On the converse, policies that protect nature by isolating it from humans may fail to encourage the public support that is necessary for the long-term conservation of biodiversity (Brockington *et al.* 2006). We join an increasing number of scholars to advocate for renewed conceptualizations of human-nature interactions, based on local specificities and objectives, as long as they reflect respect and value for biodiversity (Ostrom *et al.* 2007). These new EON could help transform the societal relationship with nature, as detailed in the following.

New EON and biodiversity conservation

A restricted experience of nature may lead to unrealistic expectations that leave people disappointed when an experience does not meet the ideal; and a belief that “true” nature is separate from daily human life may leave people feeling that care for nature is neither their responsibility nor within their power. This can explain the widespread disinterest in biodiversity issues, as well as the growing disconnect between conservation policies and othersocial policies (economy, health, security...). Based on our previous argument, we recommend programs that promote nature experiences that are integrated with human lives for everyone, including persons in charge of political or economic issues. This can be accomplished through increased opportunities for people to experience nature and through education to give people the skills they need to understand how to respectfully interact with nature; but also and more innovatively, by acknowledging the diversity of new EoN. Rather than bemoaning the increase in video games, for example, conservation practitioners could (as many are doing) examine ways to link them to conservation efforts, and use social media as a tool to promote conservation caring. A variety of social initiatives have already been developed that simultaneously encourage the conservation of biodiversity, individual empowerment, and social-ecological resilience, such as green architecture, urban community gardens, and adaptive comanagement. For instance, social EoN in community gardens offer learning opportunities that encourage and reinforce certain forms of engagement toward nature and conservation (Krasny & Tidball 2012). It is time to build on these local initiatives to inform efforts that address the crisis at a global level. Just as community-based conservation should recognize the complexity of the ways in which local communities experience nature, and value local knowledge, rather than imposing a restrictive separation between people and the environment, our global efforts to protect nature

need to consider cultural diversity (Ostrom *et al.* 2007; Kothari *et al.* 2013). Different social groups, defined by factors such as religion, ethnicity, and culture, understand and experience nature in different ways and may feel excluded and alienated from policies that assume homogeneous EoN. Besides conservation, new EoN at the collective level will generate social change: new experiences, arising from changing social structures, create new representations, knowledge and skills that are in turn associated with new social arrangements and practices (Weick 1995).

Creating the conditions to encourage socially shared EON requires choices. First, designers and policymakers must provide opportunities for people and social groups to experience nature in its diversity and its unpredictability. Rather than developing techniques that aim to standardize a particular idea or experience of nature, conservation practitioners and other political decision-makers must accept a lack of control over the outcome of these experiences. Second, the goals of environmental education must be expanded: not only to educate people about nature, but also and mostly to educate them about ways to experience nature, in its dynamical complexity. Experiencing nature, including negatively, will help represent nature in a way that is not idealized and disconnected from human lives, but as something of which humans are a part.

In these conditions, new EoN could facilitate multiple outcomes: (1) improved individual well-being, (2) transformed personal identities that recognize the inclusion of nature in self, (3) greater social cohesion, (4) increased individual and collective behaviors that support conservation, and (5) fundamental societal changes. Society, nature, and individual could be experienced as interconnected and not as independent entities. Encouraging new EoN will require conservation scholars and practitioners to accept greater unpredictability in both social and natural trajectories. But the current approach to conservation largely maintains a disjunction between humans and nature that ulti-

mately inhibits successful conservation efforts. The biodiversity crisis requires radical change to ensure that people develop the necessary respect and value for biodiversity.

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References

- Brockington, D., Igoe J. & Schmidt-Soltau K. (2006). Conservation, human rights, and poverty reduction. *Conserv. Biol.*, **20**, 250-252.
- Buijs, A.E., Elands B.H.M. & Langers F. (2009). No wilderness for immigrants: cultural differences in images of nature and landscape preferences. *Landscape Urban Plan.*, **91**, 113-123.
- Chan, K., Balvanera P., Benessaiah K. *et al.* (2016). Why protect nature? Rethinking values and the environment. *P. Natl. Acad. Sci. USA*, **113**, 1462-1465.
- Chawla, L. (1998). Significant life experiences revisited: a review of research on sources of environmental sensitivity. *J. Environ. Ed.*, **29**, 11-21.
- Clayton, S. (2012). Environment and identity. Pages 164-180 in S. Clayton, editor. *Oxford handbook of environmental and conservation psychology*, Oxford, New York.

- Clayton, S. & Myers G. (2015). *Conservation psychology: understanding and promoting human care for nature* (2nd ed.). Wiley-Blackwell, Oxford.
- Colding, J., Lundberg J. & Folke C. (2006). Incorporating green-area user groups in urban ecosystem management. *Ambio*, **35**, 237-244.
- Cooper, C., Larson L., Dayer A., Stedman R. & Decker, D. (2015). Are wildlife recreationists conservationists? Linking hunting, birdwatching, and pro-environmental behavior. *J. Wildlife Manage.*, **79**, 446-457.
- Fuller, R.A., Irvine K.N., Devine-Wright P., Warren P.H. & Gaston K. (2007). Psychological benefits of greenspace increase with biodiversity. *Biol. Letters*, **3**, 390-394.
- Kaplan, R. & Kaplan S. (1989). *The experience of nature: a psychological perspective*. Cambridge University Press, New York.
- Kellert, S. (2014). *Birthright: people and nature in the modern world*. Yale University Press, New Haven, CT.
- Kluckhohn, F.R. & Strodtbeck F.L. (1961). *Variations in value orientations*. Row, Peterson, Evanston, IL.
- Knight, A.J. (2008). "Bats, snakes, and spiders, oh my!" How aesthetic and negativistic attitudes, and other concepts predict support for species protection. *J. Environ. Psychol.*, **28**, 94-103.
- Kothari, A., Camill P. & Brown J. (2013). Conservation as if people also mattered: policy and practice of community-based conservation. *Conserv. Society*, **11**, 1-15.
- Krasny, M. & Tidball, K. (2012). Civic ecology: a pathway for earth stewardship in cities. *Front. Ecol. Environ.*, **10**, 267-273.
- Leopold, A. (1949/1986). *A Sand County almanac*. Ballantine Books, New York.

- Louv, R. (2008). *Last child in the woods - saving our children from nature-deficit disorder*. Algonquin Books, Chapel Hill, NC.
- Mace, G.M., Cramer W., Diaz S. *et al.* (2010). Biodiversity targets after 2010. *Curr. Opin. Environ. Sustain.*, **2**, 3-8.
- Ostrom E., Janssen M. & Anderies J.M. (2007). Going beyond panaceas. *P. Natl. Acad. Sci. USA*, **104**, 15176-15178.
- Pilgrim S., Cullen L.C., Smith D.J. & Pretty J. (2008). Ecological knowledge is lost in wealthier communities and countries. *Environ. Sci. Policy*, **42**, 1004-1009.
- Pyle, R.M. (1993/2011). *The thunder tree: lessons from an urban wildland*. Oregon State Press, Corvallis, OR.
- Ridder, B. (2007) An exploration of the value of naturalness and wild nature. *J. Agr. Environ. Ethic.*, **20**, 195-213.
- Sauvé, L., Orellana I., Qualman S. & Dubé S. (2001). *L'éducation relative à l'environnement. Ecole et communauté: une dynamique constructive*. Hurtubise Editions HMM, Canada.
- Soga, M. & Gaston K. (2016). Extinction of experience: the loss of human-nature interactions. *Front. Ecol. Environ.*, **14**, 94-101.
- Soulé, M.E. (1985). What is conservation biology? *BioScience*, **35**, 727-734.
- Terrasson, F. (1988). *La peur de la nature*. Le sang de la Terre, Paris.
- Vining, J. & Merrick M. (2012). Environmental epiphanies: theoretical foundations and practical applications. Pages 485-508 in S. Clayton, editor. *Oxford handbook of environmental and conservation psychology*. Oxford University Press, New York.
- Weick, K.E. (1995). *Sensemaking in organizations*. Sage, Newbury Park, CA.

Williams, K. & Harvey D. (2001). Transcendent experience in forest environments.

J. Environ. Psychol., **21**, 249-260.

Zavestoski, S. (2003). Constructing and maintaining ecological identities: the strate-

gies of deep ecologists. Pages 297-316 in S. Clayton, S. Opatow, editors. *Identity and the natural environment*. MIT Press, Cambridge, MA.

Chapitre 2

Specificities of French community gardens as environmental stewardships³⁶

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ABSTRACT

Community-based efforts are essential to address urban social–ecological challenges. Here, we focus on French community gardens. Through participant observation and semistructured interviews, this study seeks to provide empirical evidence on: (1) what motivates volunteer gardeners in French community gardens to undertake this activity, (2) what practices take place in the gardens, and (3) which individual and collective processes are associated with gardeners' experiences in the gardens. Through these questions, we aim to understand how these initiatives relate to environmental stewardship. Our results show that environmental, social, and self-motivations are the drivers behind gardeners' participation in the gardens. It seems that involvement in the gardens provides opportunities to fulfill those needs and/or motives through different interrelated processes between the individual with him/herself, the human collective, and nature such as: contemplating nature and benefiting from sensory experiences, having access to environmental education, experiencing individual and collective organization, renewing social–ecological relationships, and facing local challenges. We note that French community gardens provide arenas for new experiences of nature. In addition, even if gardens' biophysical features and gardening practices allow a series of processes that provide social and ecological benefits and outcomes, these gardens refer to environmental stewardship practices by cultivating relational values. These values provide opportunities for innovative ways of creative conservation, reflecting how care for ourselves extends to care for others, for places, and for nature.

Key words: community garden; conservation; environmental stewardship; experience of nature; relational values; urban; well-being

INTRODUCTION

Predominant urbanization processes are followed all over the world by so-called western consumerist values and lifestyles in urban landscapes (Meier and Lange 2009, Harvey 2013). These values and lifestyles tend to show similar social and biophysical features, such as: (1) overdependence of citizens upon cars, which limits personal interactions, generates traffic congestion, and creates public health risks and environmental damages through pollution (Davies 2015); (2) a fast-paced lifestyle, with little time for leisure and contemplation (Davies 2015); and (3) few green spaces, leading to decreasing biodiversity (Richards et al. 2017) and limited ecosystem services (Tratalos et al. 2007). Moreover, the scarcity of urban nature, combined with urban lifestyle, may hinder individual relationships with nature, leading to a phenomenon called “extinction of experience” [of nature] (Pyle 1978, 2003), which is supposed to impact human health and well-being, as well as emotions, attitudes, and behavior toward nature, implying in turn a cycle of disaffection toward it (Soga and Gaston 2016). Clayton et al. (2017) consider that experiences of nature are primarily defined in terms of individual contact with nature and generally recommend that the solution lies in facilitating more opportunities for such contact. The authors recognize that nature experiences are diverse and complex and are embedded in the social and political context, including (1) interactions between individuals and natural entities; (2) social and cultural context; and (3) consequences in terms of new skills, knowledge, or behavioral change (Clayton et al. 2017).

Here, we consider “nature” as a dimension of social–ecological systems; we adhere to a community of scholars who use the term social–ecological systems to qualify the complex interconnectedness among social and ecological dimensions (Berkes and Folke 1998, Folke and Gunderson 2012, Folke et al. 2016).

Community-based efforts have emerged to address social–ecological dynamics in cities. Presented as “environmental stewardship” or “civic ecology” practices, these initiatives involve

interactions between people, other organisms, institutions, communities, and the ecosystems in which these practices take place (Krasny and Tidball 2012). They provide opportunities to respond to social and ecological challenges (Chapin et al. 2010). Among the variety of environmental stewardship practices (e.g., community forestry, tree planting and care), community gardens have probably gained more attention because of the range of expected benefits and outcomes awarded to them (Drake and Lawson 2014). For instance, they can increase local biodiversity (Matteson et al. 2008, Matteson and Langellotto 2011); they can foster environmental learning and combat generational amnesia (Bendt et al. 2013); they can inspire and reinforce some forms of engagement toward nature and conservation (Krasny and Tidball 2012); they can increase nutritional education (Somerset et al. 2005, D'Abundo and Carden 2008); they can procure psychological benefits, mainly by reducing mental fatigue (Kaplan 1973), and promote health (Armstrong 2000); they contribute to individual, household, and community food security (Corrigan 2011); they can improve environmental sustainability (Stocker and Barnett 1998) and sustainable land uses and planning (Irvine et al. 1999); they support social processes and community development (Saldivar-Tanaka and Krasny 2004); they provide opportunities to empower residents to assist in rebuilding their environments, their lives, their sense of place and meaning following natural disasters (Chan et al. 2015). In general, they foster social–ecological system resilience following crises and disaster (Tidball and Krasny 2010a). According to these benefits and outcomes, community gardens join other urban green practices, such as collectively managed parks and allotments, notably because they promote diverse learning streams, environmental stewardship, and social–ecological memory (Colding and Barthel 2013). In the same line, a study conducted in allotment gardens in Stockholm revealed that these gardens provide social–ecological memories of gardening skills and local ecosystems that contribute to ecosystem services and are a source of resilience for the community (Barthel et al. 2010). Likewise, an informal management of allotment gar-

dens fosters ecological knowledge and a sense of place that might have positive effects on local biodiversity and ecosystem services (Andersson et al. 2007).

All these processes are outcomes of environmental stewardship activities and could differ from individual motivations for engaging in such an activity. Numerous researchers have explored people's motivations for volunteering in environmental stewardship, following the framework of functional approach (Bruyere and Rappe 2007, Asah and Blahna 2013, Krasny et al. 2014). Ryan et al. (2001) identified five motivations for volunteer commitment in environmental stewardship programs: environmental help, for instance by restoring natural areas; knowledge, by learning about nature; participation in organized projects; socialization, by joining friends or meeting new people; reflection, which involves personal or emotional benefits. According to Bruyere and Rappe (2007), environmental stewardship can also be deployed by volunteers who wish to act according to their personal values; who wish to gain job-related experience or to explore new possibilities; for fun, because people already enjoy doing these kinds of activities; and just for being outdoors. Asah and Blahna (2012) added to these motivations the possibility to defend and enhance the ego. As a synthesis, Bramston et al. (2011) proposed an "Environmental stewardship motivation scale" with three categories of motivations: (1) a sense of belonging that refers to the sense of community and the social benefits; (2) caretaking the environment, encompassing themes of making an ecological contribution and a responsibility to leave something worthwhile for future generations; (3) expanding personal learning, which refers to ecological facts and skill development. Krasny et al. (2014) completed this scale with social-ecological memories and sense of place.

A review of community gardens studies (Guitart et al. 2012) highlighted the most common motivations for participating in these initiatives: consuming fresh food, social development/cohesion, economic issues, improving health, enhancing cultural practices, increasing

knowledge, increasing land accessibility, enjoying nature, improving environmental sustainability and enhancing spiritual practice.

Considering that most of the research on community gardens has been developed in North America (Guitart et al. 2012) and that civic ecology practices reflect local conditions (Krasny and Tidball 2012), we found it pivotal to explore community gardens in the still largely unexplored French context.

French community gardens

French community gardens (FCG), commonly called “jardins partagés” (which literally translates as “shared gardens”), are increasingly popular initiatives in France. For instance, in Paris, their number increased from fewer than five in 2002 to 113 in October 2016. They emerged at the end of the 1990s (Baudefet et al. 2008), in an historical context of global enthusiasm about the environment and sustainable development. Some of them have been set up informally, occupying vacant land owned by public or private sectors, but some municipalities (e.g., Paris, Lyon, Lille, Nantes, Montpellier) have also developed programs to frame their setting (Baudefet et al. 2008). In Paris, dedicated sites are mostly vacant lands temporarily abandoned, before a new assignation or a planned construction. These sites are managed by an association, where the number of associates can range from a dozen to more than 100 persons (but in that case, associates support the initiative but do not necessarily participate in the garden activities). The designated association signs an official agreement with local authorities or landowners, which specifies the modalities of occupancy and use of the dedicated vacant land, activities, and objectives of the association (e.g., garden management, activities planned), duties of the association (e.g., organize activities for the public, respect the neighborhood, favor ecofriendly practices, avoid planting large trees or shrubs, keep the garden in “good” condition and clean) and duration of the agreement (generally 1 year, extendable up to

5 years). Municipality duties are also stated in the convention (e.g., provide equipment, adapted soil, water supply, garden enclosing) (Mairie de Paris 2012a). In addition, the association must sign the agreement “Charte Main Verte” (roughly translated as “Green Thumb Charter”) and implement participatory frameworks to increase social cohesion and environmental respect (Mairie de Paris 2012b). In this political context, FCG are managed collectively by volunteers with nonprofit goals to grow flowers and/or edible plants. Although they are public, their enclosure makes their status ambiguous between public and private (Baudry et al. 2014), even though gardeners must ensure their opening at least twice a week, and the opening and closing hours as well as garden information must be displayed.

This study addresses the issue of how FCG relate to environmental stewardship. To do so, we seek to provide empirical evidence on: (1) what motivates volunteer gardeners in French community gardens to undertake this activity, (2) what practices take place in the gardens, and (3) which individual and collective processes are associated with gardeners’ experiences in the gardens. We define a process as a series of actions or events that happen naturally or are taken to produce something or achieve a result (<http://dictionary.cambridge.org/dictionary/english/process>).

METHODS

Study sites

The Ile-de-France region hosts most of the community gardens in France, and within this region, Paris and Seine–Saint-Denis are the departments with the greatest number of gardens (Graine de Jardins 2016). Based on a preliminary mapping of all community gardens in both departments, we selected the study gardens based on their age, location, surface area, organizational structure (individual and/or collective plots), and status (perennial or ephemeral). We eventually studied seven gardens in Paris and three gardens located in the western part of the

Seine–Saint-Denis Department, respectively in Pré-Saint-Gervais (one garden) and in Montreuil (two gardens) (Fig. 1). The three cities represent high population density: around 21,100 inhabitants per square meter in Paris, more than 25,500 in Pré-Saint-Gervais and 11,600 in Montreuil (Institut national de la statistique et des études économiques (INSEE) 2013).

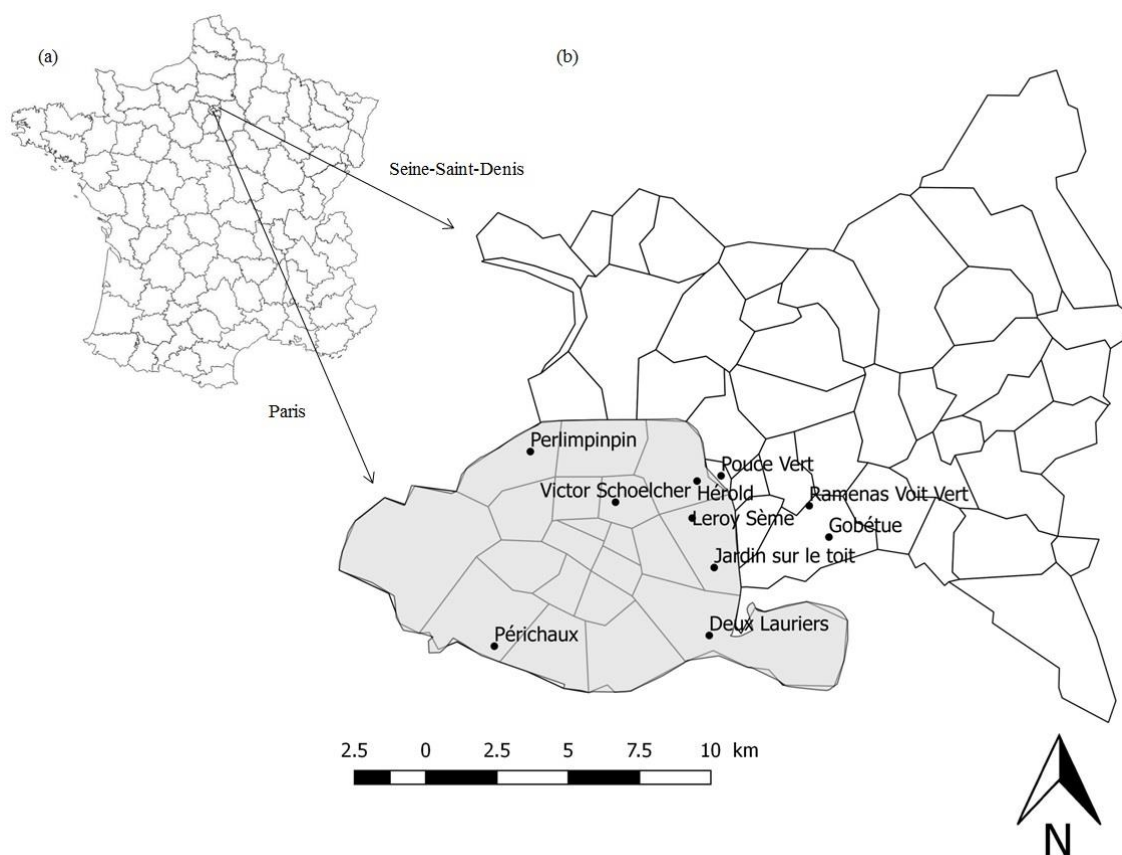


Fig. 1. (a) Map of France showing the location of the departments Paris and Seine-Saint-Denis. (b) Study community gardens in both departments. Paris (in grey) is divided in 20 sectors (“arrondissements”); the Seine-Saint-Denis department (in white) is divided in cities.

The 10 studied community gardens differ in their features (Table 1), notably in their surface areas (mean: 570 m², range: 170–800 m²) and age (4–10 years old). Four gardens are located near other green spaces: Ramenas Voit Vert is located next to a children’s playground with vegetation, Gobétue is located within a historical peach orchard, Perlimpinpin is in a public garden, and Deux Lauriers is in an old abandoned railway. Three gardens include organizers (one person employed in Le jardin sur le toit, two in Herold and Gobétue). In three gardens,

individual plots are cultivated in addition to collective plots. Finally, most gardens (seven out of 10) have an ephemeral status. After the fieldwork was conducted (in 2014–2015), the garden Pouce Vert was closed by the municipality of Pré-Saint-Gervais. In the 10 studied gardens, we carried out ethnographic qualitative work, including participant observations and semistructured interviews (Beaud and Weber 2010). All field studies were conducted by a single researcher, ACT.

Table 1. Features of the studied community gardens

Garden	Location		Opening year	Surface m ²	Related to a green space	Presence of an organizer	Type of plots	Status
	Department	City/Sector						
Pouce vert	Seine Saint-Denis	Près Saint Gervais	2008	800	No	No	Collective	Ephemeral
Ramenas Voit Vert	Seine Saint-Denis	Montreuil	2011	600	Yes	No	Collective	Ephemeral
Gobétue	Seine Saint-Denis	Montreuil	2010	610	Yes	Yes	Collective	Ephemeral
Jardin sur le toit	Paris	20	2009	600	No	Yes	Collective	Ephemeral
Leroy Sème	Paris	20	2005	600	No	No	Collective	Perennial
Héroid	Paris	19	2013	600	Yes	Yes	Collective and individual	Perennial
Perlimpinpin	Paris	17	2008	170	Yes	No	Collective and individual	Ephemeral
Deux Lauriers	Paris	12	2012	500	Yes	No	Collective	Ephemeral
Victor Schultzer	Paris	10	2009	560	No	No	Collective	Perennial
Périchaux	Paris	15	2009	350	No	No	Collective and individual	Ephemeral

Participant observations

From June to December 2014, participant observations were conducted in the gardens to understand ongoing individual and social processes and gardening practices. Each study garden was visited at least 10 times throughout the study, and each visit lasted at least 2 hours. Some visits occurred during social events, such as concerts, picnics, or workshops taking place in the gardens. All observations were recorded by means of field notes and pictures. Pictures were used as mnemonic material, and field notes were analyzed through an inductive method, in order to build an interview guide for further semistructured interviews.

Semistructured interviews

By using semistructured interviews, we provided a flexible and reflective framework, allowing the gardeners to express their conscious and tacit motivations and their experiences in the gardens. This framework provided a comfortable atmosphere to talk and gave gardeners enough time to put their experiences into words throughout the conversation.

From January to September 2015, ACT conducted semistructured interviews with 30 community gardeners and randomly asked a list of predefined questions (Table 2).

Table 2. Questions used during the interviews and their relationship to the three study questions

Study questions	Questions used during the interview
What motivates volunteering gardeners of French community gardens to undertake this activity?	How did you start this activity? Why did you start this activity?
What practices take place in the gardens?	What type of garden is this? What are the schedules of the garden? What types of plots are present in the garden? How is the organization in the garden? Are you supported by the municipality? What types of agricultural practices do you perform in the garden? Do you use pesticides? What do you do with weeds? What plants are cultivated in the garden? Which varieties? Do you grow edible plants? What seeds do you use? What do you do with the produce?
What individual and collective processes are associated with gardeners' experiences in the gardens?	How do you see the future of the garden? What is your opinion about this initiative? Do you want to transmit a message through this activity? What advantages and constraints do you note in relation to the garden and the gardening practices? What are your relationships with other members of the garden? Do you organize meetings with the other members of the association outside the garden? What type of relationship do you have with people living in the neighborhood who are not members of the association? Do you believe that you have developed friendly bonds with other members of the garden? Are you member of other associations? Do you look at insects in the garden? Which ones? Do you like insects? Which ones?

The interviews were individual and took place in the gardens. They were recorded, transcribed, and anonymized; notes were also taken during the interviews. Saturation (Strauss 1987) was reached after 30 interviews, when we could gain no additional information. All interviewed gardeners were regular users of the garden, i.e., they were present and practicing in the garden at least once a week. Interviews were aimed at understanding the first motiva-

tions of gardeners for participating in the garden and to confirm, through gardeners' narratives, the gardening practices and processes recorded during the participant observations. The interviews were run on a voluntary basis and lasted on average 1½ hours (range: 40 min–3 h 30 min). From one to five gardeners were interviewed per garden, depending on the willingness of participants.

Interviewed community gardeners

Individual characteristics of the 30 people interviewed are summarized in Table 3.

Table 3. Interviewed community gardeners

Respondent number	Sex	Age	Current occupation
1	Male	40–60	Unskilled work and precarious jobs (i.e., part-time employment or temporary work))
2	Female	40–60	Association with environmental and social objectives (i.e., environmental education, sustainable development, social or environmental organizer)
3	Male	40–60	Unskilled work and precarious jobs
4	Female	20–40	Student
5	Female	over 60	Unemployed
6	Female	over 60	Unemployed
7	Male	40–60	Unemployed
8	Male	over 60	Retired
9	Male	over 60	Retired
10	Female	40–60	Association with social purposes (back-to-work organizations)
11	Female	40–60	Creative works (i.e., working in art or design)
12	Male	40–60	Job related to trade (i.e., business, administration and commerce)
13	Male	40–60	Creative work
14	Female	40–60	Job related to trade
15	Male	40–60	Association with environmental and social objectives
16	Female	40–60	Unemployed
17	Male	40–60	Unemployed
18	Female	20–40	Unemployed
19	Female	40–60	Association with social purposes
20	Female	40–60	Unemployed
21	Male	20–40	Job related to trade
22	Male	40–60	Association with environmental and social objectives
23	Male	20–40	Association with environmental and social objectives
24	Male	over 60	Technical job (i.e., computer systems or engineer)
25	Female	over 60	Retired
26	Male	over 60	Retired
27	Male	over 60	Retired
28	Female	20–40	Job related to trade
29	Male	20–40	Technical work
30	Male	20–40	Association with environmental and social objectives

Qualitative data analysis

Following the principles of structural and elaborative coding (Saldaña 2009), we coded the notes taken during participant observations. Through several cycles of coding, we filtered, focused, and highlighted the salient features in our data. We then used this coding to analyze the interviews with the gardeners and classified gardeners' motivations for starting to volunteer, their gardening practices, and individual and collective processes associated with this practice. This combined method linking participant observation and openended interviews has been already used in similar studies (e.g., Barthel et al. 2010, Krasny et al. 2012, Bendt et al. 2013). Combining information on what people do and say, recognize gardeners' motivations and processes emerging in gardens.

The coding was carried out by author ACT, who conducted the interviews and participant observations. However, results were thoroughly discussed throughout the process by all three authors to reach consensus and ensure reliable assessment validity.

Features that emerged during the analyses were put in dialog with the theoretical propositions coming from environmental stewardship framework and conservation sciences.

RESULTS

Gardeners' motivations for participating in French community gardens

Environmental motivations

Fourteen out of the 30 interviewed gardeners declared that their first motivation for getting involved in the garden was environmental. We grouped in this category all the declared motivations that encompassed the will to make an ecological contribution to the environment and the feeling of responsibility toward the environment. We also included here all the expressions of willingness to increase individual or collective experiences of nature or being out-

doors, including learning and educating about nature and human–nature interactions, as follows:

The desire to contribute to biodiversity conservation by improving urban biodiversity and raising people’s awareness about human–nature relationships:

I want to raise public awareness about the importance of bees, butterflies, and other pollinating insects who, by their endless activity to survive, also allow human beings to eat, tomatoes and the like. I want to contribute to biodiversity by growing plants that are visited by a certain biodiversity, and in this way, bring bees and other pollinating insects into cities (Respondent 15).

The desire to increase individual contact and experience of nature:

Although I’ve always lived in a city, I’ve always had a need for nature, and I take every opportunity to get away from Paris. Since I can’t get away all the time, I need to bring nature into Paris. I started with having plants at home, having plants on the balcony, and lately, I discovered the community gardens (Respondent 19).

The desire to have an outdoor activity, without specific emphasis on nature:

In my country I was always outdoors, I come from rural area...I joined the community garden because it is a pleasure for me, a hobby, what we want is to relax... (Respondent 8).

The desire to transmit a nature experience to their children:

I used to live in a house with a garden, so I’ve had the chance to interact with nature, see animals, plants growing... I want my kids to have the same experience, I don’t

want them to believe that fish are square, that cows are purple, or that tomatoes grow in supermarkets (Respondent 28).

Self-motivations

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, as follows:

Break in employment: gardening started after having stopped working because of retirement or dismissal:

When I retired, I didn't have anything to do, I had so much time, it was difficult... With the garden, I started meeting people; I spend my time growing plants, enjoying nature... (Respondent 25).

I had an intellectual job... computing... somehow I lost control of my life. I lost my work and it made me... let's say lose my benchmarks. I questioned many things. And the act of returning to nature allows me to rethink my values (Respondent 7).

Break in routine; one gardener referred to an accident that broke his routine:

I had an accident at my work and I broke my shoulder, I'm on sick leave for several months...I live nearby, so I come to see the plants... for me it is a pleasure... I love nature, when I don't feel well, I spend some time here and everything goes better (Respondent 1).

Another gardener started this activity to break from his everyday routine:

I have a daily routine of commuting from work to home... when I come here, I can talk to people from different backgrounds: elderly or young people, couples... a huge va-

riety of people to whom I would never speak otherwise... Here in the garden, we can forget the passing of time...here it's quiet, there are birds, smells of nature... (Respondent 3).

Personal and psychological restoration; gardening was perceived as providing happy breaks in nature, in a specific moment of their lives, when people were going through existential questioning or crisis:

It was a personal process. Without going into too much detail... the so-called 40-year-old crisis; it was a kind of personal questioning, a growing awareness about the aim of life... about existential questions... So, I was drawn to go back to basic things of life, like nature but also social relationships based on sharing... things like that (Respondent 13).

Other gardeners declared that they entered the garden through the reliving of positive past experiences:

When I was a kid, I used to do gardening quite often with my grandmother and I loved that. I've had difficult times in my life and I started to come in this garden because gardening makes me feel good; I remember happy and peaceful moments (Respondent 30).

Social motivations

Finally, six out of 30 interviewed gardeners said that they began participating in the garden for social reasons, as follows:

A desire to build social bonds:

I wanted to meet people with whom I could share the pleasure and interest in growing. And actually it was the only way to know people from my neighborhood (Respondent 6).

A desire to create new social interactions in the city in general:

I wanted to question the way we live in the city, particularly in public spaces, and how we can appropriate the city through nature, use it to express ourselves, meet people, and thus challenge society on how to think about society and our relationship to nature (Respondent 23).

Gardening practices

Gardeners do not use any chemicals, they use ecological and organic processes or treatments to avoid pests: they mix crops, they use natural enemies (e.g., ladybirds), they prepare natural insecticides (e.g., slurry of nettles), or they trap slugs in beer traps. These were learned from external sources (books, internet, gardening courses), but also by imitating other gardeners' practices, or by an explicit transmission of knowledge from a gardener or an organizer to another gardener. Also, Le Pouce Vert has developed a program for composting and recycling Christmas trees that involves inhabitants from the neighborhood. In gardens with collective plots, the decisions concerning land uses and practices are taken collectively. Negotiations are needed to quell emerging conflicts. These conflicts are less common in gardens with organizers, because the organizer chooses and allocates land uses him/herself.

In every single garden, flowering plants are grown to attract insect pollinators. In all gardens but Victor Schoelcher, the gardeners install human-built structures to attract and host insects (insect hotels) and birds (nest boxes). In all gardens but Perichaux, gardeners preferentially

grow traditional varieties of plants instead of varieties from the official French national catalog. They buy seeds from specific associations such as Kokopelli (Kokopelli 2016), exchange seeds with other community gardens or associations, such as Incredible Edibles (Incroyables comestibles Paris 2016). Nevertheless, due to difficulties in buying seeds from associations (e.g., purchasing by internet, do not always have stock for all varieties), the gardeners also buy seeds in garden centers like Truffaut (Truffaut 2016). They also harvest their own seeds in the garden. In Herold garden, gardeners grow crops originating from the home country of one of the gardeners. Two gardens (Leroy Sème and Le Pouce Vert) have ponds, and five gardens include specific unmanaged areas devoted to spontaneously growing vegetation (i.e., wild plants). In French culture, wild plants growing spontaneously in gardens are often perceived negatively and are termed weeds (Menozzi 2007). Yet, most interviewed gardeners referred to wild plants not as “bad” but as opportunistic plants, and they also used the term “adventitious” to qualify them. In individual plots, the control of these plants is based on individual willingness: some gardeners dig them out and compost them; others leave leguminous plants to nourish the soil, to observe their flowers, or to discover potential new uses (for food, drink, fertilizer, etc.). In collective plots, weeds are more or less controlled and removed depending on the garden (removed weeds are always composted): in Herold, based on the organizers’ advice, leguminous plants are kept as a cover crop that helps fix nitrogen in the soil; some weeds are left because they can be used as food (e.g., *Taraxacum officinalis*) or medication (e.g., *Borago officinalis*). In Perichaux collective plots, weeds are removed only in the trails. In Jardin sur le toit and Gobétue, they are mechanically removed only in areas where crops are grown. The same treatment is applied in Le Pouce Vert and Deux Lauriers, where gardeners make sure they keep wild plant species because they believe they offer habitat for animals. Finally, in Leroy Sème, Ramenas voit vert, and Perlimpinpin, weeds are systematically removed.

Furthermore, activities such as picnics, workshops, concerts, or balls are developed in all gardens except for Victor Schoelcher garden. These activities are led by the organizers if the garden has one. Elsewhere, they are organized by the gardeners themselves or anyone willing to become involved in the organization of such events.

Processes taking place in the gardens

Individual motivations for participating in the gardens and ongoing activities in the garden allow diverse types of individual and social processes to emerge, as follows:

Nature contemplation and sensory experiences

The first thing I did was to observe... Before, I thought plants could grow spontaneously... Then I started to compost fruits and vegetables peelings, to plough, and I love it. I put my hands into the soil, it's relaxing, it makes me feel good. Pay attention, check whether I have to trim or remove something, look at earthworms, I love it (Respondent 5).

We have so many ideas about nature, but it is different to concretely implement them in the field, to observe the impact on the soil or on plants. Here, luckily, we can make experiments in the garden without pressure, it makes you forget your problems, it makes you feel good... when I'm here, I don't feel time passing (Respondent 14).

Environmental education

Why does the acanthus grow close to the artichoke? Because they grew up there, by chance. The acanthus settled almost without any help, and then we learned that both plants interact with each other, that ladybirds deposit larvae in the acanthus, and then move to the artichoke to eat aphids (Respondent 9).

...Here luckily, we have X, who is fascinated by insects and who is fascinating when speaking about them, very pedagogical. He transmits to us all his respect and admiration toward insects. I read a lot about animals, but it's not the same when listening to someone, meeting someone showing them to us, teaching us about them (Respondent 6).

I remember, there was a Moroccan guy who used to pass by very often and who eventually entered in the garden once with his son. This man knew a lot about gardening, and he started teaching us. His son was very proud of his father teaching us. I didn't know much, and this man was teaching us how to grow beans (Respondent 10).

Individual and collective organization

Some gardeners planned personal and collective small business activities in relation to gardening, outside the garden, and some gardeners developed personal and collective projects in the garden, such as:

We will become a counselling society; in fact, in some places we already give advice to other gardens. On Thursday, we went to another garden to give them help with our tools (Respondent 8).

We organize workshops to permit children to interact with nature. They come to discover... Once there were lots of spiders in the garden, some children were frightened, but gradually we helped them to overcome their fear and we allowed them to discover the role of animals in the garden... (Respondent 19).

Renew social–ecological relationships

Gardening has a broader meaning for me, it is not only growing plants, it's everything that involves relationships among human beings, and relationships with animals, the relationships with the biotope (Respondent 30).

In the garden, there exists a social diversity, however, despite the differences, with time, we have developed common values, we became conscious of the environment (Respondent 22).

Facing local challenges

Participatory gardening helped solve some local issues, such as soil pollution:

There was suspicion of pollution with heavy metals in the soil... So, they told us, precautionary principle: you must not eat what you grow here, notably because there will be children, pupils, etc. visiting the garden. So, even if it is really frustrating, we found the solution... off-ground cultivation in bins or on straw, with healthy soil (Respondent 14).

We don't know if the land is good... But with time we can recognize a soil with a good quality, or sandy, or polluted... So we became skilled at assessing the soil. And on the contrary, we say: maybe here we should grow things... maybe the soil will recover with time, maybe we will demonstrate that this land was not that bad; and that we can also make a garden even if we can't eat what we grow (Respondent 30).

Facing the risk of garden's closure

The garden will disappear; they will build something here instead... we have fought to keep the garden, we have demonstrated that gardens play a role in offering children animations and activities such as drawing, painting, gardening, or nature observation... There is also the Agenda 21 almost nowhere applied... but nevertheless in the critical climatic context, it is very important to do something, as we have done. Within 6 years, we have created a biotope, it is really important, we have a lot of diversity. We also play a role in the reduction of waste in the city; we have made people change their habits, and they compost organic wastes... (Respondent 5).

DISCUSSION

Gardeners' first motivations for participating in French community gardens

Through qualitative research, we explored the first motivations of regular users of FCG for volunteering in these activities. Our study supports previous studies of environmental stewardship volunteer motivations, designed by the authors as following: helping the environment (Ryan et al. 2001), environmental purposes (Asah and Blahna 2012) or caring for the environment (Bramston et al. 2011); learning (Ryan et al. 2001); social motivations (Ryan et al. 2001), social interactions (Asah and Blahna 2012), or social belonging (Bramston et al. 2011), reflection (Bruyere and Rappe 2007) or defending and enhancing the ego (Ryan et al. 2001, Asah and Blahna 2012). However, despite their apparent diversity, these motivations for starting to garden are all interrelated and enter in our classification in environmental, self, and social motivations. Based on our results, we propose enlarging these three categories of motivations, as follows:

Environmental motivations: this category includes the motivations “helping or caring for the environment” or “environmental purposes motivations,” which refer mostly to restoration of

natural areas. However, our results showed that gardeners refer to a much wider diversity of actions to enhance the environment, including: raise people's awareness about human–nature relationships, learn and educate about nature and human–nature interactions, and promote adults' and children's experiences of nature or “outdoors.” Thus, we propose including in this category the learning motivations (e.g., Ryan et al. 2001) and the “being outdoors” motivation proposed by Bruyere and Rappe (2007). This is particularly important, as the reduction of nature experiences is caused not only by a lack of nature in urban areas, but also by lifestyle factors (Pergams and Zaradic 2006). Thus, greater experiences of nature could be gained by promoting interactions of people (including children) with nature across a range of urban habitats (Crumley 2000, Barthel et al. 2010, Hand et al. 2017). We also included the wish to make direct contact with nature, which is part of the experiences referred to above; it has been proposed as an important predictor of ecological behaviors (Mayer and Frantz 2004; Soga and Gaston 2016).

Self-motivations: this category includes the “reflection” motivation (Ryan et al. 2001), which involves personal or emotional benefits from volunteering, as well as the “escape” motivation (Asah and Blahna 2012) that refers to getting away from the stressful demands of everyday life. In our case, all motivations belonging to this category were driven by stress or shock in gardeners' personal lives. Indeed, all gardeners who mentioned this motivation referred to increased well-being after having started this activity. This result is consistent with the literature, which shows a positive relationship between regular contacts with nature and health: psychological well-being or mental distress (Keniger et al. 2013, White et al. 2013; Hartig et al. 2014, Shanahan et al. 2015, McCracken et al. 2016), general health (Kardan et al. 2015) or general mood (Capaldi et al. 2014). However, in addition to these direct benefits, we propose including in this category symbolic meanings, mostly based on recollections and memories. Indeed, some gardeners evoked remembrances about gardening experiences or places they

visited during childhood, together with associated well-being. This could support the proposition of Krasny et al. (2014) about the sense of place as an important driver of environmental volunteering. Nevertheless, here, remembrances used as the first motivation to become involved in the garden are associated with autobiographical memory more than social–ecological memories as proposed by Krasny et al. (2014).

Social motivation: this category includes the social motivations proposed by Bruyere and Rappe (2007) and by Asah and Blahna (2012), especially in terms of meeting people and building social bonds. However, we propose also including in this category the gardeners' wish to build new social interactions that will challenge social and ecological issues, also referred to as “community motivations” (Asah and Blahna 2012).

Our results are, therefore, largely consistent with previous studies on motivations for volunteering in community gardens in other contexts, showing the importance given by people to these aspects, whatever the context. Interestingly, our interviewed gardeners mentioned only some of the motivations already expressed in the literature, and not the whole range previously recorded.

Compared with motivations expressed in other community garden studies (Guitart et al. 2012), motivations recorded in FCG included neither fresh food consumption nor economic issues. This might be because FCG did not appear in a context of food deprivation or economic depression, contrary to other community gardens elsewhere in the world (e.g., Victory gardens in New York). In addition, although some gardeners are unemployed, the French system of unemployment insurance can buffer their economic difficulties. Food issues are sometimes mentioned in the interviews, but as an educational purpose, not as means of survival. Finally, increasing land accessibility, enhancing spiritual practice, project organization, values and esteem, career, or getting exercise, were not mentioned as primary motivations for participat-

ing in the gardens. As people's motivations may change over time (Ryan et al. 2001), further research is needed.

Gardening practices

Due to gardening practices, most FCG present biophysical features that favor biodiversity. Indeed, the diversity of land uses together with the presence of uncultivated areas (small wastelands) and ponds provide diverse habitats for wild species. Flowering plants, insect hotels, and nest boxes provide resources (food and refuge) for wild fauna (Cannon 1999, Gaston et al. 2005a, b); compost systems nourish the soil through nutrient supply and carbon sequestration (Martínez-Blanco et al. 2013) and provide habitat for many species (see Ødegaard and Tømmerås 2000). Also, some gardens are located in urban green areas and can potentially act as ecological corridors, therefore improving connectivity between buffer zones (Palomino and Carrascal 2006, Goddard et al. 2010, Serret et al. 2014). Thus, FCG could be important places to consider for purposes of urban biodiversity conservation. More generally, the environmentally friendly gardening practices implemented in the gardens differ from French normative representations of what a garden should be, i.e., very much controlled and totally devoid of wild plants (e.g., Thomas 1983). Two specific normative and prescriptive visions are challenged in the study gardens. First, in the majority of the study gardens, gardeners let weeds grow, often out of curiosity, to discover their potential impact on other species and their potential human uses. This is in contrast to the systematic weed control generally implemented by farmers and gardeners to increase crop productivity (Fuhlendorf et al. 2009) and may be due to the fact that the main objective of these gardens is not food production. Second, gardeners use traditional seed varieties in contrast to the official recommendation to use those from official catalogs. The official seeds are sterile (they are mostly F1 hybrids) and prevent any local adaptation of the crops to human practices and local environmental conditions

(Demeulenaere 2014). However, the choice not to use official seeds is presented by the gardeners as a protest against the normative agricultural system and a willingness to participate in an alternative to the seed industry. This is, however, difficult to translate into practice because of the current French regulations and difficulties in accessing traditional seeds. Social networks allowing seed purchase and exchanges are nevertheless very well organized and foster social capital (Bodin and Crona 2008). Social events organized in most of our study gardens are also occasions for gardeners to build in a community (Saldivar and Krasny 2004) and increase social capital.

Finally, as Barthel et al. (2010) proposed for allotments, FCG are places where social–ecological memories are important, through education and transmission, but also through conflict solving and negotiation toward collective management.

Processes taking place in the gardens

Our study highlighted how community gardens provide opportunities for individual and collective dynamic processes toward nature.

First, gardeners attach great importance to their sensory interactions with nature through vision, hearing, sense of smell, or touch. This is highly consistent with the literature showing that experiences of nature engage multiple senses, notably smells and tactile sensations that are greater in natural than in human-built contexts (Kaplan and Kaplan 1989). Through these sensory experiences, gardeners consider their activities in the garden (e.g., growing plants, composting, observing plants and animals) as something contemplative and fascinating that makes them forget their worries, feel the time slow down, and feel good and relaxed. These results corroborate research showing the restorative effects of natural experiences, mainly through reducing mental fatigue (Kaplan and Kaplan 1989, Hartig et al. 1991, Kaplan 1995), emotional and physiological stress recovery, stress reduction (Ulrich 1979, Hartig et al. 2003,

2011), and the feeling of being away from everyday routine (Hartig et al. 1991, Kaplan 1995). Other authors highlighted the benefits of exposure to natural environments on individual health and well-being (Maller et al. 2005, Maas 2006, Bowler et al. 2010, Hartig et al. 2014), particularly gardening (Soga et al. 2017).

These sensory experiences are not only self-dedicated, they can also be used in educational processes in the gardens (as noted by Schama 1995, Misztal 2003, Murdoch 2006). More generally, environmental education in the gardens is about far more than environmental conservation (like in main environmental education frameworks, Bengtsson 2016), but refers to human relationships with and within the environment (see Berryman and Sauvé 2016). Because it is place based, this education can integrate learning about local social–ecological dynamics (Tidball and Krasny 2010b), even in cities. As such and besides their specificities, FCG, as other community gardens, are key arenas for environmental education (Ferris et al. 2001, Krasny and Doyle 2002, Doyle and Krasny 2003, Bendt et al. 2013).

Indeed, some gardeners have constructed alone or collectively projects and/or their own business, such as consulting societies that allow unemployed, retired, and job-dissatisfied gardeners to cope with diverse types of individual wishes or needs. Hence, gardens constitute ideal arenas to turn acquired knowledge into a range of activities, such as garden management, communication, public advertisement, or negotiation. These collective dynamics can be strongly encouraged by the presence of key individuals, such as organizers or some gardeners, acting as social and environmental catalysts who provide leadership, trust, vision, and meaning (see Folke et al. 2005). These people play a crucial role in activating the social capital (Krishna 2002), in addition to collective organization.

As mentioned above, it is now widely acknowledged that urban green spaces may play an important role in preserving biodiversity, notably by providing natural habitats (Gaston et al. 2005b, Kadlec et al. 2008, Loram et al. 2008, Kowarik 2011, van Heezik et al. 2012). Our

study goes one step further, and thus supports previous studies by showing that FCG are also very important for maintaining relationships in cities, not only toward nature but also among people (Barthel et al. 2010, Bendt et al. 2013). Gardeners can develop new social relationships with people in the garden, with people living close to the garden, as well as with people from other community gardens or associations, in solidarity networks. As Agustina and Beilin (2012:447) mentioned, “community gardens provide a space to make the unfamiliar familiar.” In our case, through gardening, gardeners renew their relationship to the urban way of life, to natural entities, or to society. This is consistent with the literature, showing that community gardens contribute to improving neighborhood involvement (Armstrong 2000), social cohesion (Shinew et al. 2004, Maas et al. 2009, Francis et al. 2012, de Vries et al. 2013), and social inclusion (based on shared norms and values, positive and friendly relationships, and feelings of belonging) (Hartig et al. 2014).

These renewed relationships can help gardeners face local challenges. The two most common challenges are (1) competition for land use in a densification context (Schmelzkopf 1995) and (2) soil pollution (Armstrong 2000, Wakefield et al. 2007). Gardeners develop a sense of place (Stedman 2002) that makes painful the possibility of a garden’s closure. Interestingly, even if local challenges are considered as negative experiences, they did not prevent any action. Instead, they were considered as opportunities for people to learn about these problems and to face them creatively. Likewise, gardeners are confronted with systemic difficulties or world visions (e.g., concerning seed provisioning, weed control, legal constraints for crops). However, the different dynamic processes going on within the garden allow some gardeners to develop the ability to adaptively deal with these issues. Nevertheless, following Colding and Barthel (2013), these external and administrative constraints could restrict the capacity of citizens to practically engage in urban social–ecological systems.

CONCLUSION

In this study, we showed a diversity of social–ecological dynamics associated with community gardens. All these processes are closely interrelated (Fig. 2) with feedback loops and take place in different dimensions (individuals, groups and nature).

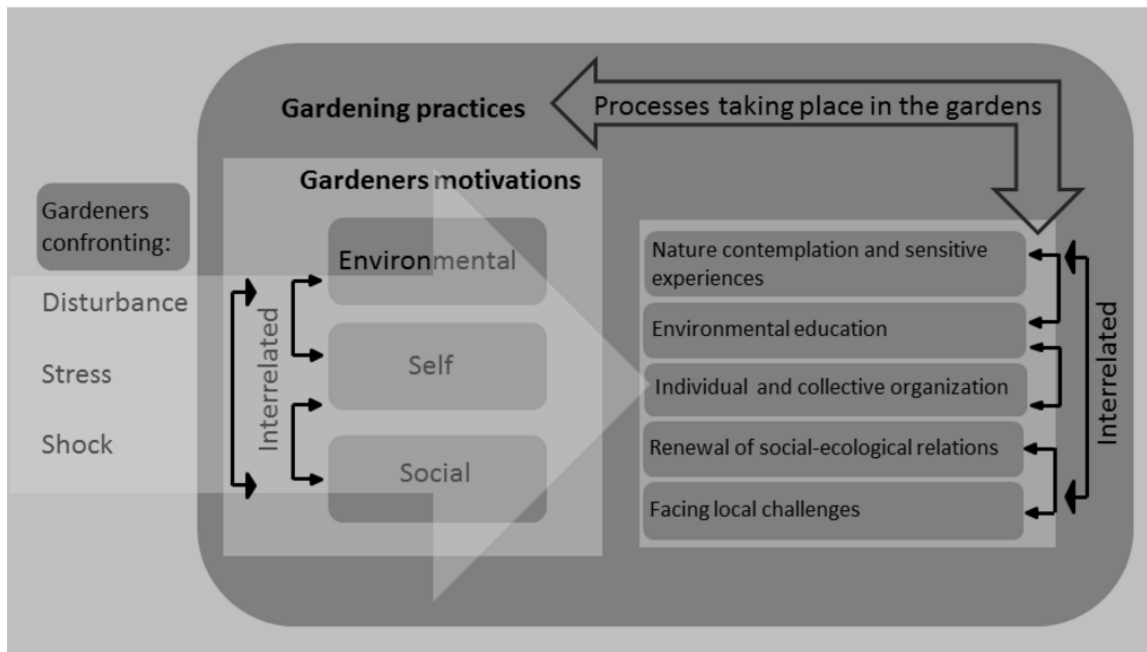


Fig. 2. Schematic representations of social-ecological dynamics in French community gardens

We observe that people volunteer for the same activity for diverse needs and/or motives. The involvement in the gardens affords opportunities to fulfill those needs and/or motives through different interrelated processes between the individual with him/herself, the human collective, and nature. Thus, FCG provide arenas for transforming experiences of nature (Clayton et al. 2017). By allowing transformed experiences of nature, community gardens enhance both urban nature and people's well-being. But FCG can be considered as environmental stewardship practices for other reasons, notably because they provide creative ways to respond to urban challenges. In addition, we could say that apart from cultivating plants, these gardens allow cultivation of new values, i.e., relational values, defined as values not given to things but derivative of relationships and responsibilities to them (Chan et al. 2016). Indeed, the garden is

not important in itself but becomes important because it allows the different dimensions of a social–ecological system to be connected. The values that are encouraged in these places provide opportunities for innovative creative conservation (see Chan et al. 2016), which reflects how caring for ourselves extends to caring for others, place, and nature.

Without claiming that community gardens can cope alone with urban challenges and conservation, we highlighted their relevance at the local level, as places that permit citizens to reconsider social and ecological interdependencies. Further studies are needed to evaluate their social–ecological impacts at a larger scale in space and time.

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LITERATURE CITED

- Agustina, I., and R. Beilin. 2012. Community gardens: space for interactions and adaptations. *Procedia - Social and Behavioral Sciences* 36:439–448.
- Armstrong, D. 2000. A survey of community gardens in upstate New York: implications for health promotion and community development. *Health & Place* 6:319–327.
- Andersson, E., S. Barthel, and K. Ahrné. 2007. Measuring social-ecological dynamics behind the generation of ecosystem services. *Ecological Applications: A Publication of the Ecological Society of America* 17(5):1267–1278.
- Asah, S. T., and D. J. Blahna. 2012. Motivational functionalism and urban conservation stewardship: implications for volunteer involvement. *Conservation Letters* 5(6):470–477.

- Asah, S. T., and D. J. Blahna. 2013. Practical implications of understanding the influence of motivations on commitment to voluntary urban conservation stewardship. *Conservation Biology* 27(4):866–875.
- Barthel, S., C. Folke, and J. Colding. 2010. Social-ecological memory in urban gardens—retaining the capacity for management of ecosystem services. *Global Environmental Change* 20(2010):225–265.
- Baudelet, L., F. Basset, and A. Le Roy. 2008. Jardins partagés: utopie, écologie, conseils pratiques. Terre vivante. France.
- Baudry, S., J. Scapino, and E. Rémy. 2014. L’espace public à l’épreuve des jardins collectifs à New York et Paris. *Géocarrefour* 89(1–2):41–51.
- Beaud, S., and F. Weber. 2010. Guide de l’enquête de terrain. 4e édition. La Découverte, Paris.
- Bendt, P., S. Barthel, J. Colding. 2013. Civic greening and environmental learning in public-access community gardens in Berlin. *Landscape and Urban Planning* 109:18–30.
- Bengtsson, S. L. 2016. Hegemony and the politics of policy making for education for sustainable development: A case study of Vietnam. *The Journal of Environmental Education* 47(2):77–90.
- Berkes, F., and C. Folke. 1998. Linking social and ecological systems: management practices and social mechanisms for building resilience. Cambridge University Press. Cambridge, UK.
- Berryman, T., and L. Sauvé. 2016. Ruling relationships in sustainable development and education for sustainable development. *The Journal of Environmental Education* 47(2):104–117.

- Bodin, Ö., and B. I. Crona. 2008. Management of natural resources at the community level: Exploring the role of social capital and leadership in a Rural Fishing Community. *World Development* 36(12):2763–2779.
- Bowler, D. E., Buyung-Ali, L. M., Knight, T. M., Pulin, A.S. 2010. A systematic review of evidence for the added benefits to health of exposure to natural environments. *BMC Public Health* 10:456.
- Bramston, P., G. Pretty, and C. Zammit. 2011. Assessing environmental stewardship motivation. *Environment and Behavior* 43(6):776–788.
- Bruyere, B., and S. Rappe. 2007. Identifying the motivations of environmental volunteers. *Journal of Environmental Planning and Management* 50(4):503–516.
- Cannon, A. 1999. The significance of private gardens for bird conservation. *Bird Conservation International* 9(4):287-297.
- Capaldi, C. A., R. L. Dopko, and J. M. Zelenski. 2014. The relationship between nature connectedness and happiness: a meta-analysis. *Frontiers in Psychology* 5(976):1-15.
- Chan, J., B. DuBois, and K. G. Tidball. 2015. Refuges of local resilience: community gardens in post-Sandy New York City. *Urban Forestry & Urban Greening* 14:625-635.
- Chapin, F. S., S.R. Carpenter, G. P. Kofinas, C. Folke, N. Abel, W. C. Clark, P. Olsson, D. M. Stafford Smith, B. Walker, O. R. Young, F. Berkes, R. Biggs, J. M. Grove, R. L. Naylor, E. Pinkerton, W. Steffen, and F. J. Swanson. 2010. Ecosystem stewardship: sustainability strategies for a rapidly changing planet. *Trends in Ecology & Evolution* 25(4):241–249.
- Chan, K. M. A., P. Balvanera, K. Benessaiah, M. Chapman, S. Díaz, E. Gómez-Baggethun, R. Gould, N. Hannahs, K. Jax, S. Klain, G. W. Luck, B. Martín-López, B. Muraca, B. Norton, K. Ott, U. Pascual, T. Satterfield, M. Tadaki, J. Taggart, and N. Turner. 2016.

- Opinion: Why protect nature? Rethinking values and the environment. *Proceedings of the National Academy of Sciences* 113(6):1462–1465.
- Clayton, S., A. Colléony, P. Conversy, E. Maclouf, L. Martin, A. C. Torres, M. X. Truong, A.C. Prévot. 2017. Transformation of experience: toward a new relationship with nature. *Conservation Letters*.
- Colding, J., and S. Barthel. 2013. The Potential of “Urban Green Commons” in the resilience building of cities. *Ecological Economics* 86:156–166.
- Corrigan, M. P. 2011. Growing what you eat: Developing community gardens in Baltimore, Maryland. *Applied Geography* 31(4):1232–1241.
- Crumley, C. 2000. Chapter 7 From garden to globe: linking the time and space with meaning and memory. In *The Way The Winds Blows. Climate, History and Human Action*. Columbia University Press. New York.
- D’Abundo, M. L., and A. M. Carden. 2008. “Growing wellness”: The possibility of promoting collective wellness through community garden education programs. *Community Development* 39(4):83–94.
- Davies, W. K. D. 2015. Theme cities: solutions for urban problems. Springer. Canada.
- de Vries, S., S. M. E. van Dillen, P. P. Groenewegen, and P. Spreeuwenberg. 2013. Streetscape greenery and health: stress, social cohesion and physical activity as mediators. *Social Science & Medicine* 94:26-33.
- Demeulenaere, E. 2014. A political ontology of seeds: The transformative frictions of a farmers’ movement in Europe. *Focal-Journal of Global and Historical Anthropology* 69:45-61.
- Doyle, R., and M. Krasny. 2003. Participatory rural appraisal as an approach to environmental education in urban community gardens. *Environmental Education Research* 9(1):91–115.

- Drake, L., and L. J. Lawson. 2014. Validating verdancy or vacancy? The relationship of community gardens and vacant lands in the U.S. *Cities* 40:133–142.
- Ferris, J., C. Norman, and J. Sempik. 2001. People, land and sustainability: community gardens and the social dimension of sustainable development. *Social Policy & Administration* 35(5):559–568.
- Folke, C., T. Hahn, P. Olsson, and J. Norberg. 2005. Adaptive governance of social-ecological systems. *Annual Review of Environment and Resources* 30(1):441–473.
- Folke, C., and Gunderson, L. 2012. Reconnecting to the biosphere: a social-ecological renaissance. *Ecology and Society* 17(4):55.
- Folke, C., R. Biggs, A. V. Norström, B. Reyers, and J. Rockström. 2016. Social-ecological resilience and biosphere-based sustainability science. *Ecology and Society* 21(3):41.
- Francis, J., B. Giles-Corti, L. Wood, and M. Knuiman. 2012. Creating sense of community: the role of public space. *Journal of Environmental Psychology* 32(4):401–409.
- Fuhlendorf, S., D. M. Engle, C. M. O’Meilia, J. R. Weir, and D. C. Cummings. 2009. Does herbicide weed control increase livestock production on non-equilibrium rangeland? *Agriculture, Ecosystems & Environment* 132:1–6.
- Gaston, K. J., R. M. Smith, K. Thompson, and P. H. Warren. 2005a. Urban domestic gardens (II): experimental tests of methods for increasing biodiversity. *Biodiversity and Conservation* 14(2):395–413.
- Gaston, K. J., P. H. Warren, K. Thompson, and R. M. Smith. 2005b. Urban domestic gardens (IV): the extent of the resource and its associated features. *Biodiversity and Conservation* 14:3327–3349.
- Goddard, M., A. J. Dougill, and T. G. Benton. 2010. Scaling up from gardens: biodiversity conservation in urban environments. *Trends in Ecology and Evolution* 25(2):90–98.

- Graine de Jardins. 2016. Carte des jardins. [online] URL: <http://www.jardinons-ensemble.org/spip.php?rubrique1#2016-06-01>.
- Guitart, D., C. Pickering, and J. Byrne. 2012. Past results and future directions in urban community gardens research. *Urban Forestry & Urban Greening* 11(4):364–373.
- Hand, K. L., C. Freeman, P. J. Seddon, M. R. Recio, A. Stein, and Y. van Heezik. 2017. The importance of urban gardens in supporting children's biophilia. *Proceedings of the National Academy of Sciences* 114(2):274–279.
- Hartig, T., M. Mang, and G. Evans. 1991. Restorative effects of natural environment experiences. *Environment and behavior* 23(1):3-26.
- Hartig, T., G. W. Evans, L. D. Jamner, D. S. Davis, and T. Gärling. 2003. Tracking restoration in natural and urban field settings. *Journal of Environmental Psychology* 23(2):109–123.
- Hartig, T., A. E. van den Berg, C. M. Hagerhall, M. Tomalak, N. Bauer, R. Hansmann, A. Ojala, E. Syngollitou, G. Carrus, A. van Herzele, S. Bell, M. T. Camilleri Podesta, and G. Waaseth. 2011. Health benefits of nature experience psychological, social and cultural processes. *Forests, trees and human health*. Springer. Netherlands.
- Hartig, T., R. Mitchell, de Vries, S. and H. Frumkin. 2014. Nature and Health. *Annual Review of Public Health* 35/207-28.
- Harvey, D. 2013. *Rebel Cities. From the Right to the City to the Urban Revolution*. Verso. New York.
- Incroyables comestibles Paris. 2016. Facebook Page. [online] URL: <https://www.facebook.com/Incroyables-Comestibles-Paris-122467857901658/>.

- INSEE. 2013. Population en 2013 : Pré-Saint-Gervais (93061), Paris (75) and Montreuil (93048). [online] URL: <https://www.insee.fr/fr/statistiques/1405599?geo=COM-93061+DEP-75+COM-93048>
- Irvine, S., L. Johnson, and K. Peters. 1999. Community gardens and sustainable land use planning: A case-study of the Alex Wilson community garden. *Local Environment* 4(1):33–46.
- Kadlec, T., J. Benes, V. Jarosik, and M. Konvicka. 2008. Revisiting urban refuges: changes of butterfly and burnet fauna in Prague reserves over three decades. *Landscape and Urban Planning* 85(1):1–11.
- Kaplan, R. 1973. Some psychological benefits of gardening. *Environment and Behavior* 5(2):145-162.
- Kaplan, R. and S. Kaplan. 1989. The experience of nature: a psychological perspective. Cambridge University Press. New York.
- Kaplan, S. 1995. The restorative benefits of nature: toward an integrative framework. *Journal of environmental psychology* 15:169-182.
- Keniger, L. E., K. J. Gaston, K. N. Irvine, and R. A. Fuller. 2013. What are the benefits of interacting with Nature? *International Journal of Environmental Research and Public Health* 10(3):913–935.
- Kardan, O., P. Gozdyra, B. Misic, F. Moola, L. J. Palmer, T. Paus, and M. G. Berman. 2015. Neighborhood greenspace and health in a large urban center. *Scientific Reports* 5(11610).
- Kokopelli. 2016. Web Page. [online] URL: <https://kokopelli-semences.fr/?lang=fr-fr>.
- Kowarik, I. 2011. Novel urban ecosystems, biodiversity and conservation. *Environmental Pollution* 159:1974–1983.

- Krasny, M. E., and R. Doyle. 2002. Participatory approaches to program development and engaging youth in research: the case of an inter-generational urban community gardening program. *Journal of Extension* 40(5).
- Krasny, M. E. and Tidball, K. G. 2012. Civic ecology: a pathway for Earth Stewardship in cities. *Frontiers in ecology* 10(5): 267-273.
- Krasny, M. E., S. R. Crestol, K. G. Tidball, and R. C. Stedman. 2014. New York City's oyster gardeners: Memories and meanings as motivations for volunteer environmental stewardship. *Landscape and Urban Planning* 132:16–25.
- Krishna, A. 2002. Active social capital. Training the roots of development and democracy. Columbia University Press. New York.
- Loram, A., P. H. Warren, and K. J. Gaston. 2008. Urban domestic gardens (XIV): The characteristics of gardens in five cities. *Environmental Management* 42(3):361–376.
- Maas, J., R. A. Verheij, P. P. Groenewegen, S. de Vries, P. Spreeuwenberg. 2006. Green space, urbanity, and health: how strong is the relation? *Journal of Epidemiology & Community Health* 60(7):587–592.
- Maas, J., S. M. E. van Dillen, R. A. Verheij, and P. P. Groenewegen. 2009. Social contacts as a possible mechanism behind the relation between green space and health. *Health & Place* 15(2):586-595.
- Maller, C., A. Pryor, P. Brown. 2005. Healthy nature healthy people: “contact with nature” as an upstream health promotion intervention for populations. *Health Promotion International* 21(1):45–54.
- Mairie de Paris. 2012a. Convention cadre d'occupation et d'usage pour la gestion d'un jardin collectif. [online] URL : <https://api-site.paris.fr/images/123237.pdf>.
- Mairie de Paris. 2012b. La Charte Main Verte des jardins partagés de Paris. [online] URL: <http://api-site-cdn.paris.fr/images/123236.pdf>.

- Martínez-Blanco, J., C. Lascano, T. H. Christensen, P. Muñoz, J. Rieradevall, J. Moller, A. Antón, and A. Boldrin. 2013. Compost benefits for agriculture evaluated by life cycle assessment. A review. *Agronomy for Sustainable Development* 33(4):721-732.
- Matteson, K. C., J. S. Ascher, and G. A. Langellotto. 2008. Bee richness and abundance in New York City urban gardens. *Annals of the Entomological Society of America* 101(1):140–150.
- Matteson, K. C., and G. A. Langellotto. 2011. Small scale additions of native plants fail to increase beneficial insect richness in urban gardens: Native plant additions in urban gardens. *Insect Conservation and Diversity* 4(2):89–98.
- Mayer, F. S., and C. M. Frantz. 2004. The connectedness to nature scale: A measure of individuals' feeling in community with nature. *Journal of Environmental Psychology* 24(4):503–515.
- McCracken, D. S., D. A. Allen, and A. J. Gow. 2016. Associations between urban green-space and health-related quality of life in children. *Preventive Medicine Reports* 3:211–221.
- Meier, L., and H. Lange. 2009. The new middle classes. Dordrecht: Springer Netherlands. [online] URL: <http://link.springer.com/10.1007/978-1-4020-9938-0>.
- Menzio, M.-J. 2007. Mauvaises herbes, qualité de l'eau et entretien des espaces. *Natures Sciences Sociétés* 15:144-153.
- Misztal, B. A. 2003. Theories of social remembering. Open University Press. Philadelphia.
- Murdoch, J. 2006. Post-structuralist geography: A guide to relational space. Sage Publications. London.
- Ødegaard F., and B. A. Tømmerås. 2000. Compost heaps – refuges and stepping-stones for alien arthropod species in northern Europe. *Diversity Distribution* 6:45-49.

- Palomino, D. and L. M. Carrascal. 2006. Urban influence on birds at a regional scale: a case study with the avifauna of northern Madrid province. *Landscape and Urban Planning* 77:276-290.
- Pergams, O. R. W., and P. A. Zaradic. 2006. Is love of nature in the US becoming love of electronic media? 16-year downtrend in national park visits explained by watching movies, playing video games, internet use, and oil prices. *Journal of Environmental Management* 80(4):387–393.
- Pyle, R. M. 1978. The Extinction of Experience. *Horticulture* 56:64–67.
- Pyle, R. M. 2003. Nature Matrix: Reconnecting People and Nature. *Oryx* 37(2):206–214.
- Ryan, R. L., R. Kaplan, and R. E. Grese. 2001. Predicting volunteer commitment in environmental stewardship programmes. *Journal of Environmental Planning and Management* 44(5):629–648.
- Richards, D. R., P. Passy, and R. R. Y. Oh. 2017. Impacts of population density and wealth on the quantity and structure of urban green space in tropical Southeast Asia. *Landscape and Urban Planning* 157:553–560.
- Saldaña, J. 2009. The coding manual for qualitative researchers. SAGE Publications. London.
- Saldivar-tanaka, L., and M. E. Krasny. 2004. Culturing community development, neighborhood open space, and civic agriculture: The case of Latino community gardens in New York City. *Agriculture And Human Values* 21(4):399–412.
- Schama, S. 1995. Landscape and memory. Vintage Books. New York.
- Schmelzkopf, K. 1995. Urban community gardens as contested space. *America Geographical Society* 85(3):364–381.
- Serret, H., R. Raymond, J-C. Foltête, P. Clergeau, L. Simon, and N. Machon. 2014. Potential contributions of green spaces at business sites to the ecological network in an urban

- agglomeration: the case of Ile-de-France region, France. *Landscape and Urban Planning* 131:27-35.
- Shanahan, D. F., R. A. Fuller, R. Bush, B. B. Lin, and K. J. Gaston. 2015. The health benefits of urban nature: How much do we need? *BioScience* 65(5):476–485.
- Shinew, K. J., T. D. Glover, and D. C. Parry. 2004. Leisure spaces as potential sites for inter-racial interaction: Community gardens in urban areas. *Journal of Leisure Research* 36(3):336–355.
- Soga, M., and K. Gaston. 2016. Extinction of experience: the loss of human-nature interactions. *Frontiers in Ecology and the Environment* 14(2): 94–101.
- Soga, M., K. J. Gaston, and Y. Yamaura. 2017. Gardening is beneficial for health: A meta-analysis. *Preventive Medicine Reports* 5:92–99.
- Somerset, S. M., R. Ball, M. Flett, and R. Geissman. 2005. School-based community gardens: re-establishing healthy relationships with food. *Journal of the HEIA* 12(2).
- Stedman, R. C. 2002. Toward a social psychology of place. Predicting behavior from place-based cognitions, attitude, and identity. *Environment and Behavior* 34(5):561–581.
- Stocker, L., and K. Barnett. 1998. The significance and praxis of community-based sustainability projects: Community gardens in western Australia. *Local Environment* 3(2):179–189.
- Strauss, A. L. 1987. *Qualitative analysis for social scientists*. Cambridge University Press. Cambridge.
- Tidball, K., and M. Krasny. 2010a. Stewardship, learning, and memory in disaster resilience. *Environmental Education Research* 16:591-609.
- Tidball, K. G., and M. E. Krasny. 2010b. Urban environmental education from a social-ecological perspective: conceptual framework for civic ecology education. *Cities and the Environment* 3(1).

- Thomas, K. 1983. Man and the natural world changing attitudes in England 1500-1800. Penguin edition. England.
- Tratalos, J., R. A. Fuller, P. H. Warren, R. G. Davies, and K. J. Gaston. 2007. Urban form, biodiversity potential and ecosystem services. *Landscape and Urban Planning* 83(4):308–317.
- Truffaut. 2016. Webpage. [online] URL: <http://www.truffaut.com/jardin/plantes-potager/graines-legumes/Pages/produits-graines-legumes.aspx>.
- Ulrich, R. S. (1979) Visual landscapes and psychological well-being. *Landscape research* 4(1):17-23.
- van Heezik, Y. M., K. J. M. Dickinson and C. Freeman. 2012. Closing the gap: communicating to change gardening practices in Support of native biodiversity in urban private gardens. *Ecology and Society* 17(1):34.
- Wakefield, S., F. Yeudall, C. Taron, J. Reynolds, and A. Skinner. 2007. Growing urban health: Community gardening in south-east toronto. *Health Promotion International* 22(2):92–10.
- White, M. P., I. Alcock, B. W. Wheeler, and M. H. Depledge. 2013. Would you be happier living in a greener urban area? A fixed-effects analysis of panel data. *Psychological Science* 24(6):920–928.

Chapitre 3

Habitat heterogeneity in community gardens promotes spontaneous plants richness

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Highlights

- Collective management and diversity of land uses in community gardens produce habitat heterogeneity.
- Habitat heterogeneity promotes spontaneous plants richness.
- Gardening practices and stakeholder decisions positively impact conservation.
- Garden age and not size matters in plant species richness.
- Spontaneous plants in community gardens provide food resources for pollinators.

Abstract

Urban biodiversity conservation emerges as a rising concern as the pace of urbanization accelerates. In urban landscapes, community gardens are public and regulated, and are the object of many social studies because of the range of benefits and outcomes conferred to them. Comparatively very few natural sciences studies have been conducted in these gardens so far. Here, we explore how the features and the management of community gardens affect the taxonomic and functional diversity of spontaneous plants found in these gardens, through the analysis of the effect of gardens' size, the effect of age since the settlement, and the effect of habitat heterogeneity conditions in a densely-populated city (Paris-France).

Our study reveals that community gardens shelter a rich community of spontaneous plants, among which 23 % are pollinated only by insects, suggesting that they could be an important source of food for pollinators. We found mostly plants that flower and fruit several times in their lifetime, and that present mostly generalist preferences for environmental characteristics. However, some species present specializations such as a high affinity to light, to atmospheric humidity, temperature or high nitrogen.

Habitat heterogeneity has an effect on specific plant richness. The age since the settlement had only a slightly significant effect on specific plant richness. No effect of the surface of the garden could be detected.

Our study gives insights about the importance of community gardens for the settlement of spontaneous flora, and the role of gardeners' management to maintain it through habitat heterogeneity.

Keywords: city; conservation; specific diversity; functional diversity; urban planning, spontaneous plants.

Introduction

Urban nature is increasingly becoming an environmental and political issue (Adams, 2005; Miller & Hobbs, 2002; Schwartz, Turbé, Simon, & Julliard, 2014), and biodiversity conservation has progressively become a major priority in cities (Jarošík, Konvička, Pyšek, Kadlec, & Beneš, 2011). Even if cities represent only 3 % of the Earth surface, they are considered as having negative impacts on biodiversity, including local extinctions (Marzluff, Bowman, & Donnelly, 2001) and biotic homogenization (McKinney, 2006). However, cities provide habitats for biodiversity, such as urban parks and gardens (Goddard, Dougill, & Benton, 2010; Kendal, Williams, & Williams, 2010; Schwartz, Muratet, Simon, & Julliard, 2013; Torres et al., 2017), vegetated roofs and walls (Madre, Clergeau, Machon, & Vergnes, 2015; Madre, Vergnes, Machon, & Clergeau, 2014), or railway edges (Penone, Machon, Julliard, & Le Viol, 2012). Research on gardens has focused largely on private gardens, considering their role in maintaining urban biodiversity by providing habitats and resources (Gaston et al., 2007), particularly for birds and insects (A. Cannon, 1999; A. R. Cannon, Chamberlain, Toms, Hatchwell, & Gaston, 2005; Fetridge, Ascher, & Langellotto, 2008; French, Major, & Hely,

2005; Muratet & Fontaine, 2015; Richard M. Smith, Gaston, Warren, & Thompson, 2006; Richard M. Smith, Warren, Thompson, & Gaston, 2006). Private gardens can also play a role in landscape connectivity for plants and animals (Sperling & Lortie, 2010; Vergnes, Kerbiriou, & Clergeau, 2013; Vergnes, Viol, & Clergeau, 2012). Plant species richness in private gardens is impacted by the characteristics of the gardens, the owners' personal data (e.g. owners age, see: González-Ball, Bermúdez-Rojas, & Romero-Vargas, 2017), and the planting and management (Loram, Thompson, Warren, & Gaston, 2008; Smith, Thompson, Hodgson, Warren, & Gaston, 2006).

The management of private gardens (e.g. the use of chemicals) depends on the gardener own decisions (Mathieu, Freeman, & Aryal, 2007; Muratet & Fontaine, 2015). On the contrary, in public green spaces (e.g. public gardens and parks) management practices are regulated by public local authorities. One example is the differential management program adopted by several European cities (e.g. Amsterdam, Hamburg, Brussels, Paris) to develop sustainable green spaces. One of the objectives of this program is to increase biodiversity (Aggéri, 2010) through a range of practices such as: zero pesticides, reuse of organic waste and creation of several semi-natural sub-habitats (Shwartz et al., 2013).

In general, urban green spaces play a critical role in supporting biodiversity (Jarošík et al., 2011) and ecosystem services (Andersson et al., 2014; Elmqvist et al., 2015; Goddard et al., 2010), they also provide urban people with the first opportunities to contact and experience nature (Clayton et al., 2017; Soga & Gaston, 2016), they may influence people health (Soga, Gaston, & Yamaura, 2017) and well-being (Chiesura, 2004; Muratet, Pellegrini, Dufour, Arrif, & Chiron, 2015). In addition, public spaces provide social benefits by promoting community integration (Barbosa et al., 2007).

Community gardens (CG) are a category of urban green spaces that have drawn research attention because of the range of benefits and outcomes conferred to them (Drake & Lawson,

2014), which include: health benefits (Armstrong, 2000), mainly by the reduction of mental fatigue (Kaplan, 1973); food provision, through an increase in vegetable consumption (Blair, Giesecke, & Sherman, 1991) and contribution to individual, household and community food security (Corrigan, 2011); educational outcomes in nutritional education (D'Abundo & Carden, 2008; Somerset, Ball, Flett, & Geissman, 2005) and environmental education and learning (Bendt, Barthel, & Colding, 2013; Doyle & Krasny, 2003; Ferris, Norman, & Sempik, 2001; M. Krasny & Doyle, 2002) that are also opportunities to combat generational amnesia (Bendt et al., 2013); involvement toward nature and conservation (Krasny & Tidball, 2012), by providing arenas to gain new experiences of nature, and to cultivate relational values (Torres, Nadot, & Prévot, 2017); improvement of environmental sustainability (Stocker & Barnett, 1998) and promotion of sustainable land uses and planning (Irvine, Johnson, & Peters, 1999). Community gardens have also been shown to increase local biodiversity (Matteson, Ascher, & Langellotto, 2008; Matteson & Langellotto, 2011), but little is known about how their particular features and their management may affect the ecological functioning of these spaces (Guitart, Pickering, & Byrne, 2012). Moreover, to our knowledge no study has yet investigated the effects of CG features and management on spontaneous vegetation.

Torres et al. (2017) recently highlighted how the representation of spontaneous plants has changed for some Parisian urban gardeners in French community gardens, from a negative view (referring to these plants as weeds) to a more tolerant one (referring to spontaneous plants not as "bad" but as opportunistic or adventitious plants). This change results in a different management of spontaneous plants in the gardens, as gardeners let them grow more often. In this paper, we investigate the consequences of these changing representations and practices on the specific and functional richness of spontaneous plants in community gardens, in a very densely-populated metropolis, Paris (France). Referring to existing knowledge in the ecologi-

cal literature, we analyze the effect of the garden's size (Loram et al., 2008; Smith, Thompson, et al., 2006), age (Bastin & Thomas, 1999) and habitat heterogeneity (Cervelli, Lundholm, & Du, 2013) due to the diversity of land uses created by the gardeners (see Muratet et al., 2008), expecting a positive relationship between each of these three variables and the specific and functional richness. We discuss our results in light of urban planning and gardening practices, with regard to biodiversity conservation.

2. Materials and Methods

2.1 Study area

The research was conducted in Paris (France). With an area of 105.5 km² (Pinçon & Pinçon-Charlot, 2014) and a population of 2 220 445 inhabitants, Paris is considered as one of the densest cities in the world (21 066.8 inhabitants/km²) (INSEE, 2014), with an availability of green areas per person corresponding to 14.5 m² (APUR, 2004).

2.1.1 Sampled community gardens

In Paris, community gardens (CG) are managed collectively by volunteers with the non-profit goal of growing flowers and/or edible plants. They are organized with individual and/or collective plots (Torres et al., 2017). They can be set up informally, occupying a vacant public or private land, but some municipalities (e.g. Paris, Lille) have developed programs to frame their setting up (Baudalet, Basset, & Le Roy, 2008). All officially set up gardens are public; they are managed by an association that has previously signed an official agreement with local authorities or land owners. The agreement specifies the modalities of occupancy and use of the dedicated vacant land, the activities and objectives of the association (e.g., garden management, activities planned, rules for the planting of trees and bushes), the duties of the association (e.g. organize activities for the public, favor ecofriendly practices including no use of

pesticides or herbicides) and the duration of the agreement (generally one year, extendable up to five years). Land owners' duties are also stated in the agreement (e.g., provide gardening equipment, water supply) (Mairie de Paris, 2012b). Besides, those gardens that are settled in municipality lands must sign a charter highlighting the principles of CG (e.g. implement participative frameworks, increase social cohesion and environmental respect) and gardeners' engagements (e.g. public opening, communicate about garden activities) (Mairie de Paris, 2012a). According to Paris municipality, 97 CG have signed the green hand charter and 16 have not signed it (Mairie de Paris, 2016).

In our study, we sampled the spontaneous plant diversity in 10 CG, which differ from each other in the three features of interest in this study (Table 1).

Table 1 Features of the studied gardens

Garden	Opening year	Garden size (m ²)	Number of habitats*
Aux habitants	2002	360	5
Blanc Manteaux	2010	100	4
Deux Lauriers	2012	500	9
Héroid	2013	600	10
Leroy Sème	2005	600	9
Périchaux	2009	350	10
Perlimpinpin	2008	170	6
Poterne des Peupliers	2009	80	9
Ruisseau	2004	420	4
Victor Schoelcher	2009	560	4

*See next paragraph for the description of habitat categories.

All the data were collected in spring (March-June 2015), which is the best period to identify plant species (Muratet et al., 2008).

2.2 Habitat categories

We used the diversity of land uses in the gardens as a proxy for the diversity of habitats. We recorded the following fifteen categories of land uses across all the gardens during the study period (see also Appendix 1). Some gardens include all 15 categories; others present only some of the categories. (1) Edible area, where vegetables and fruits are grown; (2) pedestrian area, where the soil is trampled due to systematic passage of people; (3) grassland, with a regular mowing; (4) permaculture area, with permaculture practices such as garden beds; (5) leisure area, dedicated to picnics and resting; (6) ornamental area where ornamental plants are grown, showing high level of gardening; (7) paths between plots; (8) managed area without plantations; (9) unmanaged area; (10) rocky area, with structures made of rocks; (11) experimental area where experimental crops are tested; (12) aromatic area which aromatic plants; (13) area for off-ground plantations; (14) boundary, either hedge or fence; (15) pond.

The most common types of land uses are the edible, ornamental and aromatic gardens. The fewer land uses, the more conventional gardening practices are. A broader range of land uses relates with ecological sensitive styles of gardening (i.e. experimental crops, permaculture area, crops in bins) (Kiesling & Manning, 2010).

2.3 Specific richness of spontaneous plant

We identified most species in the field using the two following guides: “Sauvage de ma rue” (Machon & Motard, 2012) and “Guide Delachaux des plantes d’Europe” (Streeter, Hardcastle, Hart-Davies, Cole, & Harper, 2011). Plants that remained unidentified in the field were collected and identified in the laboratory with the help of more complete floras: “Flora vegetative: un guide pour determiner les plantes de Suisse à l’état vegetative” (Eggenberg, Möhl, & Purro, 2013) and “Flore de l’Ile-de-France: clés de determination, taxonomie, status” (Jau-

zein & Nawrot, 2013).

2.4 Functional richness of spontaneous plants

The functional richness of spontaneous plants present in the gardens was assessed with regard to two specific traits – life span and pollen vector-, and the plants level of abiotic preferences. Life span refers to the time in which a plant species usually completes its life cycle from germination to death, and pollen vector refers to pollination mode. Life span and pollen vector were extracted from the bioflor database (Klotz, Kühn, & Durka, 2002). Urban abiotic environmental preferences of each species were assessed through the Ellenberg indicator values (EIVs) (Ellenberg, 1988) which provide preferences of plant species along nine environmental gradients (Table 2). The categories for each trait and preferences were either ordinal or nominal. The information of traits was then coded (Table 2). Traits and environmental preferences were recorded only when the information was available.

Table 2 Selected traits and plants preferences

	Data type	Categories
Traits		
Life span	5 ordinal levels	Ranging from annual to perennial
Pollen vector	10 nominal levels	Wind Self Insect
Preferences		
Ellenberg indicator values: (light, temperature, continentality, moisture, atmospheric humidity, soil reaction, nitrogen)	9 ordinal levels	From 1 (intolerant) to 9 (very tolerant)*

* For moisture the level goes up to 12

2.5 Statistical analysis

We assigned one level of species richness (based on 227 species) and one level of functional richness (based on 118 species; FRic (functional richness) which represents the amount of

functional space occupied by the community, computed with FD (functional diversity); (Laliberté & Legendre, 2010; Laliberté, Legendre, & Shipley, 2014) per garden and checked for the normal distribution of these two variables. We then tested the respective effects of the garden's age, size and number of different land uses on both variables independently, by running linear models and checking for the normality of residuals' model. The data were analyzed with R version 2.13.1 (R Core Team, 2013) with Rstudio (RStudio 2016).

3. Results

3.1 Spontaneous plants species richness in community gardens

A total of 227 species were recorded in the studied gardens (species names are given in Appendix 2). Species richness ranged from 21 to 95 species (Figure 1) depending on the garden (mean=62.6 +/- 23.6). It was significantly positively correlated with both the number of land uses in the garden and the age of the garden, but did not correlate with the size of the garden (Table 3). The linear model showed a high level of fitting with the data ($R^2 = 0.79$).

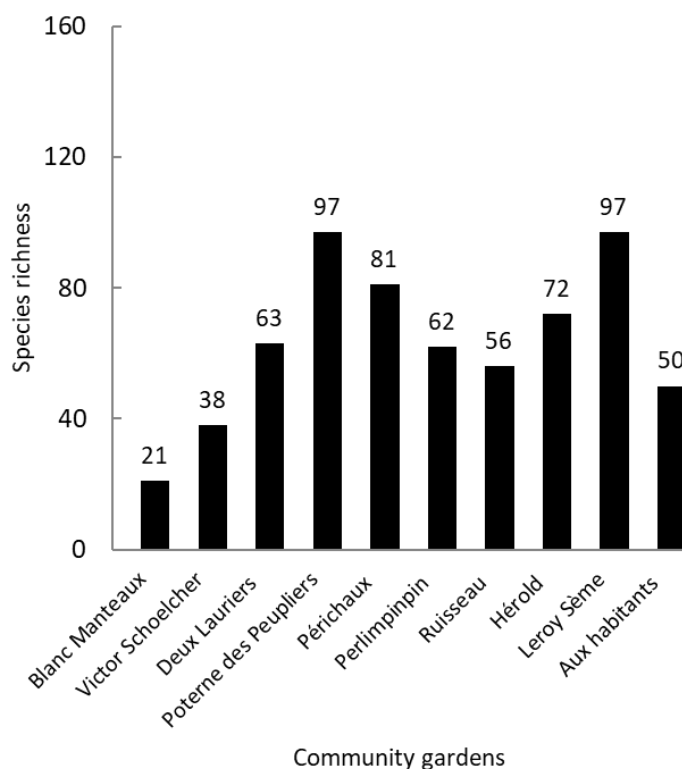


Figure 1. Species richness of spontaneous plants present in the community gardens.

3.2 Functional diversity of spontaneous plants present in community gardens

Among the species for which data were available for the selected traits and abiotic preferences, 23% were exclusively insect pollinated, 34% insects or self-pollinated, 8% were exclusively wind pollinated, 2% wind or self-pollinated, and 3% were self-pollinated. The information was missing for 68 species (30% of the total). 37% were pluriennial, 18% annual, 2% annual and biennial, and biennial and pluriennial respectively, and finally 1% were exclusively biennial; annual and pluriennial; annual, biennial and pluriennial respectively. The information was missing for 88 species (39% of the total).

Concerning plants environmental preferences (Figure 2), most spontaneous plants found in the gardens were tolerant to 5 out of the 9 considered environmental characteristics (EIVs between 4 and 6). 43% of sampled spontaneous plants prefer open environments, 33% prefers alkaline soils and 33% tolerate both alkaline and acid soils, finally 27% prefer soils with high nitrogen content. Almost 35% of the data were lacking for each of the EIVs.

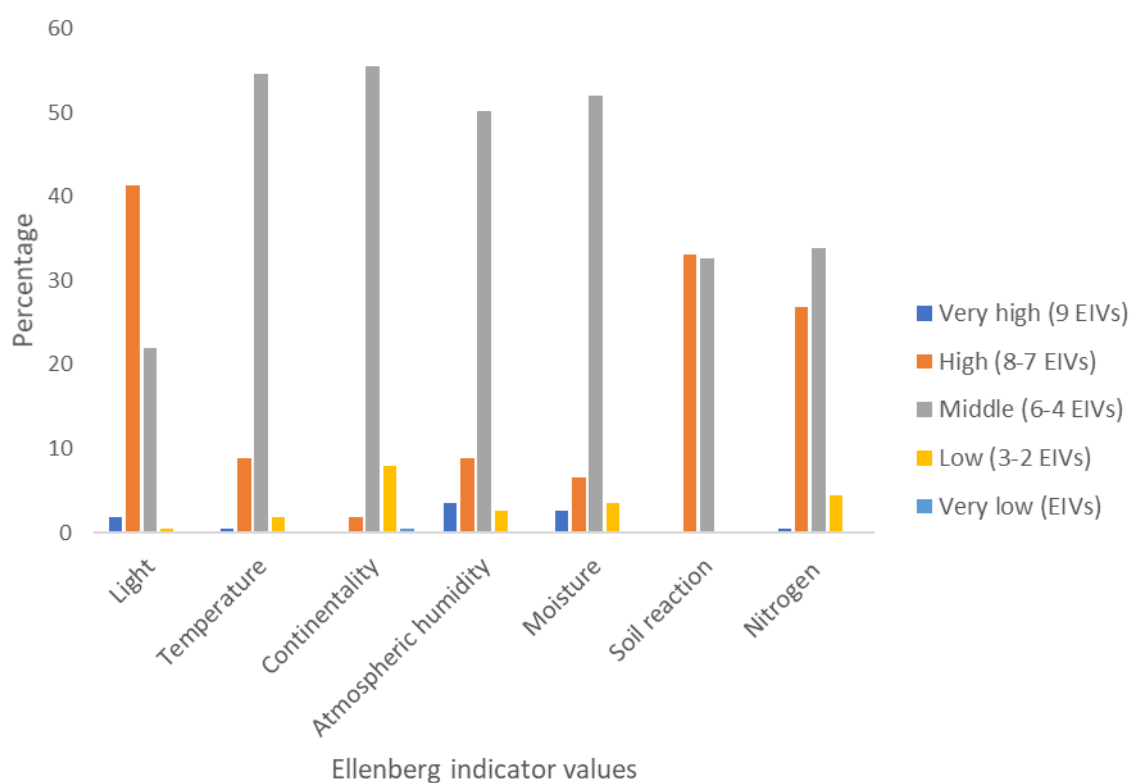


Figure 2. EIVs of the inventoried spontaneous plants.

The functional richness was significantly positively correlated with the number of land uses in the garden (Table 3). No correlation was found with the age or size of the gardens. The linear model showed a high level of fitting with the data ($R^2 = 0.72$).

Table 3. Statistical analyses (linear models) of the effects of garden land uses and garden features on species richness and functional richness of spontaneous plants present in the gardens.

	Species richness		Functional richness	
	Estimate (SE)	p-Value	Estimate (SE)	p-Value
Age	2.78 (1.16)	0.053	-1.01 (0.5)	0.805
Size	-0.01 (0.01)	0.467	-0.003 (0.008)	0.683
Land use diversity	8.97 (1.54)	0.001	2.96 (0.66)	0.004

4. Discussion

Our study shows that urban community gardens can home a high diversity of spontaneous plants in terms of species number, even if they are of small size. Moreover, it suggests that this diversity is variable among gardens, depending on the human practices that are taking place in each garden, which could act as environmental filters (Diamond, 1975) shaping urban plant communities. In the following, we discuss our results in terms of the ecology of urban biodiversity, and propose some directions for urban planning.

4.1. Ecological characteristics of urban spontaneous plants in community gardens

Most of the species identified in the studied community gardens were common species in the Paris region, which is consistent with a previous study conducted in 39 small public gardens (0.5-2.0 ha) in the same city (Shwartz et al., 2013). Common species largely contribute to the structure, biomass, and energy turnover of an ecosystem (Gaston, 2010) and allow people to gain experiences from nature in their everyday lives (Clayton et al., 2017; Soga & Gaston,

2016). Therefore they play a major role in socio-ecological systems. Across our ten study sites, we sampled over 30% of the total number of plant species observed across almost one thousand sites of an urban department in the same region (Muratet et al., 2008). This finding confirms that small areas in a very dense urban matrix can be very important in hosting a high level of urban biodiversity.

Beyond species richness, our results highlighted the functional diversity of these spontaneous species, as shown by the presence of plants with diverse ecological functions. Almost a quarter of the species for which information was available were exclusively insect-pollinated. This is consistent with another study conducted in Paris (N. Machon personal communication, August 2017) in which 35 out of the 117 sampled spontaneous plant species (i.e. 29%) on urban tree feet were insect-pollinated.

The presence in community gardens of insect-pollinated species suggests that these environments provide resources and nesting sites for pollinators, which in turn contribute to maintaining these plants. The role of spontaneous species in supporting pollinating insect populations has been largely highlighted (Ahrné, Bengtsson, & Elmqvist, 2009; Makinson, Threlfall, & Latty, 2017; Matteson, Ascher, & Langellotto, 2008; Robinson & Lundholm, 2012). In our studied gardens, we found plants that provide nectar or pollen for insects (e.g., *Cirsium arvense*, *Cirsium vulgare* (Shwartz et al., 2013), plants that are highly attractive for bees (e.g., *Borago officinalis*, *Mentha* sp, *Lavandula angustifolia* (Makinson et al., 2017) or butterflies (e.g., *Buddleja davidii*) (Tallent-Halsell & Watt, 2009). We mostly found polycarpic plants (flowering and fruiting several times during their life). As Lososová, Chytrý, & Kühn (2007) stated in a study conducted in arable lands in Czech Republic, this could be an effective strategy to increase their chances of cross-pollination and seed output.

Almost half of the spontaneous species found in the gardens showed tolerance to variation in several environmental parameters including temperature, continentality, atmospheric humidity, soil moisture and nitrogen or even soil reaction which indicates a certain degree of generalism. However, we also found plants with high affinity to light, atmospheric humidity and temperature, which could reflect adaptation to the urban heat island effect (Grimm et al., 2008). We found plants with a marked preference for soils with alkaline and moderate pH, as well as many nitrophilous species. The presence of nitrophilous species is consistent with studies conducted in Brussels (Godefroid, 2001) or Berlin (Sukopp, Blume, & Kunick, 1979), as well as with a study developed through an urbanization gradient in a medium sized city (50km²), that revealed an increase in nitrate concentration and nitrophilous vegetation along with urbanization (Pellissier, Rozé, Aguejda, Quénot, & Clergeau, 2008). The preference score of these plants for these specific environmental characteristics likely highlights the existence of specific filters and constraints due to urban environments.

4.2 Diversity in land uses and age matters, not size

We found a significant and positive effect of the number of land use categories on both species richness and functional richness of spontaneous species. In the same manner, Shwartz et al. (2013) showed that small urban public gardens with higher habitat diversity support a higher species richness of spontaneous plants and pollinators; Madre et al. (2014) found the same effect on green roofs. Several other studies have suggested that high urban plant diversity is caused by the extensive habitat heterogeneity found in urban areas produced by highly diverse land use (Kowarik, 1995; Kühn, Brandl, & Klotz, 2004; McKinney, 2008). Following the theory of intermediate disturbance hypothesis (Blair, 2001; McKinney, 2008), the diversity of land uses in the community gardens provides ecological niches and habitats for plants

due to a variety of substrates, light exposition, water supplies, management or microclimatic conditions.

The slightly significant positive effect of the garden age on species richness is consistent with other studies such as Madre et al. (2014), who found a positive relationship between species richness and the age of the green roofs. However, we did not find any relationship between the size of the gardens and neither their species richness nor their functional richness of spontaneous plants. This is in contradiction with the cornerstone ecological species-areas relationship (reviewed by Lomolino, 2000).

4.3. Perspectives: toward ecological landscape planning

Our results highlighted that in highly urbanized and managed ecosystems, the settlement of spontaneous plant species is not conditioned by the size of a natural space: more space does not necessarily guarantee more species. On the opposite, human practices play a major role in the diversity of urban nature. The diversity of gardening practices depends on several underlying mechanisms. The first one refers on the ecological sensitivity and interest of the gardeners: in some gardens for instance, experimental practices such as experimental crops, permaculture or crops in bins have been implemented. This means that beyond garden size, to ensure spontaneous plants richness gardeners should enhance the opportunities for these plants to settle and for this purpose they must provide diverse types of habitats and microclimates, characterized by different types of substrates, light exposition, water supply or management, etc. This is consistent with Loram, Warren, Thompson, & Gaston (2011) and Smith, Thompson, et al., (2006) who proposed that gardener's needs or interests are reflected in gardens' management. However, in addition to individual involvement in the gardening, we propose here that the variety of land uses that we found in the community gardens (up to 15 different practices) is related to the collective management of these CG that is required by the agree-

ment they signed with the local authorities or land owners. Various needs and interests take place in these gardens, and gardeners altogether form communities that discuss and share management practices in the gardens (Torres et al., in press).

In addition to collective management, the formal agreement that gardeners sign states a certain number of regulations and duties, such as the forbidden planting of trees and shrubs, and the forbidden use of chemical products to grow plants in the garden. These norms might have mixed effects. On the one hand, the prohibited use of chemicals may have encouraged progressive shift in the common French representation of what a garden should be (i.e. from very much controlled and totally devoid of spontaneous plants towards the acceptance of weeds, see: Clément, 2012). In turn, more ecological-friendly representations and interests can encourage more ecological practices and the settlement of spontaneous species in the garden. On the other hand, the prohibition of growing trees and shrubs might have ecological consequences (e.g. less habitats undermining the installation of a widest range of taxa with complex life cycles, see: (Fontana, Sattler, Bontadina, & Moretti, 2011; Smith, Warren, et al., 2006) as well as consequences in human-nature relationships (e.g. symbols and rituals associated with tree planting, see: Krasny, Crestol, Tidball, & Stedman, 2014). Besides, our results also suggest the importance of long-term or permanent duration agreements between the gardens and land owners, for the settlement of urban spontaneous species.

5. Conclusion

We showed here that the small patches of green spaces represented by community gardens can contribute to general urban conservation efforts (Goddard et al., 2010), especially in the center of a large and dense metropolis. This effect depends on specific conditions, notably the age of the garden and the diversity of gardening practices within the garden. Collective man-

agement of these small patches seems to be of prominent importance in the settlement of diversified plant communities in terms of species number and ecological preferences.

These results send a strong message because they show that gardening practices as well as stakeholders decisions (e.g. providing a place to develop CG) have a positive impact on conservation.

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References

- Adams, L. (2005). Urban wildlife ecology and conservation: A brief history of the discipline. *Urban Ecosystems*, 8, 139–156.
- Aggéri, G. (2010). *Inventer les villes-natures de demain: gestion différenciée, gestion durable des espaces verts*. Dijon: Éducagri.
- Ahrné, K., Bengtsson, J., & Elmqvist, T. (2009). Bumble Bees (*Bombus* spp) along a Gradient of Increasing Urbanization. *PLoS ONE*, 4(5), e5574. <https://doi.org/10.1371/journal.pone.0005574>
- Andersson, E., Barthel, S., Borgström, S., Colding, J., Elmqvist, T., Folke, C., & Gren, Å. (2014). Reconnecting Cities to the Biosphere: Stewardship of Green Infrastructure and Urban Ecosystem Services. *AMBIO*, 43(4), 445–453. <https://doi.org/10.1007/s13280-014-0506-y>
- Armstrong, D. (2000). A survey of community gardens in upstate New York: Implications for health promotion and community development. *Health & Place*, 6, 319–327.

- Barbosa, O., Tratalos, J. A., Armsworth, P. R., Davies, R. G., Fuller, R. A., Johnson, P., & Gaston, K. J. (2007). Who benefits from access to green space? A case study from Sheffield, UK. *Landscape and Urban Planning*, 83(2–3), 187–195. <https://doi.org/10.1016/j.landurbplan.2007.04.004>
- Baudelet, L., Basset, F., & Le Roy, A. (2008). *Jardins partagés : Utopie, écologie, conseils pratiques*. Mens: Terre Vivante Editions.
- Bendt, P., Barthel, S., & Colding, J. (2013). Civic greening and environmental learning in public-access community gardens in Berlin. *Landscape and Urban Planning*, 109(1), 18–30. <https://doi.org/10.1016/j.landurbplan.2012.10.003>
- Blair, D., Giesecke, C. C., & Sherman, S. (1991). A dietary, social and economic evaluation of the Philadelphia urban gardening project. *Journal of Nutrition Education*, 23(4), 161–167. [https://doi.org/10.1016/S0022-3182\(12\)81191-5](https://doi.org/10.1016/S0022-3182(12)81191-5)
- Blair, R. (2001). Birds and butterflies along urban gradients in two ecoregions of the U.S. In *Biotic homogenization* (pp. 33–56). Kluwer, New York: Lockwood JL, McKinney ML.
- Cannon, A. (1999). The significance of private gardens for bird conservation. *Bird Conservation International*, 9(04), 287–297. <https://doi.org/10.1017/S095927090000349X>
- Cannon, A. R., Chamberlain, D. E., Toms, M. P., Hatchwell, B. J., & Gaston, K. J. (2005). Trends in the use of private gardens by wild birds in Great Britain 1995-2002: Garden bird trends. *Journal of Applied Ecology*, 42(4), 659–671. <https://doi.org/10.1111/j.1365-2664.2005.01050.x>
- Chiesura, A. (2004). The role of urban parks for the sustainable city. *Landscape and Urban Planning*, 68(1), 129–138. <https://doi.org/10.1016/j.landurbplan.2003.08.003>
- Clayton, S., Colléony, A., Conversy, P., Maclouf, E., Martin, L., Torres, A.-C., ... Prévot, A.-C. (2017). Transformation of Experience: Toward a New Relationship with Nature: New experiences of nature. *Conservation Letters*. <https://doi.org/10.1111/conl.12337>

- Clément, G. (2012). *Jardins, paysage et génie naturel*. Paris: Collège de France : Fayard.
- Corrigan, M. P. (2011). Growing what you eat: Developing community gardens in Baltimore, Maryland. *Applied Geography*, 31(4), 1232–1241. <https://doi.org/10.1016/j.apgeog.2011.01.017>
- D’Abundo, M. L., & Carden, A. M. (2008). “Growing Wellness”: The Possibility of Promoting Collective Wellness through Community Garden Education Programs. *Community Development*, 39(4), 83–94. <https://doi.org/10.1080/15575330809489660>
- Diamond, J. M. (1975). *Assembly of species communities* (Belnap Press of Harvard University Press). Cambridge: M. L. Cody and J. M. Diamond.
- Doyle, R., & Krasny, M. (2003). Participatory Rural Appraisal as an Approach to Environmental Education in Urban Community Gardens. *Environmental Education Research*, 9(1), 91–115. <https://doi.org/10.1080/13504620303464>
- Drake, L., & Lawson, L. J. (2014). Validating verdancy or vacancy? The relationship of community gardens and vacant lands in the U.S. *Cities*, 40, 133–142. <https://doi.org/10.1016/j.cities.2013.07.008>
- Eggenberg, S., Möhl, A., & Purro, C. (2013). *Flora Vegetativa: un guide pour déterminer les plantes de Suisse à l’état végétatif*. Bussigny: Rossolis.
- Elmqvist, T., Setälä, H., Handel, S., van der Ploeg, S., Aronson, J., Blignaut, J., ... de Groot, R. (2015). Benefits of restoring ecosystem services in urban areas. *Current Opinion in Environmental Sustainability*, 14, 101–108. <https://doi.org/10.1016/j.cosust.2015.05.001>
- Ferris, J., Norman, C., & Sempik, J. (2001). People, land and sustainability: community gardens and the social dimension of sustainable development. *Social Policy & Administration*, 35(5), 559–568.

- Fetridge, E. D., Ascher, J. S., & Langellotto, G. A. (2008). The Bee Fauna of Residential Gardens in a Suburb of New York City (Hymenoptera: Apoidea). *Annals of the Entomological Society of America*, 101(6), 1067–1077. <https://doi.org/10.1603/0013-8746-101.6.1067>
- Fontana, S., Sattler, T., Bontadina, F., & Moretti, M. (2011). How to manage the urban green to improve bird diversity and community structure. *Landscape and Urban Planning*, 101(3), 278–285. <https://doi.org/10.1016/j.landurbplan.2011.02.033>
- French, K., Major, R., & Hely, K. (2005). Use of native and exotic garden plants by suburban nectarivorous birds. *Biological Conservation*, 121(4), 545–559. <https://doi.org/10.1016/j.biocon.2004.06.004>
- Gaston, K. J. (2010). Valuing Common Species. *Science*, 327(5962), 154–155. <https://doi.org/10.1126/science.1182818>
- Gaston, K. J., Cush, P., Ferguson, S., Frost, P., Gaston, S., Knight, D., ... Warren, P. H. (2007). Improving the contribution of urban gardens for wildlife: some guiding propositions. *British Wildlife*, 18(3), 171–177.
- Goddard, M. A., Dougill, A. J., & Benton, T. G. (2010). Scaling up from gardens: biodiversity conservation in urban environments. *Trends in Ecology & Evolution*, 25(2), 90–98. <https://doi.org/10.1016/j.tree.2009.07.016>
- Godefroid, S. (2001). Temporal analysis of the Brussels flora as indicator for changing environmental quality. *Landscape and Urban Planning*, 52(4), 203–224. [https://doi.org/10.1016/S0169-2046\(00\)00117-1](https://doi.org/10.1016/S0169-2046(00)00117-1)
- González-Ball, R., Bermúdez-Rojas, T., & Romero-Vargas, M. (2017). Floristic composition and richness of urban domestic gardens in three urban socioeconomic stratifications in the city Heredia, Costa Rica. *Urban Ecosystems*, 20(1), 51–63. <https://doi.org/10.1007/s11252-016-0587-4>

- Grimm, N. B., Faeth, S. H., Golubiewski, N. E., Redman, C. L., Wu, J., Bai, X., & Briggs, J. M. (2008). Global Change and the Ecology of Cities. *Science*, 319(5864), 756–760. <https://doi.org/10.1126/science.1150195>
- Guitart, D., Pickering, C., & Byrne, J. (2012). Past results and future directions in urban community gardens research. *Urban Forestry & Urban Greening*, 11(4), 364–373. <https://doi.org/10.1016/j.ufug.2012.06.007>
- Irvine, S., Johnson, L., & Peters, K. (1999). Community gardens and sustainable land use planning: A case-study of the Alex Wilson community garden. *Local Environment*, 4(1), 33–46. <https://doi.org/10.1080/13549839908725579>
- Jarošík, V., Konvička, M., Pyšek, P., Kadlec, T., & Beneš, J. (2011). Conservation in a city: Do the same principles apply to different taxa? *Biological Conservation*, 144(1), 490–499. <https://doi.org/10.1016/j.biocon.2010.10.002>
- Jauzein, P., & Nawrot, O. (2013). *Flore d'Ile-de-France: clés de détermination, taxonomie, statuts*.
- Kaplan, R. (1973). Some Psychological Benefits of Gardening. *Environment and Behavior*, 5(2), 145–162. <https://doi.org/10.1177/001391657300500202>
- Kendal, D., Williams, N. S. G., & Williams, K. J. H. (2010). Harnessing diversity in gardens through individual decision makers. *Trends in Ecology & Evolution*, 25(4), 201–202. <https://doi.org/10.1016/j.tree.2009.12.006>
- Klotz, S., Kühn, I., & Durka, W. (2002). BIOLFLOR — Eine Datenbank zu biologisch-ökologischen Merkmalen der Gefäßpflanzen in Deutschland. *Schriftenreihe Für Vegetationskunde*, 38. Bundesamt Für Naturschutz.
- Kowarik, I. (1995). On the role of alien species in urban flora and vegetation. In *Plant invasions-general aspects and special problems* (SPB Academic Publishing, pp. 85–103). Amsterdam: Pyšek P, Prach K, Rejmánek M, Wade M.

- Krasny, M., & Doyle, R. (2002). Participatory approaches to program development and engaging youth in research: the case of an inter-generational urban community gardening program. *Journal of Extension*, 40(5).
- Krasny, M. E., Crestol, S. R., Tidball, K. G., & Stedman, R. C. (2014). New York City's oyster gardeners: Memories and meanings as motivations for volunteer environmental stewardship. *Landscape and Urban Planning*, 132, 16–25. <https://doi.org/10.1016/j.landurbplan.2014.08.003>
- Krasny, M. E., & Tidball, K. G. (2012). Civic ecology: a pathway for Earth Stewardship in cities. *Frontiers in Ecology and the Environment*, 10(5), 267–273. <https://doi.org/10.1890/110230>
- Kühn, I., Brandl, R., & Klotz, S. (2004). The flora of German cities is naturally species rich. *Evolutionary Ecology Research*, 6, 749–764.
- Lomolino, M. V. (2000). Ecology's most general, yet protean 1 pattern: the species-area relationship. *Journal of Biogeography*, 27(1), 17–26. <https://doi.org/10.1046/j.1365-2699.2000.00377.x>
- Loram, A., Thompson, K., Warren, P. H., & Gaston, K. J. (2008). Urban domestic gardens (XII): The richness and composition of the flora in five UK cities. *Journal of Vegetation Science*, 19(3), 321–330. <https://doi.org/10.3170/2008-8-18373>
- Loram, A., Warren, P., Thompson, K., & Gaston, K. (2011). Urban Domestic Gardens: The Effects of Human Interventions on Garden Composition. *Environmental Management*, 48(4), 808–824. <https://doi.org/10.1007/s00267-011-9723-3>
- Lososová, Z., Chytrý, M., & Kühn, I. (2007). Plant attributes determining the regional abundance of weeds on central European arable land. *Journal of Biogeography*, 0(0), 070908043732002–??? <https://doi.org/10.1111/j.1365-2699.2007.01778.x>

- Machon, N., & Motard, E. (2012). *Sauvages de ma rue: guide des plantes sauvages des villes de France*. Paris; [Paris: Passage ; Muséum national d'histoire naturelle.
- Madre, F., Clergeau, P., Machon, N., & Vergnes, A. (2015). Building biodiversity: Vegetated façades as habitats for spider and beetle assemblages. *Global Ecology and Conservation*, 3, 222–233. <https://doi.org/10.1016/j.gecco.2014.11.016>
- Madre, F., Vergnes, A., Machon, N., & Clergeau, P. (2014). Green roofs as habitats for wild plant species in urban landscapes: First insights from a large-scale sampling. *Landscape and Urban Planning*, 122, 100–107.
- Mairie de Paris. (2012a). La Charte Main Verte des Jardins Partagés de Paris. Retrieved from <http://api-site-cdn.paris.fr/images/123236.pdf>
- Mairie de Paris. (2012b). Programme des Jardins Partagés “Main Vert”. Convention cadre d’occupation et d’usage pour la gestion d’un jardin collectif. Retrieved from <https://api-site.paris.fr/images/123237.pdf>
- Mairie de Paris. (2016). Jardins partagés parisiens. Retrieved from <https://api-site-cdn.paris.fr/images/93671>
- Makinson, J. C., Threlfall, C. G., & Latty, T. (2017). Bee-friendly community gardens: Impact of environmental variables on the richness and abundance of exotic and native bees. *Urban Ecosystems*, 20(2), 463–476. <https://doi.org/10.1007/s11252-016-0607-4>
- Marzluff, J. M., Bowman, R., & Donnelly, R. (2001). *Avian ecology and conservation in an urbanizing world*. New York: Springer Science+Business Media, LLC. Retrieved from <http://site.ebrary.com/id/10649439>
- Mathieu, R., Freeman, C., & Aryal, J. (2007). Mapping private gardens in urban areas using object-oriented techniques and very high-resolution satellite imagery. *Landscape and Urban Planning*, 81(3), 179–192. <https://doi.org/10.1016/j.landurbplan.2006.11.009>

- Matteson, K. C., Ascher, J. S., & Langellotto, G. A. (2008). Bee Richness and Abundance in New York City Urban Gardens. *Annals of the Entomological Society of America*, 101(1), 140–150. [https://doi.org/10.1603/0013-8746\(2008\)101\[140:BRAAIN\]2.0.CO;2](https://doi.org/10.1603/0013-8746(2008)101[140:BRAAIN]2.0.CO;2)
- McKinney, M. L. (2006). Urbanization as a major cause of biotic homogenization. *Biological Conservation*, 127(3), 247–260. <https://doi.org/10.1016/j.biocon.2005.09.005>
- McKinney, M. L. (2008). Effects of urbanization on species richness: A review of plants and animals. *Urban Ecosystems*, 11(2), 161–176. <https://doi.org/10.1007/s11252-007-0045-4>
- Miller, J. R., & Hobbs, R. J. (2002). Conservation Where People Live and Work. *Conservation Biology*, 16(2), 330–337. <https://doi.org/10.1046/j.1523-1739.2002.00420.x>
- Muratet, A., & Fontaine, B. (2015). Contrasting impacts of pesticides on butterflies and bumblebees in private gardens in France. *Biological Conservation*, 182, 148–154. <https://doi.org/10.1016/j.biocon.2014.11.045>
- Muratet, A., Pellegrini, P., Dufour, A.-B., Arrif, T., & Chiron, F. (2015). Perception and knowledge of plant diversity among urban park users. *Landscape and Urban Planning*, 137, 95–106. <https://doi.org/10.1016/j.landurbplan.2015.01.003>
- Muratet, A., Porcher, E., Devictor, V., Arnal, G., Moret, J., Wright, S., & Machon, N. (2008). Evaluation of floristic diversity in urban areas as a basis for habitat management. *Applied Vegetation Science*, 11(4), 451–460. <https://doi.org/10.3170/2008-7-18530>
- Pellissier, V., Rozé, F., Aguejdad, R., Quénot, H., & Clergeau, P. (2008). Relationships between soil seed bank, vegetation and soil fertility along an urbanisation gradient. *Applied Vegetation Science*, 11(3), 325–334. <https://doi.org/10.3170/2008-7-18448>

- Penone, C., Machon, N., Julliard, R., & Le Viol, I. (2012). Do railway edges provide functional connectivity for plant communities in an urban context? *Biological Conservation*, 148(1), 126–133. <https://doi.org/10.1016/j.biocon.2012.01.041>
- Robinson, S. L., & Lundholm, J. T. (2012). Ecosystem services provided by urban spontaneous vegetation. *Urban Ecosystems*, 15(3), 545–557. <https://doi.org/10.1007/s11252-012-0225-8>
- Shwartz, A., Muratet, A., Simon, L., & Julliard, R. (2013). Local and management variables outweigh landscape effects in enhancing the diversity of different taxa in a big metropolis. *Biological Conservation*, 157, 285–292. <https://doi.org/10.1016/j.biocon.2012.09.009>
- Shwartz, A., Turbé, A., Simon, L., & Julliard, R. (2014). Enhancing urban biodiversity and its influence on city-dwellers: An experiment. *Biological Conservation*, 171, 82–90. <https://doi.org/10.1016/j.biocon.2014.01.009>
- Smith, Richard M., Gaston, K. J., Warren, P. H., & Thompson, K. (2006). Urban domestic gardens (VIII): environmental correlates of invertebrate abundance. *Biodiversity and Conservation*, 15(8), 2515–2545. <https://doi.org/10.1007/s10531-005-2784-y>
- Smith, Richard M., Warren, P. H., Thompson, K., & Gaston, K. J. (2006). Urban domestic gardens (VI): environmental correlates of invertebrate species richness. *Biodiversity and Conservation*, 15(8), 2415–2438. <https://doi.org/10.1007/s10531-004-5014-0>
- Smith, R.M., Thompson, K., Hodgson, J. G., Warren, P. H., & Gaston, K. J. (2006). Urban domestic gardens (IX): Composition and richness of the vascular plant flora, and implications for native biodiversity. *Biological Conservation*, 129(3), 312–322. <https://doi.org/10.1016/j.biocon.2005.10.045>
- Soga, M., & Gaston, K. (2016). Extinction of experience: the loss of human-nature interactions. *Frontiers in Ecology and the Environment*, 14(2), 94–101.

- Soga, M., Gaston, K. J., & Yamaura, Y. (2017). Gardening is beneficial for health: A meta-analysis. *Preventive Medicine Reports*, 5, 92–99. <https://doi.org/10.1016/j.pmedr.2016.11.007>
- Somerset, S., Ball, R., Flett, M., & Geissman, R. (2005). School-based community gardens: re-establishing healthy relationships with food. *Journal of the HEIA*, 12(2).
- Sperling, C. D., & Lortie, C. J. (2010). The importance of urban backgardens on plant and invertebrate recruitment: a field microcosm experiment. *Urban Ecosystems*, 13(2), 223–235. <https://doi.org/10.1007/s11252-009-0114-y>
- Stocker, L., & Barnett, K. (1998). The significance and praxis of community-based sustainability projects: Community gardens in western Australia. *Local Environment*, 3(2), 179–189. <https://doi.org/10.1080/13549839808725556>
- Streeter, D., Hardcastle, A., Hart-Davies, C., Cole, F., & Harper, L. (2011). *Guide Delachaux des fleurs de France et d'Europe*. Lonay (Suisse): Delachaux et Niestlé.
- Sukopp, H., Blume, H.-P., & Kunick, W. (1979). The soil, flora and vegetation of Berlin's waste lands. In *Nature in Cities* (Chichester, pp. 115–132). UK.
- Torres, A. C., Nadot, S., & Prévot, A.-C. (2017). Specificities of French community gardens as environmental stewardships. *Ecology and Society*.
- Torres, A. C., Prévot, A.-C., Nadot, S., Zheng, C., Martin, G., & Vergnes, A. (2017). Habitat heterogeneity in community gardens promotes spontaneous plants richness. *Manuscript Submitted for Publication*.
- Vergnes, A., Kerbirou, C., & Clergeau, P. (2013). Ecological corridors also operate in an urban matrix: A test case with garden shrews. *Urban Ecosystems*, 16(3), 511–525.
- Vergnes, A., Viol, I. L., & Clergeau, P. (2012). Green corridors in urban landscapes affect the arthropod communities of domestic gardens. *Biological Conservation*, 145(1), 171–178. <https://doi.org/10.1016/j.biocon.2011.11.002>

Appendix 1 Detail of land uses

Garden	Aux habitants	Blanc Manteaux	Deux Lauriers	Héroid	Leroy Sème	Perlimpinpin	Périchaux	Poterne des Peupliers	Ruisseau	Victor Schoelcher
Land use										
Edible area	✓	✓	✓	✓	✓	✓	✓	✓		
Pedestrian area			✓	✓				✓	✓	
Grassland	✓		✓	✓	✓		✓	✓		
Permaculture area			✓	✓			✓	✓		
Leisure area								✓		✓
Ornamental area	✓	✓	✓	✓	✓	✓	✓			✓
Paths between plots	✓	✓	✓	✓		✓	✓			✓
Managed area					✓	✓		✓		✓
Unmanaged area				✓		✓	✓			
Rock structures			✓	✓	✓	✓	✓			
Experimental area				✓						
Aromatic area		✓		✓	✓		✓	✓		
Area for off-ground plantations	✓		✓		✓		✓	✓	✓	
Boundary			✓		✓		✓	✓	✓	
Ponds					✓				✓	

Appendix 2 Spontaneous plants list

<i>Abies alba</i>	<i>Chenopodium album</i>
<i>Acanthus mollis</i>	<i>Choisya ternata</i>
<i>Acer pseudoplatanus</i>	<i>Cirsium arvense</i>
<i>Acer sp</i>	<i>Cirsium vulgare</i>
<i>Achillea millefolium</i>	<i>Citrus sp</i>
<i>Agrostis stolonifera</i>	<i>Clematis vitalba</i>
<i>Alcea rosea</i>	<i>Coreopsis sp</i>
<i>Alchemilla xanthochlora</i>	<i>Cornus sanguinea</i>
<i>Anthriscus sylvestris</i>	<i>Corylus avellana</i>
<i>Aphanes arvensis</i>	<i>Cotoneaster dielsianus</i>
<i>Aquilegia vulgaris</i>	<i>Crataegus monogyna</i>
<i>Artemisia annua</i>	<i>Crepis sp</i>
<i>Artemisia vulgaris</i>	<i>Cyanus montanus</i>
<i>Arum italicum</i>	<i>Cymbalaria muralis</i>
<i>Azolla filiculoides</i>	<i>Cynodon dactylon</i>
<i>Ballota nigra</i>	<i>Dactylis glomerata</i>
<i>Bellis perennis</i>	<i>Daucus carota</i>
<i>Berula erecta</i>	<i>Dianthus sp</i>
<i>Beta vulgaris</i>	<i>Duchesnea indica</i>
<i>Borago officinalis</i>	<i>Elytrigia repens</i>
<i>Briza media</i>	<i>Epilobium hirsutum</i>
<i>Bromus sterilis</i>	<i>Equisetum sp</i>
<i>Buddleja davidii</i>	<i>Erigeron karvinskianus</i>
<i>Calendula officinalis</i>	<i>Erigeron sp</i>
<i>Caltha palustris</i>	<i>Erophila verna</i>
<i>Calystegia sp</i>	<i>Eruca vesicaria</i>
<i>Campanula persicifolia</i>	<i>Erysimum cheiri</i>
<i>Campanula portenschlagiana</i>	<i>Euphorbia characias</i>
<i>Campanula poscharskyana</i>	<i>Euphorbia helioscopia</i>
<i>Campanula sp</i>	<i>Euphorbia peplus</i>
<i>Cardamine hirsuta</i>	<i>Festuca glauca</i>
<i>Carex pendula</i>	<i>Ficaria verna</i>
<i>Carex sp</i>	<i>Ficus sp</i>
<i>Carex sylvatica</i>	<i>Filipendula ulmaria</i>
<i>Centaurea nigra</i>	<i>Foeniculum vulgare</i>
<i>Centranthus ruber</i>	<i>Fragaria sp</i>
<i>Cerastium sp</i>	<i>Fragaria vesca</i>
<i>Ceratophyllum demersum</i>	<i>Fumaria officinalis</i>
<i>Cercis siliquastrum</i>	<i>Fumaria sp</i>
<i>Chelidonium majus</i>	<i>Galium aparine</i>

<i>Galium mollugo</i>	<i>Lysimachia arvensis</i>
<i>Genista sp</i>	<i>Lysimachia nummularia</i>
<i>Geranium dissectum</i>	<i>Lysimachia vulgaris</i>
<i>Geranium macrorrhizum</i>	<i>Malus sp</i>
<i>Geranium molle</i>	<i>Malva moschata</i>
<i>Geranium renardii</i>	<i>Malva neglecta</i>
<i>Geranium robertianum</i>	<i>Malva sp</i>
<i>Geranium rotundifolium</i>	<i>Malva sylvestris</i>
<i>Geum urbanum</i>	<i>Matricaria chamomilla</i>
<i>Glechoma hederacea</i>	<i>Matricaria sp</i>
<i>Globularia vulgaris</i>	<i>Medicago arabica</i>
<i>Hedera helix</i>	<i>Medicago lupulina</i>
<i>Helminthotheca echinoides</i>	<i>Medicago minima</i>
<i>Hibiscus syriacus</i>	<i>Medicago sativa</i>
<i>Hordeum murinum</i>	<i>Medicago sp</i>
<i>Hyacinthoides non-scripta</i>	<i>Melissa officinalis</i>
<i>Hydrangea macrophylla</i>	<i>Mentha sp</i>
<i>Hypericum sp</i>	<i>Mercurialis annua</i>
<i>Hypochaeris radicata</i>	<i>Muscari neglectum</i>
<i>Impatiens balfouri</i>	<i>Myosotis arvensis</i>
<i>Jacobaea maritima</i>	<i>Myosotis scorpioides</i>
<i>Jacobaea vulgaris</i>	<i>Myosotis sp</i>
<i>Kerria japonica</i>	<i>Myriophyllum aquaticum</i>
<i>Knautia arvensis</i>	<i>Nigella damascena</i>
<i>Lactuca serriola</i>	<i>Nymphaea candida</i>
<i>Lactuca virosa</i>	<i>Oxalis corniculata</i>
<i>Lamium album</i>	<i>Oxalis fontana</i>
<i>Lamium amplexicaule</i>	<i>Oxalis pes caprae</i>
<i>Lamium maculatum</i>	<i>Paeonia sp</i>
<i>Lamium purpureum</i>	<i>Papaver rhoeas</i>
<i>Lapsana communis</i>	<i>Papaver somniferum</i>
<i>Lathyrus sp</i>	<i>Parietaria judaica</i>
<i>Laurus nobilis</i>	<i>Parthenocissus quinquefolia</i>
<i>Laurus sp</i>	<i>Passiflora sp</i>
<i>Lavandula angustifolia</i>	<i>Pastinaca sativa</i>
<i>Leucanthemum vulgare</i>	<i>Paulownia tomentosa</i>
<i>Ligustrum lucidum</i>	<i>Petasites sp</i>
<i>Ligustrum ovalifolium</i>	<i>Petroselinum sp</i>
<i>Limnanthes douglasii</i>	<i>Phacelia tanacetifolia</i>
<i>Lobularia maritima</i>	<i>Picris hieracioides</i>
<i>Lunaria annua</i>	<i>Pinus sylvestris</i>
<i>Lupinus arboreus</i>	<i>Plantago lanceolata</i>

<i>Plantago major</i>	<i>Silene latifolia</i>
<i>Poa annua</i>	<i>Sinapis arvensis</i>
<i>Poa trivialis</i>	<i>Sisymbrium irio</i>
<i>Populus nigra</i>	<i>Sisymbrium officinale</i>
<i>Potentilla reptans</i>	<i>Solanum dulcamara</i>
<i>Potentilla sterilis</i>	<i>Solanum tuberosum</i>
<i>Primula veris</i>	<i>Sonchus asper</i>
<i>Primula vulgaris</i>	<i>Sonchus oleraceus</i>
<i>Prunella vulgaris</i>	<i>Stellaria media</i>
<i>Prunus sp</i>	<i>Symphytum asperum</i>
<i>Pyrus communis</i>	<i>Symphytum officinale</i>
<i>Ranunculus acris</i>	<i>Tanacetum vulgare</i>
<i>Ranunculus bulbosus</i>	<i>Taraxacum campylodes</i>
<i>Ranunculus repens</i>	<i>Thuja plicata</i>
<i>Ribes nigrum</i>	<i>Thymus sp</i>
<i>Ribes sp</i>	<i>Tilia sp</i>
<i>Rosa canina</i>	<i>Trifolium pratense</i>
<i>Rosa sp</i>	<i>Tropaeolum sp</i>
<i>Rosmarinus officinalis</i>	<i>Urtica dioica</i>
<i>Rubus idaeus</i>	<i>Valeriana officinalis</i>
<i>Rubus sp</i>	<i>Valerianella locusta</i>
<i>Rumex crispus</i>	<i>Veronica arvensis</i>
<i>Rumex obtusifolius</i>	<i>Veronica hederifolia</i>
<i>Salvia microphylla</i>	<i>Veronica persica</i>
<i>Salvia sclarea</i>	<i>Viburnum tinus</i>
<i>Sambucus nigra</i>	<i>Vicia cracca</i>
<i>Sanguisorba minor</i>	<i>Vicia sativa</i>
<i>Sedum album</i>	<i>Vicia sp</i>
<i>Sedum palmeri</i>	<i>Vinca major</i>
<i>Sedum sp</i>	<i>Vinca minor</i>
<i>Senecio erucifolius</i>	<i>Wisteria sp</i>
<i>Senecio vulgaris</i>	

Chapitre 4

Small but powerful: residents' perceptions of urban community gardens in Paris

(In review)

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Highlights

- Community gardens permit to experience nature directly or indirectly
- Civic ecological practices are important for a general feeling of wellbeing in cities
- City dwellers are aware of the benefits provided by community gardens

Abstract

In big metropolises, the importance given to green spaces in urban planning strongly depends on the perceived importance of these places for city dwellers. Community gardens are increasingly implemented in cities, and much research has emphasized their roles for people volunteering in these gardens. To open the focus, we studied here the importance of these gardens for people living in their neighborhood, with the following questions: how familiar are the residents with the community garden? Which perceptions do they have of these places? Do they participate in the garden? We conducted a questionnaire survey next to 9 community gardens in Paris, France. Less than 40% of the respondents did know the activities in the nearby garden. However, almost 100% of interviewed people declared a good perception of the garden. If most people did not participate in the garden, 20% of interviewed people declared that they participate frequently, which appeared very high based on the actual activities in the studied gardens. These people declared also high nature concern and connectedness, and a high involvement in environmental and civic issues. These results strengthen the importance of community gardens, not only for the gardeners, but also for general feeling of well-being in the cities.

Key words: city dwellers; civic ecology practices; environmental stewardship; nature experiences, urban; greening initiatives

Introduction

Around the world, cities have been constructed predominantly in ways that have put natural elements aside to maintain inhabitants' safe from nature and its hazards (Larrère et al. 2015:76). This has resulted in a very low proportion of green spaces in most large metropolis all around the world: 1.9 square meters/inhabitant in Buenos Aires, 3 in Tokyo or 6.4 in Istanbul for instance.

Yet, urbanization and soil artificialization have been shown by some authors to function as processes that reinforce the desire of nature of citizens (Boudeau-Lepage, 2017; Larrère & Larrère, 2015). For instance, a survey conducted in England, France, Germany and Spain showed that 7 Europeans out of 10 integrate the proximity to a green space among their criteria to choose their living space (UNEP-IPSOS, 2013). Another survey in France showed that 8 people out of 10 frequent regularly a green space and that 6 people out of 10 consider the creation of green spaces in their city as the priority (UNEP, 2016). Accordingly, urban citizens have been shown to use green spaces in highly diverse ways, including encountering beauty, contemplating nature, sensory experiences, relaxation, recreation or environmental education among others (Bendt, Barthel, & Colding, 2013; Matsuoka & Kaplan, 2008; Torres et al., 2017).

Paris (France) is considered as one of the densest cities in the world (more than 21000 inhabitants/km²) (INSEE, 2014). This metropolis provides 14.5m² of green space per inhabitant (APUR, 2004) (compared with 120m² in Vienna, 47m² in Amsterdam or 27m² in London), and shows a growing number of greening initiatives at different levels. At the governance level, the current Paris local city plan (Plan local d'urbanisme, PLU) aims to “implement more green spaces” (Mairie de Paris, 2017); beyond keeping enhancing public squares, gardens or parks, the latest version of this management plan explicitly states that the municipality encourages the develop-

ment of urban agriculture on roofs and terraces, as well as the greening of public spaces, walls and vacant lands (Mairie de Paris, 2016). Two complementary initiatives have been implemented by the Paris local authorities: first, in the 2014-2020 period, 5% of the city investment budget (representing nearly half a billion euros) is devoted to the funding of selected citizen projects, through a participatory budget. From 2014 to 2016, funded projects have included distinct types of greening initiatives in public spaces, walls or schools, but also the implementation of orchards and community gardens. Second, the project named “les parisculteurs” aims to develop 100 hectares of urban agriculture in collaboration with corporates, public stakeholders and building owners. At the citizen level, environmental stewardships initiatives also known as civic-ecological practices emerged in the 1990s. Community gardens (CG), consisting of new environmental movements that are actively engaged in enhancing social-ecological systems (Tidball & Krasny, 2014), are one of these initiatives. In Paris, community gardens were first informally implemented by some citizen groups in vacant lands and have motivated local authorities to propose the program “Green Thumb of Paris”, to frame and guide the setting up of community gardens (Baudet, Basset, & Le Roy, 2008). The first claimed objective of the Paris municipality for supporting community gardens is to increase social cohesion and environmental awareness (Mairie de Paris, 2012).

Many studies around the world have highlighted CG benefits and outcomes, for example in fostering biodiversity, promoting environmental education or nutritional education (Guitart, Pickering, & Byrne, 2012). However, CG have also been criticized on the purpose of commonly triggering gentrification (Wolch, Byrne, & Newell, 2014) or because of human health risks of producing and consuming food grown in degraded or polluted environments (Brown & Jameton, 2000; Gallaher, Kerr, Njenga, Karanja, & WinklerPrins, 2013). Indeed, CG may affect gardeners’

lives as well as the neighbors and more widely city social-ecological systems (Torres et al. 2017; Tidball & Krasny, 2007). The literature about CG is abundant (Guitart, Pickering, & Byrne, 2012), but most papers focus on people volunteering in the gardens (e.g. Torres et al. 2017). To our knowledge, no study has been devoted so far to the awareness and positioning of the neighbors (i.e. the residents) about CG.

Yet, understanding and taking into account the perception and knowledge of residents is of high importance, from at least two perspectives: first, it can help improving the design, management and attractiveness of urban green spaces (e.g. Muratet et al. 2015). Second, it can help engaging people to participate in conservation programs (Shwartz, Turbé, Simon, & Julliard, 2014; Sakurai, Kobori, Nakamura, & Kikuchi, 2015). This is needed in a global context of predominant urbanization and western way of life, which induces both a loss of opportunities and a loss of inclinations to go to natural places and experience nature, affecting in turn the importance assigned to nature (Soga & Gaston, 2016). Stopping this deleterious process not only requires opportunities to be in contact with nature, but also meaningful opportunities to experience nature (Clayton et al., 2017). In particular, experiences of nature are continuously building on each other to enrich the relationships of individuals with nature (Clayton et al., 2017). Notably, regular experiences of nature, especially during childhood, seem to be necessary to develop pro-environmental attitudes, which are defined as the concern for the environment or caring about environmental issues (Hinds & Sparks 2008; Wells & Lekies 2006). Yet, high pro-environmental attitude plays a major role in acceptance of environmental policies or management actions (Winter, Esler, & Kidd, 2005).

In this context, it is essential to investigate how urban greening initiatives are appreciated and incorporated in citizens' everyday life, and how they may be linked to pro-environmental atti-

tudes. Understanding citizens' appreciations, knowledge and participation in these initiatives will help identifying gaps in the implementation and management of urban green spaces.

In this study, we explored how community gardens are perceived, known and appreciated by people living in the neighborhood. More specifically, we asked the following questions: 1) How familiar residents are with CG in their neighborhood? 2) Which perceptions do they have of these places? 3) Do residents participate in CG and which factors could influence participation? We explored in particular the roles of experiences of nature, environmental concern and involvement, and civic involvement. To answer these questions we used a questionnaire survey toward more than 400 inhabitants close to nine urban community gardens in Paris, France.

2. Research methods

2.1. Study area

Paris, the capital of France, is situated in the Ile-the-France region, which is the most densely populated region in France (12 million inhabitants) (INSEE, 2013). Paris city is 105.5 km² wide if including the “Bois de Boulogne” and “Bois de Vincennes” forest, and has a population of more than 2 200 000 inhabitants. The urban population of Paris is traditionally contrasted between the West and the East, with bourgeois neighborhoods in the West and more popular neighborhoods in the East. Nevertheless, Paris has been widely confronted to a gentrification process since 1950's. The ethnic dimension is related to social level, thus popular districts are also those with the most immigrants (Pinçon & Pinçon-Charlot, 2014).

2.2. Formally settled CG in Paris

Formally settled CGs are public gardens managed collectively by volunteers involved in a dedicated association with nonprofit goals. The association must sign an official agreement with the local authorities, which specifies the modalities of occupancy and use of the dedicated vacant land, activities and objectives of the association, duties of the association and duration of the agreement. Municipality duties are also stated in the convention (Mairie de Paris 2012a). In addition, the association must sign up the agreement “Green Thumb Charter” (*Charte Main Verte*, in French), and implement participative frameworks to increase social cohesion and environmental respect (Mairie de Paris 2012b). These gardens occupy vacant lands owned by public or private sector, and generally temporarily abandoned, before a new assignation or a planned construction. Apart from these common rules, CG in Paris are highly heterogeneous: they host edible or ornamental plants or a combination of both, in dedicated parcels, their size varies widely and they may be inserted or not in another green space. However, most of them have an enclosure (Baudelet et al., 2008), which makes their status ambiguous between public and private (Baudry, Scapino, & Rémy, 2014) even though gardeners must ensure their opening at least twice a week, and if the opening and closing hours as well as garden information must be displayed (Mairie de Paris, 2012; Torres et al. 2017).

2.3. Data collection

We conducted a questionnaire survey dedicated to urban citizens living close to nine gardens out of the 113 CGs in Paris (Mairie de Paris, 2016a). We selected gardens located in different districts of the city (Paris is geographically split in 20 districts), from more bourgeois to more popu-

lar neighborhoods. Also, we selected a diversity of gardens, according to their age, size, location, spatial and social organizations (Table 1).

From March to May 2015, we conducted a face-to-face questionnaire survey to people passing around the nine CGs. Every person passing close to the garden was asked to respond to the questionnaire. All the questionnaires started with a non-technical explanation about the general aim of the study, i.e. “to study social-ecological issues of community gardens”. They were written in French and asked only to French speaking residents. The questionnaire was anonymous and approved by the CNRS commission for individual rights.

We collected 431 full questionnaires in total, with 43 to 53 questionnaires around each garden (Table 1).

Table 1. Description of the nine studied CGs and number of interviewed people per garden

Garden	District	Location	Opening year	Size (m ²)	Social organization	Spatial organization	Nb interviewed people
Blanc Manteaux	III	In a courtyard surrounded by buildings	2010	100	Collective	Yes	45
Deux Lauriers Hérold	XII	In a vacant land	2012	500	Collective	Yes	48
	XIX	In a park	2013	600	Collective and individual	Yes	55
Leroy Sème Perlimpinpin	XX	In a vacant land	2005	600	Collective	Yes	53
	XVII	In a park	2008	170	Collective and individual	Yes	44
Périchaux	XV	In a courtyard surrounded by buildings	2009	350	Collective and individual	Yes	45
Poterne des Peupliers	XIII	In a land (where a basketball court was situated)	2009	80	Collective and individual	Yes	46
Ruisseau	XVIII	On the platform of an abandoned railway	2004	420	Collective and individual	Yes	52
Victor Schoelcher	X	Within a roundabout	2009	560	Collective	No	43

The questionnaire consisted on eight sets of questions:

- *Familiarity about the garden*: residents were asked about their general knowledge of the CG of their neighborhood, with the following question: Are you aware of the activities going on in the garden? (Q1) in a four-point Likert scales (1 not at all, 2 no, 3 yes a little, and 4 yes indeed).
- *Perception of the garden*: residents were asked to rank the three following propositions in a four-point Likert scales (1 strongly disagree, 2 disagree, 3 agree and 4 strongly agree): The existence of this garden is something good (Q2) -to improve our understanding of this subject we asked respondents to explain why they did or did not consider the garden as something “good”, in an open-ended question (Q2bis)-, This garden makes one want to go in (Q3), This garden is beautiful (Q4).
- *Participation in the garden*: residents were asked about their participation in the garden through a yes / no question (Q5). The respondents that did participate were invited to say how frequently they participate (Q6) in a five-point Likert scale (1 Rarely, 2 Several times a year, 3 Once a month, 4 Once a week to 5 Several days a week).
- *Environmental concern*. residents were asked with a five-point Likert scale (from 1 not worried at all to 5 very worried) about how much they are worried about the threats on biodiversity - the term “biodiversity” being defined as “all plant and animal species, as well as their interactions with the habitats and landscapes” (Q7).
- *Experiences of nature*: we invited respondents to assess the rurality level of their childhood environment in a five-level scale (metropolis, medium city, small town, village, hamlet) (Q8). This question did not ask directly about the experiences of nature during childhood, but French small towns and villages provide many more natural areas in the close neighborhood than large metropolis (Mathevet & Godet, 2015); we considered therefore this question as a proxy for childhood

experiences of nature (see Prévot et al., 2016). We asked also about the rurality of the place of their best souvenir (Q9) in a four-level scale (rural, quite rural, quite urban, urban).

- *Environmental involvement*: we asked respondents with a four-point Likert scale (1 Strongly disagree, 2 Disagree, 3 Agree and 4 Strongly agree) how much biodiversity-related issues influence their choice in elections (Q10) and how much they agree with the assertion that biodiversity protection is everyone's concern (Q11).

- *Civic involvement*: we asked how often they participate to formal neighborhood councils (Q12) and whether they are or used to be involved in one out of the four following associations: union, environmental NGO, political association, community supported agriculture (Q13).

- *Socio-demographic characteristics*: age, sex and socio-professional category (SPC) were asked in order to evaluate the personal characteristics of respondents.

2.4 Data analyses

The responses variables corresponding to our research questions are the questions Q1, Q2-Q4, and Q5. To increase the goodness-of-fit of the statistical models, we transformed the 4-points Likert variables Q1, Q2, Q3 and Q4 into binomial variables, by grouping the answers “not at all” and “no” (respectively “strongly disagree” and “disagree”) into the level “no” (respectively “disagree”), and the answers “yes a little” and “yes indeed” (respectively “agree” and “strongly agree”) into the level “yes” (respectively “agree”). Q5 was already computed as a binomial variable. We carried out statistical analyses using R.3.0.2 software (R Core Team, 2013).

2.4.1 Residents' familiarity and perception of the gardens

We compared the answers to questions 1 to 4 separately, according to respondents' age, sex and SPC, as well as among the nine gardens. We used generalized linear models with a binomial error, with the recoded binomial variables as dependent variable. To understand the resulting differences found among gardens, we further described each garden by two quantitative characteristics: their size and their age (see Table 1) and computed additional models with these two variables instead of the variable "garden". The selection model was stepwise, based on Akaike information criterion (AIC) scores, and a type II-anova determined the significance of the variables in the selected model.

We then explored more thoroughly the answers to the open-ended question Q2bis regarding the perception of the garden with a textual analysis: first, raw data were compiled. Then, they were analyzed with the software IRAMUTEQ (Interface of R for the Multidimensional Analyses of Texts and Questionnaire) (Ratinaud, 2009), whose purpose is to let the essential information contained in a text emerge, through a textual statistical analysis (de Sousa Ibiapina et al., 2016). We used the Reinert method (Kalampaliki, 2003; Reinert, 1990) also known as descending hierarchical classification (DHC) (Nolasco, Rodrigues dos Santos, Pereira dos Santosa, & Müller, 2017), to categorize the residents responses. Following this method, pairs of words and sentences that frequently co-occur are gathered into the same class of discourse, and words that are less frequently associated form distinct classes. By computing Chi-square tests, the software provides a statistical indication of the strength of the association between words and classes (Gilles, Mayer, Courvoisier, & Peytreman-Bridevaux, 2017).

2.4.2. *Participation in the gardens and participants personal information*

We first described people participation and the frequency of participation in the gardens. Then, we explored the determinants for residents' participation (question Q5, do they participate in the garden), according to their environmental concern, experiences of nature, environmental involvement and civic involvement. We tested a potential effect of each of the seven proxies separately, by including each of the corresponding variable (considered as independent) in a generalized linear model with binomial error, together with age, sex, SPC and garden (or their size and age, as earlier) as other independent variables. We then applied a stepwise model selection based on Akaike information criterion (AIC) scores to select the best model, and a type II-anova determined the significance of the variables in the selected model.

3 Results

3.1. Characteristics of interviewed people

The sampled residents were composed of 56% women and 44% men (Table 2). The proportion of men and women did not significantly differ among the gardens (chi-square=13.0, df=8, p=0.11). The mean age of sampled residents was 50 years old, with 35% aged between 20 and 40 years old, 33% aged between 41 and 60 years old and 29% aged over 60 years old (Table 2). The age distribution differed among the gardens (chi-square=28.5, df=16, p=0.02). Almost half of the interviewed people had higher intellectual occupations or were retired, and 22% were employees (Table 2). The respective proportions of professional categories differed between the gardens (chi-square=132, df=72, $p < 10^{-3}$).

Table 2 Summarized characteristics of interviewed people (n=431)

	Number	%
Sex		
Female	190	44.1
Male	241	55.9
Age		
Under 20	1	0.2
20-40	151	35
41-60	144	33.4
Over 60	126	29.2
No answer	9	2.1
Socio-professional category (SPC)		
High intellectual occupations	109	25.3
Retired	101	23.4
Employees	93	21.6
Intermediate profession	30	7.0
Artisans, traders and managers	28	6.5
Students	28	6.5
Unemployed	15	3.5
Workers	10	2.3
Without professional activity	8	1.9
No answer	8	1.9
Farmers	1	0.2

3.2 Residents' familiarity with the CG

The majority of respondents (63%, n=273) were not aware of the activities going on in the garden present in their neighborhood. The proportion did not statistically differ between men and women ($p=0.66$). However, it significantly differed according to the socio-professional category and the age of respondents ($p=0.016$ and $p=0.018$ respectively). Among the three most represented SPC in our sample, people with high intellectual occupations were aware of the activities in higher proportion than employees and retired people (59%, 65% and 68% people were not aware of the activities in these three groups, respectively). The respondents who knew about the activities in the garden were significantly older (mean=51 years old) than those who did not know (mean= 48 years old). These proportions also significantly differed between gardens ($p<10^{-3}$, figure 1). The

familiarity of interviewed people did not depend on the age of the gardens ($p=0.14$). However, the proportion of interviewed people who knew about the activities of the garden significantly increased with the size of the garden ($p=0.03$), even if the variables “size” and “age” explained less variability than the general variable “garden” ($AIC=551$ and $AIC=536$ respectively).

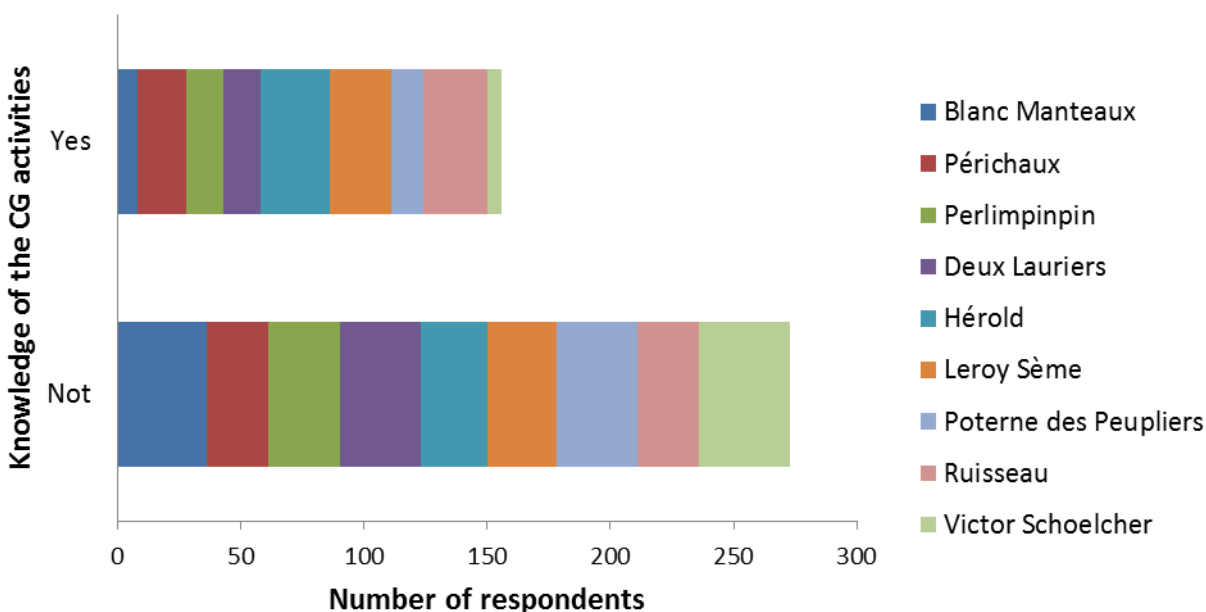


Figure 1. Responses to the question Q1 “Do you know about the activities going on in the garden?”

3.3 Residents’ perceptions of the CG

The majority of respondents (75%, $n=322$) declared that the garden makes people want to enter. This proportion differed neither between men and women ($p=0.75$), nor among the SPC ($p=0.11$). However, it increased with the age of the respondents ($p=0.02$), and differed significantly among gardens ($p<10^{-10}$). The size of the garden had no influence on the willingness of people to enter the garden ($p=0.75$), whereas older gardens were more attractive to people ($p=0.05$). It has to be noted that, as previously, the variables “size” and “age” did not explain all the variability of this response variable, compared to the variable “garden” ($AIC=420$ and $AIC=355$ respectively).

Most respondents (78%, $n=337$) found the garden beautiful. This proportion did not differ between men and women ($p=0.40$), but differed among SPC ($p=0.0004$). Among the three most represented SPC in our sample, people with high intellectual occupations found the garden beautiful in higher proportion than retired people and employees (85%, 83% and 71% respectively). In addition, older people were significantly more prone to find the garden beautiful ($p=0.04$). This proportion significantly differed also among gardens ($p<10^{-10}$). The less attractive garden was Victor Schoelcher, which is located on a roundabout and hosts illegal settlements of vagrants, gypsies, refugees or drug addicts. The most attractive garden was Blanc Manteaux, which is very controlled, disciplined, symmetric, mostly planted with ornamentals and almost totally devoid of weeds (e.g. so called French gardens see Ehrard, 2013). When describing the gardens with their size and age, we did not find any effect of the size of the gardens in the perception of the beauty of the garden ($p=0.73$), whereas older gardens were found significantly more beautiful ($p=0.008$). Note that, as previously, the variables “size” and “age” did not explain all the variability of this response variable, compared to the variable “garden” (AIC=369 and AIC=313 respectively).

The vast majority of respondents (97%, $n=417$) considered the garden present in their neighborhood as something good. All negative answers (14 respondents, 3%) came from two gardens, Poterne de Peupliers ($n=3$) and Victor Schoelcher ($n=11$). In Poterne des Peupliers, people who considered the garden as something bad argued that it did not provide good conditions to gardening (it is located next to a large avenue with a dense traffic that generates pollution around the garden), or that it was private. In Victor Schoelcher, most residents who considered the garden bad argued that it was inconveniently located (within a roundabout) and complained about the illegal settlements in the garden. These settlements imply for these respondents a lack of hygiene

and make the garden unsafe or dangerous (on the opposite, one respondent considered the garden as a bad thing precisely because it was created to drive out the people already settled in there).

Note that even if most interviewed considered the garden as a good initiative, some of them (13) highlighted some negative points. For instance, in the garden Perichaux, two respondents remembered that the garden has been settled in a vacant land where young people used to play basketball, and that it had generated some social tensions; one person highlighted that the small size of the garden restrained the number of volunteer, leading to frustrations. In the gardens Ruisseau, Leroy Sème Poterne des Peupliers and Deux Lauriers, ten respondents regretted that the garden was not open to public because of the fences.

We computed a text analysis of the declared reasons of the positive perceptions (see methods). Regarding these positive perceptions, three main discourse classes emerged. The first main class (35.4% of words) included discourses referring to the importance of increasing the number of green spaces in cities, mostly for social reasons; the second class of discourses (33.2% of words) referred to social relationships, stressing the role of gardens in allowing meetings or contact with people; the third class of discourses (31.4%) referred to the educational role of gardens, mainly for children. The two latter classes were more often associated. In addition, the first class was still often mentioned in relation to both social relationships and the educational role of gardens (Figure 2). The very low proportion of negative responses in the perception of the gardens (3%) did not allow to perform statistical analyses.

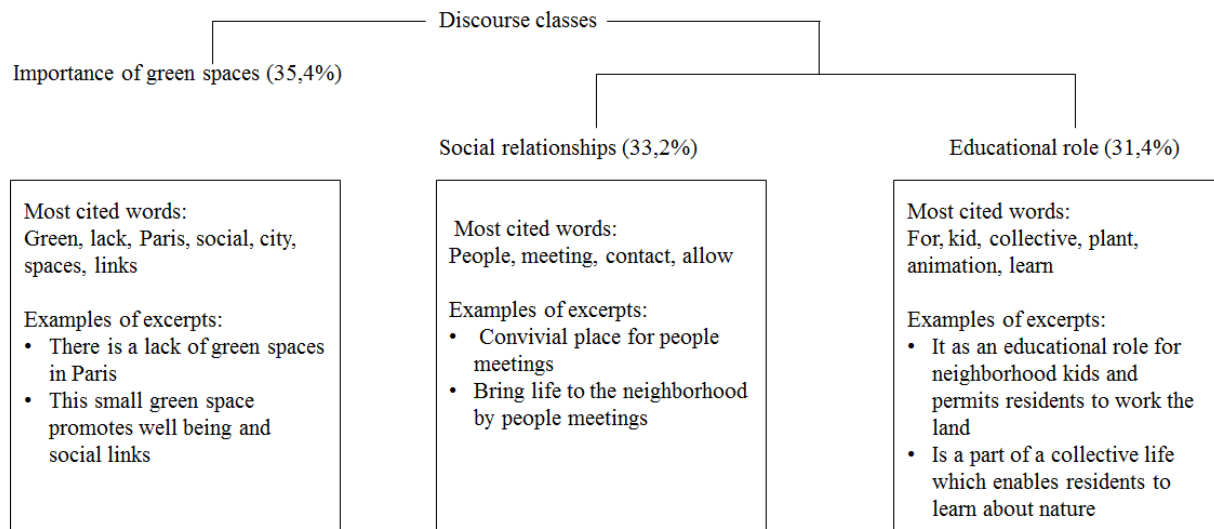


Figure2 Main classes resulting from the DHC analysis of the corpus, with the most cited and significant words (<0.0001) per class. We provide examples of excerpts per class.

3.4 Participation in CG gardens

Eighty percent (n=345) of the residents did not participate in the gardens. However, regarding the 20% (n=86) of respondents who participate in the CG of their neighborhood, participation was quite frequent (mostly several days a week or once a week, Figure 3).

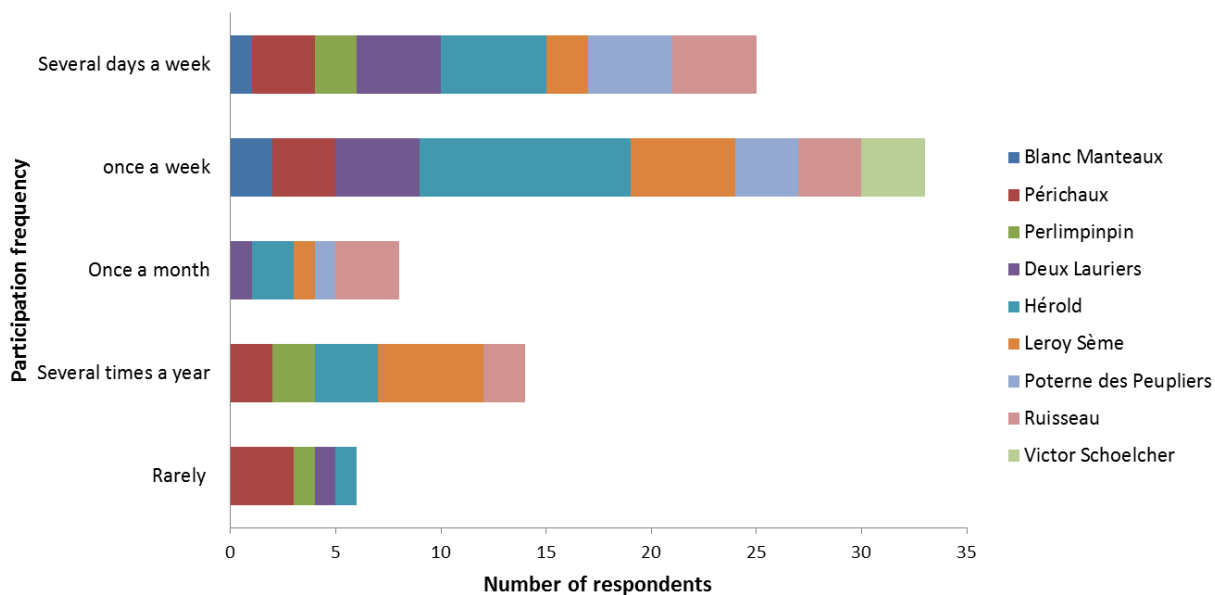


Figure 3. Respondents answers about their participation in the CG present in their neighborhood

We found significant differences in the participation depending on socio-professional categories, and among the gardens. Among the three SPC with the highest number of people in our sample, the highest level of participation was from people with high intellectual profession (26%), followed by retired people (18%) and employees (15%).

All of these effects being taken into account, we still found the following results.

First, respondents who declared being involved in the gardens were significantly more concerned about biodiversity than the others ($p=0.007$). They also had more frequently spent their childhood in a rural place than the others ($p=0.01$), and they tended to refer to best souvenirs taking place in rural places ($p=0.09$, marginally significant).

Secondly, respondents who declared getting involved in the gardens appeared to be significantly more environmentally involved than the others: they declared more often that they consider biodiversity-related issues when voting ($p=0.004$); and they agreed to say that biodiversity protection is everyone's concern ($p=0.005$).

Finally, respondents who declared being involved in the gardens appeared to have also a higher level of civic involvement: they declared to both participate more often to neighborhood councils ($p=0.004$), and be involved in associations (chi square= 44.5, $df=1$, $p<^{10}$).

For all the tests, we found no significant effect of age or of sex of the respondents.

4 Discussion

Our results add some key features to understand how urban greening initiatives are appreciated and incorporated in citizens' everyday life. We discuss our findings following the three research question below.

4.1 Familiarity of the CG

Less than half of interviewed people declared that they were aware of the activities going on in the garden they were living or passing nearby, which can be considered as quite few. The significant effects of socio-professional category and age reflect the importance of individual own interests and histories in their interest toward gardens. However, the knowledge of the activities going on in the gardens also differed strongly among gardens, and these differences were partly explained by the garden size. The visibility of the garden which depends directly upon its size plays therefore surely a role in the fact that it is noticeable or not in the neighborhood. More generally, increasing initiatives regarding the advertisement of the gardens and about what is going on in the garden could further increase the visibility and attractiveness of these gardens in their neighborhood.

4.2 Garden's perceptions

In contrast with the relatively low awareness about the CG in their neighborhood, three quarters of the interviewed people had nevertheless a good perception of the CG, considering that the garden makes one want to enter, and finding the garden beautiful. We also found individual differences in the perception of the garden, according to age and SPC. The perception of the garden is therefore linked to personal histories. We also found that respondents' perceptions differed among gardens, and that perceptions of the gardens were increasingly positive with the age of the gardens, but not with their size. In a parallel study in the same gardens, we showed that older gardens (but not larger ones) home more spontaneous plant species (Torres et al, submitted). These results altogether suggest that older gardens may become attractive to people living in the neighborhood based on the diversity of plants present in there. Paradoxically, the garden per-

ceived as the most beautiful was the one with the most conventional gardening practices. Speake et al. (2013) found comparable results in a study of students' perceptions of the university green spaces in Liverpool, where formal, manicured gardens and lawns were much preferred over more naturalistic areas.

However, the perception of the gardens does not depend exclusively on ecological or aesthetic features. Our results also showed that the few negative perceptions of the gardens also depended on non-natural specific features, such as the presence of fences or the lack of information signs. These external features appear to be read as a sort of privatization of a public place, which becomes dedicated to a specific group, excluding the others.

Other negative perceptions are due to the social context of the garden. For instance, the garden in which the lowest number of people wants to enter, and which presents the most negative perceptions, combines two specificities: first, it is located on a roundabout, which makes people unable to distinguish it as a garden. Second, by hosting homeless people, it highlights social issues that go beyond gardening management [Note that these issues are dealt with by local authorities, who recently created in this neighborhood the first drugs shoot room in Paris (Béguin, 2016) and the first humanitarian center for refugees (Couvelaire, 2016)]. Other negative perceptions of the gardens are linked to the history of the creation of the garden, in a very dense urban context where every single square meter is important. In such a context, assigning to a vacant place specific recreational activities dedicated to a specific public inevitably generates tensions (e.g. Dooling, 2009; Staeheli, Mitchell, & Gibson, 2002).

Yet, the vast majority of the respondents (97%) considered community gardens as a good initiative, and provided explanations based on the importance of green spaces in cities for social rela-

tionships and educational purposes. Previous studies focusing on gardeners already showed the central role of CGs both in environmental education (e.g. in Berlin: Bendt et al. 2013; in Paris: Torres et al. 2017) and social relationships (Torres et al. 2017). These studies support the one of Barthel et al. (2010) in allotments in Stockholm, which highlighted the importance of collective gardens to maintain social relationships in cities.

Our study hence strengthens the collective knowledge on the importance of collective gardens, not only for gardeners but also for citizens in general. Besides, both “social relationships” and “educational roles” are considered as cultural ecosystem services, according to Plieninger, Dijks, Oteros-Rozas, & Bieling (2013). Similarly, we found a clear overlap between these two categories of cultural ecosystem services, indicating the interlinked and holistic nature of cultural ecosystems services (Bieling & Plieninger, 2012; Daniel et al., 2012).

4.3 Participation in the CG

Although most interviewed people did not participate in the gardens, the 20% of interviewed people who indicated that they participated in the gardens were doing so frequently. We could not find any comparable study in the literature, but, if generalized to the total population in the neighborhood of each garden, the number of declared participants is actually quite high, considering the small size of the studied gardens (on average 10 declared participants per garden). This could be explained by the likely very wide spectrum of what people declared as “participation”, ranging from subscription or visits during annual open days, to actual gardening. Yet, independently from the real level of participation, the fact that 20% of the interviewed people declared that they participate in the gardens is highly meaningful in terms of social opening and importance of the community gardens in the whole city.

In more details, we observed significant differences between people that declared participating and the others. First, people with higher intellectual occupations declared more than the average that they participate, and employees less than the average. In the literature concerning participation in environmental actions and SPC, there are contrasted results. There are evidences that environmentalists are generally reported to be middle or upper middle class citizens (Howard, Delgado, Miller, & Gubbins, 1993), but in other contexts low-income earners may display a higher level of environmental concern than high-income earners (Uyeki & Holland, 2000). To our knowledge, our study is the first to address the issue of the impact of socio-professional category on CG participation, and more research is needed to understand our result more thoroughly.

Besides, we showed that people participating in a community garden are significantly more concerned about biodiversity than the others; they had significantly more often than the others experienced nature during childhood, and they had slightly more nature-related souvenirs than others. In addition, they declared higher involvement in environmental issues, declaring for instance more often than they consider biodiversity issues in their election choices. Altogether, our results strongly suggest that participation to community gardens is correlated with a high pro-environmental attitude, which combines current events with notably “urban rural residence, religion, politics, values, personality, experience, education and environmental knowledge” (Gifford & Sussman 2012: 65).

Finally, people that declared participation in a community garden also declared more often than the others their involvement in civic issues. This result regarding multiple involvements is consistent with previous studies. For instance, Westphal (2003) showed that people involved in a civic greening activity (urban community forestry in the United States) were generally involved in multiple forms of communal activities and community actions. As Ion (1999) showed, it is

increasingly likely that people engagements are “à la carte” or “free” that is to say people engage simultaneously in various actions that can be punctual (e.g., sign a petition or subscribe to a NGO) or imply active involvement. Furthermore, Campbell et al. (2016) showed that individual environmental and civic engagements are facilitated by the use of urban parks together with interactions with other people, since it produces vital social meanings and cultural ecosystem services.

5. Limits of the study

Our study suffered from some limitations, mostly due to the design of a face-to-face questionnaire survey close an existing infrastructure, the community garden. First, all our measures of environmental attitudes and practices were based on self-reports. Given that individuals tend to see environmental concern as socially desirable (Bord, Fisher, & O'Connor, 1998), participants may have provided responses that are biased toward appearing more concerned than they actually are (Gifford & Sussman, 2012). The same bias could have occurred in the question concerning the appreciation of the garden. Second, we only asked what people think about the particular garden we were close to, without giving them any opportunity to compare this infrastructure with another one (e.g. parking lot, park, sport area). Other results could have emerged if we had asked people to rank the importance they give to different types of infrastructures.

Another limit lies in the absence of definition of participation. Indeed, participation can be considered as a process, when individuals take an active role in making decisions (Reed, 2008), or it can be more passive (e.g. when paying membership fees, (Torgler, García-Valiñas, & Macynntyre, 2010). However, as we already discussed, the simple fact that individuals self-reported participa-

tion adds particularly interesting understandings on the potential roles a community garden can have in environmental involvement in its neighborhood.

In addition, such a survey does not allow any pre-post survey; we cannot know for instance if participants' environmental commitment happened before or after people participation in CG. Finally, we questioned only French speaking people, which limits our results to this community.

6. Conclusion: perspectives for urban green spaces policies and management

This study was conducted in the specific context of small community gardens implemented in a very dense metropolis (Paris, France), in a western country. In this context, our results can help provide some perspectives.

In urban planning and governance in France, green infrastructures are still often considered as competing for space with housing (Fabre, Prévot, & Semal, 2016). Yet, urban greening projects and citizen civic ecology practices are increasing in big metropolises, even in Paris. Regarding CGs, our results suggest that they are not very well known, and that they attract far less than the majority of residents, mostly people that are also widely engaged in environmental and civic efforts. However, we showed that the vast majority of these residents do appreciate CGs even if they are not familiar with these places. The combination of these results is particularly important, because it shows that these civic ecological practices are indeed locally appreciated, notably because city dwellers living in their neighborhood are aware of the benefits CGs can provide to them, to their neighbors and to the improvement of the city.

Previous studies consistently showed that urban green spaces allow people to experience nature (Torres et al., 2017; Colléony et al., 2017; Miller & Hobbs, 2002; Yli-Pelkonen & Niemelä, 2005), improve health (Soga, Gaston, & Yamaura, 2017; Tzoulas et al., 2007), permit social-

ecological interactions (Torres et al. 2017; Barthel, Folke, & Colding, 2010; Sullivan, Kuo, & Depooter, 2004), and provide a place of recreation which confer well-being (Muratet et al., 2015) and restoration opportunities (Chiesura, 2004). With this study, we show that urban green spaces benefit not only the people practicing in the gardens, but city dwellers in general. Urban planning policies should therefore keep encouraging greening programs, to provide opportunities for urban citizens to experience nature directly or through others, which in turn could entail the development of feelings towards nature and develop environmental stewardship. Because of the little free space available in cities, as Chiesura (2004) stated, it is particularly important for people satisfaction and positive perception of their living environment to manage green spaces in a diversified way to fulfill the needs and expectations of all the segments of the population.

Literature cited

- APUR. (2004). Développer le végétal à Paris. Les nouvelles règles du Plan local d'urbanisme de Paris.
- APUR. (n.d.). II Retour sur l'état des lieux du patrimoine naturel et sur les services rendus par la nature. Retrieved from <http://www.apur.org/sites/default/files/documents/APAPU241b.pdf>
- Barthel, S., Folke, C., & Colding, J. (2010). Social–ecological memory in urban gardens—Retaining the capacity for management of ecosystem services. *Global Environmental Change*, 20(2), 255–265. <https://doi.org/10.1016/j.gloenvcha.2010.01.001>
- Baudelet, L., Basset, F., & Le Roy, A. (2008). *Jardins partagés : Utopie, écologie, conseils pratiques*. Mens: Terre Vivante Editions.

- Baudry, S., Scapino, J., & Rémy, E. (2014). L'espace public à l'épreuve des jardins collectifs à New York et Paris. *Géocarrefour*, 89(1–2), 41–51. <https://doi.org/10.4000/geocarrefour.9388>
- Béguin, F. (2016). Toxicomanie: la première “salle de shoot” ouvre à Paris. *Le Monde*. Retrieved from http://www.lemonde.fr/addictions/article/2016/10/11/toxicomanie-les-salles-d-injection-supervisee-ont-globalement-toutes-un-bilan-positif_5011483_1655173.html
- Bendt, P., Barthel, S., & Colding, J. (2013). Civic greening and environmental learning in public-access community gardens in Berlin. *Landscape and Urban Planning*, 109(1), 18–30. <https://doi.org/10.1016/j.landurbplan.2012.10.003>
- Bieling, C., & Plieninger, T. (2012). Recording manifestations of cultural ecosystem services in the landscape.
- Bord, R. J., Fisher, A., & O'Connor, R. E. (1998). Public perceptions of global warming: United States and international perspectives. *Climate Research*, 11, 75–84.
- Boudeau-Lepage, L. (2017). Ville et nature, vers une nouvelle alliance? In *Ruralité, nature et environnement. Entre savoirs et imaginaires*. (eres, pp. 359–374). France.
- Brown, K. H., & Jameton, A. L. (2000). Public Health Implications of Urban Agriculture. *Journal of Public Health Policy*, 21(1), 20. <https://doi.org/10.2307/3343472>
- Campbell, L. K., Svendsen, E. S., Sonti, N. F., & Johnson, M. L. (2016). A social assessment of urban parkland: Analyzing park use and meaning to inform management and resilience planning. *Environmental Science & Policy*, 62, 34–44. <https://doi.org/10.1016/j.envsci.2016.01.014>
- Chiesura, A. (2004). The role of urban parks for the sustainable city. *Landscape and Urban Planning*, 68(1), 129–138. <https://doi.org/10.1016/j.landurbplan.2003.08.003>

- Clayton, S., Colléony, A., Conversy, P., Maclouf, E., Martin, L., Torres, A.-C., ... Prévot, A.-C. (2017). Transformation of Experience: Toward a New Relationship with Nature: New experiences of nature. *Conservation Letters*. <https://doi.org/10.1111/conl.12337>
- Colléony, A., Prévot, A.-C., Saint Jalme, M., & Clayton, S. (2017). What kind of landscape management can counteract the extinction of experience? *Landscape and Urban Planning*, 159, 23–31. <https://doi.org/10.1016/j.landurbplan.2016.11.010>
- Couvellaire, L. (2016). Le centre pour migrants ouvre ses portes à Paris. *Le Monde*. Retrieved from http://www.lemonde.fr/immigration-et-diversite/article/2016/11/10/le-centre-pour-migrants-ouvre-ses-portes-a-paris_5028547_1654200.html
- Daniel, T. C., Muhar, A., Arnberger, A., Aznar, O., Boyd, J. W., Chan, K. M. A., ... von der Dunk, A. (2012). Contributions of cultural services to the ecosystem services agenda. *Proceedings of the National Academy of Sciences*, 109(23), 8812–8819. <https://doi.org/10.1073/pnas.1114773109>
- de Sousa Ibiapina, A. R., Ferreira de Souza Monteiro, C., Astrês Fernandes, M., Germane Alves Pinto, A., Ibiapina Costa Filho, A. A., de Carvalho Alencar, D., & Martins de Sousa, D. (2016). Therapeutic workshops as spaces of interaction and psychosocial rehabilitation: analysis from basic lexicography. *International Archives of Medicine*. <https://doi.org/10.3823/2257>
- Dooling, S. (2009). Ecological Gentrification: A Research Agenda Exploring Justice in the City. *International Journal of Urban and Regional Research*, 33(3), 621–639. <https://doi.org/10.1111/j.1468-2427.2009.00860.x>
- Ehrard, J. (2013). Nature et jardins dans la pensée française du 18^e siècle. *Dix-huitième siècle*, 45(1), 365. <https://doi.org/10.3917/dhs.045.0365>

- Fabre, P., Prévot, A.-C., & Semal, L. (2016). Le Grand Paris, ville durable ? Limites pour la biodiversité urbaine dans un projet de métropolisation emblématique. *Développement durable et territoires*, (Vol. 7, n°1). <https://doi.org/10.4000/developpementdurable.11131>
- Gallaher, C. M., Kerr, J. M., Njenga, M., Karanja, N. K., & WinklerPrins, A. M. G. A. (2013). Urban agriculture, social capital, and food security in the Kibera slums of Nairobi, Kenya. *Agriculture and Human Values*, 30(3), 389–404. <https://doi.org/10.1007/s10460-013-9425-y>
- Gifford, R., & Sussman, R. (2012). Environmental attitudes. In *The Oxford Handbook of Environmental and Conservation Psychology* (Oxford University Press, pp. 65–80). Susan D. Clayton.
- Gilles, I., Mayer, M., Courvoisier, N., & Peytremann-Bridevaux, I. (2017). Joint analyses of open comments and quantitative data: Added value in a job satisfaction survey of hospital professionals. *PLOS ONE*, 12(3), e0173950. <https://doi.org/10.1371/journal.pone.0173950>
- Guitart, D., Pickering, C., & Byrne, J. (2012). Past results and future directions in urban community gardens research. *Urban Forestry & Urban Greening*, 11(4), 364–373. <https://doi.org/10.1016/j.ufug.2012.06.007>
- Hinds, J., & Sparks, P. (2008). Engaging with the natural environment: The role of affective connection and identity. *Journal of Environmental Psychology*, 28(2), 109–120. <https://doi.org/10.1016/j.jenvp.2007.11.001>
- Howard, G. S., Delgado, E., Miller, D., & Gubbins, S. (1993). Transforming Values into Actions: Ecological Preservation through Energy Conservation. *The Counseling Psychologist*, 21(4), 582–596. <https://doi.org/10.1177/0011000093214004>

- INSEE. (2013). Recensement de la population. Retrieved from <http://www.insee.fr/fr/ppp/bases-de-donnees/recensement/populations-legales/france-regions.asp?annee=2013>
- INSEE. (2014). Comparateur de territoires. Département de Paris (75). Retrieved from <https://www.insee.fr/fr/statistiques/1405599?geo=DEP-75>
- Ion, J. (1999). Injonction à participation et engagement associatif. *Hommes et Migrations*, 1217(La ville désintégrée), 80–94.
- Kalampaliki, N. (2003). Contribution of the ALCESTE method in the study of social representations. In *Méthodes d'étude des représentations sociales* (Erès, pp. 147–163). Abric, C.
- Karanth, K. K., Kramer, R. A., Qian, S. S., & Christensen, N. L. (2008). Examining conservation attitudes, perspectives, and challenges in India. *Biological Conservation*, 141(9), 2357–2367. <https://doi.org/10.1016/j.biocon.2008.06.027>
- Larrère, C., & Larrère, R. (2015). Chapitre 2 De la nature à la biodiversité: desserrer l'étoupe du dualisme. In *Penser et agir avec la nature. Une enquête philosophique* (La découverte). Paris.
- Lawrence, A. (2009). The first cuckoo in winter: Phenology, recording, credibility and meaning in Britain. *Global Environmental Change*, 19(2), 173–179. <https://doi.org/10.1016/j.gloenvcha.2009.01.006>
- Mairie de Paris. (2012). La Charte Main Verte des Jardins Partagés de Paris. Retrieved from <http://api-site-cdn.paris.fr/images/123236.pdf>
- Mairie de Paris. (2016). 2016 DU 1 PLU-Evaluation du plan local d'urbanisme, approbation de la modification générale. Retrieved from <https://api-site-cdn.paris.fr/images/83060>
- Mairie de Paris. (2016a). Jardins partagés parisiens. Retrieved from <https://api-site-cdn.paris.fr/images/93671>

- Mairie de Paris. (2017). Plan Local d'Urbanisme. Retrieved from https://www.paris.fr/services-et-infos-pratiques/urbanisme-et-architecture/les-regles-d-urbanisme-mode-d-emploi/le-plan-local-d-urbanisme-plu-2329#consulter-telecharger-le-plu-applicable_2
- Mathevet, R., & Godet, L. (Eds.). (2015). *Pour une géographie de la conservation: biodiversités, natures et sociétés*. Paris: L'Harmattan.
- Matsuoka, R. H., & Kaplan, R. (2008). People needs in the urban landscape: Analysis of Landscape And Urban Planning contributions. *Landscape and Urban Planning*, 84(1), 7–19. <https://doi.org/10.1016/j.landurbplan.2007.09.009>
- McCormack, G. R., Rock, M., Toohey, A. M., & Hignell, D. (2010). Characteristics of urban parks associated with park use and physical activity: A review of qualitative research. *Health & Place*, 16(4), 712–726. <https://doi.org/10.1016/j.healthplace.2010.03.003>
- Miller, J. R., & Hobbs, R. J. (2002). Conservation Where People Live and Work. *Conservation Biology*, 16(2), 330–337. <https://doi.org/10.1046/j.1523-1739.2002.00420.x>
- Muratet, A., Pellegrini, P., Dufour, A.-B., Arrif, T., & Chiron, F. (2015). Perception and knowledge of plant diversity among urban park users. *Landscape and Urban Planning*, 137, 95–106. <https://doi.org/10.1016/j.landurbplan.2015.01.003>
- Nolasco, M. M., Rodrigues dos Santos, A. P., Pereira dos Santosa, N., & Müller, L. (2017). Use of the Software IRAMUTEQ in Qualitative Research: An Experience Report. In *Computer Supported Qualitative Research* (Springer). Switzerland.
- Pinçon, M., & Pinçon-Charlot, M. (2014). *Sociologie de Paris* (La Découverte). Paris.
- Plieninger, T., Dijks, S., Oteros-Rozas, E., & Bieling, C. (2013). Assessing, mapping, and quantifying cultural ecosystem services at community level. *Land Use Policy*, 33, 118–129. <https://doi.org/10.1016/j.landusepol.2012.12.013>

- Prévot, A.-C., Clayton, S., & Mathevet, R. (2016). The relationship of childhood upbringing and university degree program to environmental identity: experience in nature matters. *Environmental Education Research*, 1–17. <https://doi.org/10.1080/13504622.2016.1249456>
- R Core Team. (2013). *R: A language and Environment for Statistical Computing* (R Foundation for Statistical Computing). Vienna, Austria.
- Ratinaud, P. (2009). IRAMUTEQ: Interface de R pour les analyses multidimensionnelles de textes et de questionnaires. Retrieved from <http://www.iramuteq.org/>
- Reed, M. S. (2008). Stakeholder participation for environmental management: A literature review. *Biological Conservation*, 141(10), 2417–2431. <https://doi.org/10.1016/j.biocon.2008.07.014>
- Reinert, M. (1990). ALCESTE: a methodology for textual data analysis and an application: Aurelia De Gerard De Nerval. *Bulletin of Sociological Methodology*, 26, 24–54.
- Shwartz, A., Turbé, A., Simon, L., & Julliard, R. (2014). Enhancing urban biodiversity and its influence on city-dwellers: An experiment. *Biological Conservation*, 171, 82–90. <https://doi.org/10.1016/j.biocon.2014.01.009>
- Sakurai, R., Kobori, H., Nakamura, M., & Kikuchi, T. (2015). Factors influencing public participation in conservation activities in urban areas: A case study in Yokohama, Japan. *Biological Conservation*, 184, 424–430. <https://doi.org/10.1016/j.biocon.2015.02.012>
- Soga, M., & Gaston, K. (2016). Extinction of experience: the loss of human-nature interactions. *Frontiers in Ecology and the Environment*, 14(2), 94–101.
- Soga, M., Gaston, K. J., & Yamaura, Y. (2017). Gardening is beneficial for health: A meta-analysis. *Preventive Medicine Reports*, 5, 92–99. <https://doi.org/10.1016/j.pmedr.2016.11.007>

- Speake, J., Edmondson, S., & Nawaz, H. (2013). Everyday encounters with nature: students' perceptions and use of university campus green spaces. *HUMAN GEOGRAPHIES – Journal of Studies and Research in Human Geography*, 7(1), 21–31.
<https://doi.org/10.5719/hgeo.2013.71.21>
- Staeheli, L. A., Mitchell, D., & Gibson, K. (2002). Conflicting rights to the city in New York's community gardens. *GeoJournal*, 58(2/3), 197–205.
<https://doi.org/10.1023/B:GEJO.0000010839.59734.01>
- Stedman, R. C. (2002). Toward a Social Psychology of Place. Predicting Behavior from Place-Based Cognitions, Attitude, and Identity. *Environment and Behavior*, 34(5), 561–581.
- Sullivan, W. C., Kuo, F. E., & Depooter, S. F. (2004). The Fruit of Urban Nature: Vital Neighborhood Spaces. *Environment and Behavior*, 36(5), 678–700.
<https://doi.org/10.1177/0193841X04264945>
- Tidball, K. G., & Krasny, M. E. (2007). Chapter 7 From risk to resilience: what role for community greening and civic ecology in cities? In *Social learning: Toward a Sustainable World* (Wageningen Academic Publishers, pp. 149–164). Arjen Wals.
- Tidball, K., & Krasny, M. (2014). Greening in the Red Zone. Disaster, Resilience and Community Greening. In *Greening in the red zone. Disaster, resilience and community greening* (Springer). New York.
- Torgler, B., García-Valiñas, M. A., & Macynntyre, A. (2010). 3 Participation in environmental organizations. What matters? (Routledge, pp. 56–92). New York.
- Torres, A., Nadot, S., Prévot, A.-C. (2017). Specificities of French community gardens as environmental stewardships. *Ecology and Society*, 22(3):28.

- Torres, A. C., Prévot, A.-C., Nadot, S., Zheng, C., Martin, G., & Vergnes, A. Habitat heterogeneity in community gardens promotes spontaneous plants richness. *Manuscript Submitted for Publication*.
- Tzoulas, K., Korpela, K., Venn, S., Yli-Pelkonen, V., Kaźmierczak, A., Niemela, J., & James, P. (2007). Promoting ecosystem and human health in urban areas using Green Infrastructure: A literature review. *Landscape and Urban Planning*, 81(3), 167–178. <https://doi.org/10.1016/j.landurbplan.2007.02.001>
- UNEP. (2016). Ville en vert, ville en vie: un nouveau modèle de société. Retrieved from <http://www.lesentreprisesdupaysage.fr/dossier-de-presse/#page=1>
- UNEP-IPSOS. (2013). Jardins et espaces verts, l'exception culturelle française? Retrieved from http://www.gre-mag.fr/site/wp-content/uploads/2014/12/dp_unep_ipsos_2013.pdf
- Uyeki, E. S., & Holland, L. J. (2000). Diffusion of Pro-Environment Attitudes? *American Behavioral Scientist*, 43(4), 646–662. <https://doi.org/10.1177/00027640021955478>
- Wells, N. M., & Lekies, K. S. (2006). Nature and the life course: Pathways from childhood nature experiences to adult environmentalism children, 16(1), 1–24.
- Westphal, L. (2003). Urban greening and social benefits: A study of empowerment outcomes. *Journal of Arboriculture*, 29(3), 137–147.
- Winter, S. J., Esler, K. J., & Kidd, M. (2005). An index to measure the conservation attitudes of landowners towards Overberg Coastal Renosterveld, a critically endangered vegetation type in the Cape Floral Kingdom, South Africa. *Biological Conservation*, 126(3), 383–394. <https://doi.org/10.1016/j.biocon.2005.06.015>

- Wolch, J. R., Byrne, J., & Newell, J. P. (2014). Urban green space, public health, and environmental justice: The challenge of making cities “just green enough.” *Landscape and Urban Planning*, 125, 234–244. <https://doi.org/10.1016/j.landurbplan.2014.01.017>
- Yli-Pelkonen, V., & Niemelä, J. (2005). Linking ecological and social systems in cities: urban planning in Finland as a case. *Biodiversity and Conservation*, 14(8), 1947–1967. <https://doi.org/10.1007/s10531-004-2124-7>
- Zhang, Y., Van den Berg, A., Van Dijk, T., & Weitkamp, G. (2017). Quality over Quantity: Contribution of Urban Green Space to Neighborhood Satisfaction. *International Journal of Environmental Research and Public Health*, 14(5), 535. <https://doi.org/10.3390/ijerph14050535>.

Chapitre 5

Urban social-ecological conflict. Challenging reflections to nature conservation and urban planning

(In review)

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Abstract

Environmental stewardship initiatives have been highlighted as having a role in nature conservation and as such, they can be considered as partaking in social-ecological processes through shaping the city ecological infrastructure and its capacity to generate ecosystem services. The case of the associative *Pouce Vert* community garden in Le Pré-Saint-Gervais (France) is explored as an outstanding example of environmental stewardship placing in the limelight the members of the garden in the search to improve urban life quality. The establishment of the garden involved shaping, producing and renegotiating continuously social-ecological experiences. It provided an opportunity for citizens to reclaim and revitalize the neighborhood, to manage and influence local landscape planning, to influence the quality of the urban ecosystem, to create social bonds and to create alliances with other social-ecological movements. The members took part in the daily make of the urban framework, by taking responsibility in the construction and liveliness of the neighborhood and more widely of the city. The social-ecological conflict generated by the political decision to close the garden revealed people attachment to this place and the social-ecological relationships taking place in it. This leads gardeners and garden supporters to mobilize to defend the garden. We show how political decisions underestimate these attachments and neglect the complexity of social-ecological process. This study shows how the desire to create a garden as a project to improve living conditions develop relational values which be drivers for political action.

Key words: attachment; civic ecology practice; community garden; environmental stewardship; relational value.

Introduction Urban centers worldwide have undergone a massive erosion of public spaces (Harvey 2006), which has transformed the social and cultural textures of vivid neighborhoods (Hackworth 2007), and has simultaneously affected the possibility to experience nature in public green spaces (Clayton et al. 2017). All these urban transformations have been challenged worldwide through a diversity of citizen collective actions (e.g. community gardens, community forestry, tree planting and care) in cities, implemented to confront social-ecological issues, such as air pollution, noise, heat, scarcity of space for recreation, or the lack of social bonds (Chapin et al. 2010). These so-called civic ecology practices (Krasny and Tidball 2012) or environmental stewardship initiatives (Krasny et al. 2014, Torres et al. 2017) aim to improve urban life-quality through active participation and engagement toward nature, individuals or society (Tidball and Krasny 2007, 2014), participation and engagement being defined as processes that highlight the notion of responsibility to social-ecological systems.

Environmental stewardship initiatives have also been highlighted regarding their roles in nature conservation, because they create and protect green areas (Diani 1992, Ansell 2003). As a consequence, provide habitats for a diversity of wild plant and animal species (Matteson et al. 2008, Matteson and Langellotto 2011,), offer arenas for transforming experiences of nature (Torres et al. 2017), and are ideal sites for environmental education (Tidball and Krasny 2010) or citizen sciences (Krasny et al. 2014). As such, they can be considered as partaking in social-ecological processes through shaping the city ecological infrastructure and its capacity to generate ecosystem services (Ernstson et al. 2008).

Among the variety of environmental stewardship initiatives, community gardens have drawn attention, both because they have taken place in the center of struggles over the right to urban space (Schmelzkopf 2002, Staeheli et al. 2002, Eizenberg 2013) or because they are expected to have beneficial outcomes in terms of neighborhood revitalization, urban sustainability, social capital, biodiversity conservation and environmental education (e.g. Matteson et al. 2008, Tidball and Krasny 2010, Guitart et al. 2012, Drake & Lawson 2014). These multiple and overlapping benefits and outcomes change over time (Saldivar-tanaka and Krasny 2004).

However, independently of their expected benefits, the longevity and permanence of community gardens is generally fragile (Smith and Kurtz 2003, Drake and Lawson 2014). In the United States for example, government agencies and philanthropic groups have historically planned community gardens as temporary projects, which were needed during specific crises (e.g. alimentary, economic), and which could lose supports when the need has ended (Schmelzkopf 2002, Lawson 2005, Moore 2006). As proposed by Drake and Lawson (2014: 164), “gardens are used as a bandage for some underlying problem and are only needed until the problem is resolved”. In France, community gardens are usually implemented in public or private lands that are temporarily vacant, waiting for an assignation or a planned construction (Torres et al. 2017). Hence, these gardens have a temporal status and are at risk to be closed by the local authorities (see for example Jardin des Jeunes Pouces 2017, Pinalie, 2016). However, contrary to the funders or public authorities, people participating in these gardens consider them as meaningful parts of their neighborhoods, with ongoing benefits (Saldivar-tanaka and Krasny 2004, Eizenberg 2013, Hou et al. 2009). These contrasted visions of land use and rights to space in urban areas are sources of conflicts, when urban planning prioritizes economic and housing over community gardens (Schmelzkopf 1995, 2002, Smith and Kurtz 2003, Rosol 2012).

In 2016, the community garden “Le Pouce Vert”, located in Le-Pré-Saint-Gervais (France) has been closed by the municipality, after eight years of existence and at least three years of negotiations to avoid the closure. In this paper, we detail the story of this garden and use it as a case study to explore the implications of two processes: the construction of a community garden, and the development of a social-ecological conflict generated by the political decision to close the garden. Through this example, we explored the underlying motivations of such conflict in a city, and the consequences for nature conservation and urban planning. In particular, we were interested in the dynamics of the relationships created by the construction of the garden, and then destroyed. We used the concept of relational values proposed by Chan et al., (2016), which explains and discuss the interactions with and responsibilities to human, non-humans, landscapes and ecosystems. These values encompass values associated with living a good life (eudaimonic values) as well as reflection about how preferences and societal choices relate to notions of justice, reciprocity, care and virtue (Klain et al. 2017, Ryan and Deci 2001).

We carried on this research through ethnographic methodologies of in-depth interviews, participant observations and file analysis. All the ethnographic survey was done by a single researcher, XXX. Interviews of the gardeners were conducted before and after the conflict related to the garden’s closure. To maintain the confidentiality of the interview, participants are not cited. Participant observations were conducted from December 2013 to September 2016 in the garden, during the demonstrations of gardeners and supporters and during the meetings with the municipality. In addition, we analyzed archives coming from three different sources: the garden itself (newsletters, pamphlets and position papers), the association *Graine de jardins* (which supports the development of community gardens, and acts as a mediator between land owners and the people interested in the creation of gardens whenever needed), and the municipality of *Le-Pré-saint-Gervais*.

Some general information about the garden

With more than 17 000 inhabitants living in a total area covering only 0.7 km² (INSEE 2014), *Le-Pré-Saint-Gervais* is a very dense city in the close surrounding of Paris, France. The community garden “*Le Pouce Vert*” was the first community garden ever implemented in this city; it was created in 2008 after a collective mobilization of city dwellers with the help of the association *Graines de jardin*. An agreement for temporary occupation of the land was signed with the municipality (for three years at the beginning, but subsequently an occupation convention was signed every year); according to this agreement, city dwellers interested in managing the garden formed an association committed to manage the garden ecologically, to cultivate only herbaceous plants and bushes and no trees, and to provide cultural activities and activities related to gardening (Ville du Pré-Saint-Gervais 2013, *Le Pouce Vert* 2014). Thus, gardeners turned a place used to store construction material, with some workers lodges and a part of vacant land into a garden called “*Le Pouce Vert*” covering approximately 800m². The garden was located in the very center of the city, in a much-transited zone between the post office and the city hall. Its name refers both to a French children book (*Tistou et les pouces verts* written by Maurice Druon in 1957) and to the popular expression “avoir les pouces verts”, which means having personal gift to grow plants.

Implications of the construction of the community garden *Le pouce vert*

First, the construction of the garden involved the development of a relationship between the gardeners as a collective and the municipality. This relationship started with the negotiations for the creation of the garden and continued through the exchanges with the technical services of the municipality for equipment provisioning such as soil and fences. Gardeners specifically required

fences that did not exceed a height of 1.30m, to allow exchanges between the exterior and the interior. In what follows we will see that this request is particularly important.

The relations with the municipality continued sporadically over time. For example, the municipality asked the gardeners to conduct workshops for the city (*Le Pouce Vert* association public meeting, December 2015).

Second, the construction of the garden created a relationship between the gardeners and the garden itself that started when they arrived in the place dedicated to the future garden. Gardeners found a place that was completely unsuitable for gardening (see Figure 1), because it was composed of hard soil and debris.



Figure 1. First works developed in the *Pouce vert* community garden © *Pouce Vert* files.

The gardeners collectively coped with these conditions by recycling some of the debris to build various structures: sheds (to store tools, seeds, and gardening equipment), insect hotels (to host insects and to use as pedagogical tools), art decorating structures and convivial spaces. Gardeners also progressively enriched the quality of the soil, which they first had to break piece by piece

with hammers, through composting, adding rich soil, and by plowing the garden. All these steps let emerge a fertile garden, which was eventually organized in different areas, all being managed collectively: an orchard, a flower garden, a place with medicinal plants, a place with off-ground plantations (in a variety of structures such as bins, recycled material, boxes, etc.), a non-managed area with spontaneous plants and structures for compost, as well as a pond holding aquatic plants (Figure 2).



Figure 2. Mosaic of various landscapes and structures within the garden. (a) ornamental plot. (b) Insect hotel (in the background we can observe the fences of the garden that are not high and enable to see the garden). (c) Non-managed area for spontaneous plants. (d) Off-grounded plantation in an old chair, (e) Medicinal plants plot with a blackboard indicating the cultivated plants. We can also observe a big format photo of a butterfly taken in the garden. © Ana-Cristina Torres.

Participation goes beyond collaboration and involves all sorts of relations, including conflicts (Orthner 1984, Bourdieu 2000). The only conflict found among gardeners was related to the different manners in which the gardeners wanted to arrange the space, some of them preferred to

grow only edible plants, while other ones wanted to follow Gilles Clément's approach of gardening that recognizes the ecological richness and the aesthetical potential of spontaneous vegetation (see Clément, 2012). As Barthel et al. (2010:258) found for allotments gardens in Stockholm, "participation refers to a process taking part and sharing and to the relations with others that reflect such practice; hence, it suggests both action and connection and mutual recognition". Thus, this conflict positively triggered different modes of dialogue and negotiation about land use and garden principles. Through these dialogues and negotiations an implicit organization helped each gardener find his/her place. For example, a gardener who loved plants started to grow plants; another one who enjoyed art started to make artistic work; a handyman-gardener started to construct the garden infrastructures. A naturalist gardener also found his place in the garden through the observation of fauna and flora, and as mentioned by several gardeners, he transferred his passion for animals and plants to others, letting emerge a general interest to biodiversity and further a generalized ecological orientation in the garden.

Furthermore, the location of the garden (between the city hall and the post office) and its visibility (it was surrounded by low fences (figure 2b) gave the opportunity to many passers-by to discover the garden and its gardeners. Those who liked the initiative started to participate in the garden. In addition, the gardeners developed the habit of inviting to enter in the garden every individual who looks at the garden through the fences. Hence, the garden welcomed hundreds of members and visitors during its eight years of existence. Every year, about 150 people registered as members of the association. Most of them were not very active, but supported the garden by paying the annual membership, and enjoyed the activities proposed in the garden. In average, a dozen people were very active, spending time managing the association, gardening or implementing activities in the garden. Activities implemented in the garden were public and sought both to attract neighbors to participate in the garden and to promote neighbors' meetings and exchanges.

Two specific activities were particularly successful, the compost program and the Christmas tree recycling program. These two activities were implemented to cover some needs in the garden (soil fertilization and soil coverage), because of their success these activities entail high amounts of waste and Christmas trees to deal with, and demanded a great commitment of gardeners (Figure 3). Thus, the construction of this community garden provided a public place accessible to people at least twice a week and every time a member of the association was in the garden.

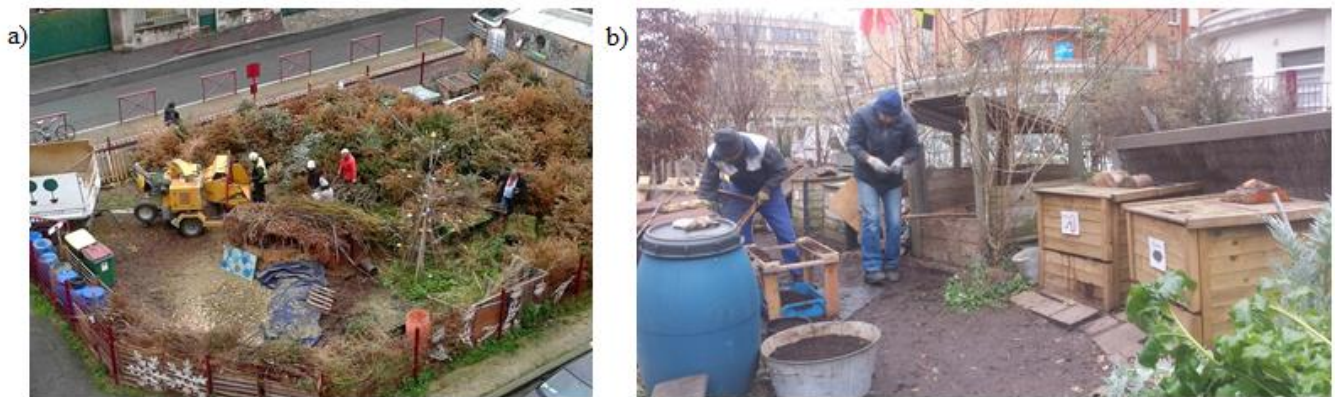


Figure 3. a) Christmas trees' recycling program and b) compost program © *Pouce Vert* files.

Another important implication of this garden was a specific teaching and learning initiative developed by volunteering gardeners in the form of workshops (so-called the «didactic garden»). These workshops were developed for children of a public kindergarten. The relationships between gardeners and the kindergarten were formalized through a signed agreement. In these workshops, the gardeners proposed children to experience nature through their senses (for instance by seeing, touching, feeling and smelling cobwebs, compost, soil or flowers; by cultivating or exploring natural elements in the garden); they also taught children notions on biodiversity and ecological processes with the help of the insect hotels and the compost, and promoted nature experiences through land art (Le Pouce Vert 2015). According to the garden records, the garden received a total of 400 children during the academic year 2014-2015 for these workshops.

Beside the kindergarten, relations were also developed with other types of institutions. For instance, because gardening practices were organic and used ancient varieties of plants, the gardeners bought their seeds from the Kokopelli association (Kokopelli 2016). In turn, Kokopelli subscribed to the garden association. New social network has thus emerged seeking sustainable relations in social-ecological systems. More generally, the general organization of the garden (notably the participatory gardening) and the practices in this community garden, encouraged relations with other associations of community gardens, transition town movements (*sensus* Hopkins 2008), as well as with a diversity of cultural, artistic or environmental associations. Based on specific human-nature relationships, the community garden progressively became a sort of convergence space, comprising a diversity of affinities, and promoting new networks of communication, solidarity, information and mutual support (Routledge 2003).

These new social networks let the garden to further achieve another step in its openness. Indeed, the practices implemented in this small garden became known at larger scale, and groups coming from other French metropolises (e.g. Orléans, Sarcelles) came to visit the garden, to learn how to start or how to manage a community garden. The garden was reported in newspapers and documentaries, and participated in exhibitions on greening initiatives.

The adventure of the construction of this community garden had therefore diverse unexpected and intertwined consequences. As stressed by the gardeners themselves, this initiative enriched and embellished the life in the neighborhood. The gardeners also considered that they encouraged new pro-environmental dynamics (composting, recycling), not only in the neighborhood but also in the whole city. They also highlighted the role of the garden in providing people in difficulty (e.g. unemployed, depressed) a place with social relations, activities and the required peacefulness to face their difficulties. However, we showed that this initiative, quietly and implicitly,

enriched profoundly interpersonal relationships at different scales, from gardeners to groups of stakeholders that share the same world vision and perspectives.

We observe the construction of the *Pouce Vert* community garden as an ongoing process of participation and production of a fabric of relations, through diverse types of activities. Through the creation of this space, members of the association showed a care about social-ecological systems.

Implications of the closure-based conflict

Since at least December 2013 when we started to study this garden, the gardeners regularly expressed their concern about an imminent closure of the garden. They never felt any support from local authorities, and responded to this lack of concern by developing a large diversity of activities (see above) and designs to convince these authorities and the city dwellers as a whole that the garden was important.

The conflict started when the municipality made public the project of redesigning an urban area of 1346m² in total, which included the 800m² garden and the surrounding streets. The project was first presented with the whole surface constructed with new buildings with apartments; further presentations included a 1040m² public garden (greenspace) including a children playground, a resting area and a community garden with animations like those currently implemented by the association *Le Pouce Vert* (Ville du Pré-Saint-Gervais 2013, Ville du Pré Saint Gervais 2014, n.d.-a). The conflict arose because the municipality decided to close the current garden even though the upcoming apartment construction was meant to take place next to its current location, theoretically leaving space for the garden. However, the space occupied by the garden was planned to be devoted to the storage of equipment, tools and machinery needed for the construction. As an offset measure, the municipality offered gardeners either to relocate their garden on ano-

ther vacant land, or to wait for two years while the building was being constructed and restart their gardening activity in the future dedicated place.

During all the four-steps communication process organized by the municipality with city dwellers (Ville du Pré Saint Gervais n.d.-b), the gardeners considered that many aspects of the project remained ambiguous. For instance, the composition of the potential greenspace was never explicitly detailed, even if gardeners wanted to know if there would be “only a lawn, or if the area would include diverse plants and habitats” (Gardener B personal communication, April 2014). Similarly, neither the size of the new potential community garden, nor the expected role of the current association *Pouce vert* in the design and management of this new garden were ever mentioned. This ambiguity did not help gardeners understand the project; some of them first thought that half of the current garden would be saved and that they would be able to keep working in the garden even during the restructuration of the area. But over time, they understood that nothing was sure, and eventually realized that their garden was doomed to disappear.

During all the negotiation phase, the gardeners tried to keep open at least half of the existing community garden, to continue current education and participation programs, and to conserve the biodiversity and the rich soil that they had successfully created in the eight years of the garden’s existence. They expressed their impossibility to compensate all the labor years they used to “create a rich soil” (Gardener A personal communication, April 2014), to “bring life, biodiversity” (Gardeners B, personal communication April 2015) and to construct a dynamic that gather neighbors (Gardener F; personal communication December 2015).

When gardeners were notified about the imminent closure of the garden, expected for March 2016, they did not understand the rationality of destructing an existing garden to rebuild another one two years after. More importantly, they considered this decision as a devaluation, even a negation, of the hard struggle they had deployed during the last eight years. In addition, they consi-

dered that the local authorities did not recognize the complex cycles of life (e.g. “some insects have cycles of 2-3 years”, Gardener D, personal communication, Janvier 2014) or the time needed for biodiversity to settle (e.g. “at least three years to have density and diversity”, Gardener C personal communication, May 2014). Finally, most of the gardeners were retired people and most of them couldn’t imagine being physically and psychologically able to restart a garden from scratch (Gardener G personal communication, December 2015). For all these reasons, the gardeners considered the public decision to close the garden as an offense: “even if we return in two years the garden will no longer exist” (Gardener F personal communication, December 2015). The offset relocation measure was evenly considered as an offense, even with the provision of beehives or henhouses: “something that local authorities cannot understand is that a garden is not only bins with plants that can be stored” (Gardener G personal communication, December 2015).

Struggling for something that we care about

From the gardeners’ point of view, the environmental issues were not considered seriously by the local authorities of their city. They had constructed the garden as a political center (*sensus* Hache 2012) in which they were passing a collectively-constructed message “about the importance of urban green areas for human health and welfare, for biodiversity, for the environment, the world, the climate” (Gardener’s personal communication, June 2014). For them, constructing this political center in the downtown and visible for most city dwellers was particularly important.

During all the duration of the conflict, the gardeners developed a range of tips and tools to enhance the garden importance and to spread their message. For instance, they included the garden in the patrimony day, to highlight its important as natural patrimony. Also, they boosted an engagement from stakeholders in terms of composting and environmental education programs as well

as the sustainable design of the upcoming building (e.g. renewable energies, green roofs) (Ville du Pré Saint Gervais 2013).

Once stated the date of the closure, the gardeners had several meetings, and organized protest actions (Figure 4).



Figure 4. Gardeners manifestations against the gardens closure. © Ana-Cristina Torres.

For instance, they called for street demonstrations inspired in “cacerolazo” (or casserole, a form of protest which consists of a group of people making noise by banging pots or other utensils in order to call attention), they distributed informative flyers and online petitions, they deployed protesting banners, protesting pictures and poems over the garden fences, and they asked city dwellers to write letters to the Mayor explaining why the garden was important and asking the reasons of its closure. All these meetings and events provided opportunities for gardeners to display their creativity in contesting the municipality project. They were also occasions to meet citizens supporting the garden although not actively participating in it. However, these meetings revealed also some tensions among gardeners, and the *Le Pouce Vert* association started to split. Some of the tensions were trivial, when the gardeners did not agree with the forms or the intensity of the protest. But, the main tension was due to a profound divergence of opinion between gardeners: some of the newly arrived gardeners that were not present since the beginning of the gar-

den, did not consider the temporal occupation agreement with the municipality as valid; and conversely, for some gardeners present since the beginning of the garden the fact of not complying with the signed agreement discredited their integrity. It was therefore difficult for the association to reach a collectively supported position against the official project. When the decision to close the garden came as definitive, gardeners started to experience the loss of the garden as a duel (Gardener H personal communication, January 2016).

Reinventing a new garden

At the end of all the negotiation and demonstration period, the final decision was to keep active a part of the current garden covering a surface of 200m² (instead of the 100m² first proposed by the municipality). The exact location of this surface was selected to protect the pond and some of the trees in the garden. In addition, eight plants considered ecologically important were transplanted by the municipality services to other green areas in the city. Although the garden was not completely eradicated, this transformation was painful for most of the gardeners, who could not figure out how their association or the garden could survive in such a small area. The transition period between the closure of the garden *Le Pouce Vert* and the reopening of the preserved area took several weeks and was lived as a period of uncertainty about the future organization and management of the newly circumscribed garden.

Today, the association continues to develop gardening activities. The compost program is still open, but because the garden cannot receive the same amounts of organic waste, new rules have been implemented by the gardeners, with specific opening times and education campaigns. In parallel, the municipality developed a composting program, in which they wish to include the garden's compost spot. The municipality hired an eco-educator that oversees all the educative parts of the program. The program involving the didactic garden with the kindergarten has

stopped, but gardening workshops still take place in the garden. The gardeners keep managing the garden in the opposite way to the traditional “French model” but as an open immersive garden (Gardener I personal communication, June 2016), keeping the identity of the old garden by giving a place to spontaneous nature, recognizing its ecological richness and aesthetical potential. Concerning the restructuration of the area, the gardeners concentrate their actions on being active stakeholders in the plan and design of the future green area.

In 2017, five other community gardens have been opened in the city. Together with the new public compost program, these new gardens are the signs of a new public policy regarding urban nature. This profound and structural change is perceived by most of the gardeners as a triumphal success.

What does this story tell us regarding environmental conservation?

The history of the *Pouce Vert* places in the limelight the members of a community garden in search of urban life-quality improvement through active participation and engagement toward a social-ecological system. Hence, this environmental stewardship initiative shows its capacity to establish or enhance social influences that encourage action.

First, the creation and the eight years duration of the garden included continuously shaping, producing and renegotiating social-ecological experiences. The building of the garden provided an opportunity to reclaim and revitalize the neighborhood, to manage and influence the landscape planning, to influence the quality of the urban ecosystem, to bring together various people and to create alliances with other movements. The association members took part in the daily make of the urban framework, by acquiring responsibilities in shaping the neighborhood and more widely

the city. This, entitle people to actively participate in urban planning. This is strongly connected with “right to the city” research and movement (Lefebvre 1991).

This story reveals the importance of rethinking environmental conservation as the context-related search for a good life (Chan et al. 2016, Klain et al. 2017). More generally, this story is the story of an environmental stewardship initiative that wishes to include community gardens as an implicit part of urban planning. Consistently with previous studies (e.g. Lai 2013) the care of this green space laid the foundations for sensitivity to an area that otherwise would have degraded further. More, the activities deployed to inform city dwellers and to save the garden did influence local public policies. This story highlights the need to pay attention to micro-practices and, more generally, to unexpected outcomes of different forms of involvements in social-ecological practices.

Besides, this story revealed profound divergences in the visions of different gardeners. First, the gardeners showed a sort of place attachment, which can be defined as the emotional bonds that arise from familiarity, a sense of belonging or an ideology that plays a role in motivating individuals to attend to, care for and take actions on behalf of particular places (Hidalgo and Hernandez 2001). These attachments are generally reflected in emotional values and meanings which are immaterial: collective memories, cultural symbols, relationships or personal history (Lefebvre 1991, Harvey 2006). Here, we revealed the diversity of reasons creating an attachment to the garden: its natural elements, the social-ecological relations it produced or the effects of the community garden initiative in revitalizing the neighborhood, building community or improving people’s lives. Consistently with Sebastien's (2016) study, we revealed also that this place attachment could act both as a factor of conflict and as a factor of collective mobilization to protect a loved space.

Yet, for local authorities, our study suggests that the garden was only a “vacant land” which could be relocated anywhere at any time. This representation does not recognize the complexity of the garden, regarding the biodiversity dynamic present in it, but also the relational network implemented in this social-ecological system.

To conclude, urban policies concerning civic practices such as community gardens in a temporal context send a blurred message about environmental conservation because they relativize the time needed to establish social-ecological relations or biodiversity settle. As Drake and Lawson (2014:141) stated “perhaps gardens should not be seen as a solution to vacancy, but as a replacement of vacancy”.

The conflict addressed here revealed one of the striking features of conservation and urban planning, that is the difficulty to show their complexity. In terms of advancing a critical interpretation of both, the challenge for policy decision-makers is to sustain environmental stewardships that foster structural changes, even at local scale. Considering social-ecological meaningful values of inhabitants toward their territory, as well as civic ecological practices, should have an increasing place in environmental conservation and political agenda.

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Literature cited

- Ansell, C. K. (2003). Community embeddedness and collaborative governance in the San Francisco Bay Area Environmental Movement. In *Social Movements and Networks* (Oxford University Press, pp. 123–144). Oxford UK: M. Diani and D. McAdam.
- Barthel, S., Folke, C., & Colding, J. (2010). Social–ecological memory in urban gardens—Retaining the capacity for management of ecosystem services. *Global Environmental Change*, 20(2), 255–265.
<https://doi.org/10.1016/j.gloenvcha.2010.01.001>
- Bourdieu, P. (2000). *Esquisse d’une théorie de la pratique: précédé de trois études d’ethnologie kabyle*. Paris: Ed. du Seuil.
- Chan, K. M. A., Balvanera, P., Benessaiah, K., Chapman, M., Díaz, S., Gómez-Baggethun, E., ... Turner, N. (2016). Opinion: Why protect nature? Rethinking values and the environment. *Proceedings of the National Academy of Sciences*, 113(6), 1462–1465.
<https://doi.org/10.1073/pnas.1525002113>
- Chapin, F. S., Carpenter, S. R., Kofinas, G. P., Folke, C., Abel, N., Clark, W. C., Swanson, F. J. (2010). Ecosystem stewardship: sustainability strategies for a rapidly changing planet. *Trends in Ecology & Evolution*, 25(4), 241–249.
<https://doi.org/10.1016/j.tree.2009.10.008>
- Clayton, S., Colléony, A., Conversy, P., Maclouf, E., Martin, L., Torres, A.-C., Truong, M.-X., Prévot, A.-C. (2017). Transformation of Experience: Toward a New Relationship with Nature: New experiences of nature. *Conservation Letters*.
<https://doi.org/10.1111/conl.12337>

- Clément, G. (2012). *Jardins, paysage et génie naturel*. Paris: Collège de France : Fayard.
- Diani, M. (1992). The Concept of Social Movement. *The Sociological Review*, 40(1), 1–25.
<https://doi.org/10.1111/j.1467-954X.1992.tb02943.x>
- Drake, L., & Lawson, L. J. (2014). Validating verdancy or vacancy? The relationship of community gardens and vacant lands in the U.S. *Cities*, 40, 133–142.
<https://doi.org/10.1016/j.cities.2013.07.008>
- Eizenberg, E. (2013). *From the ground up: community gardens in New York City and the politics of spatial transformation*. Farnham, Surrey, England; Burlington, VT: Ashgate.
- Ernstson, H., Sörlin, S., & Elmqvist, T. (2008). Social movements and ecosystem services - the role of social network structure in protecting and managing urban green areas in Stockholm. *Ecology and Society*, 13(2), 39.
- Guitart, D., Pickering, C., & Byrne, J. (2012). Past results and future directions in urban community gardens research. *Urban Forestry & Urban Greening*, 11(4), 364–373.
<https://doi.org/10.1016/j.ufug.2012.06.007>
- Hache, É. (2012). Introduction. Quel est l'objet de l'écologie? In *Ecologie Politique: cosmos, communautés, milieux* (Amsterdam, pp. 11–18). Paris.
- Hackworth, J. (2007). *The Neoliberal city: governance, ideology, and development in American urbanism* (Cornell University Press). Ithaca.
- Harvey, D. (2006). *Space of global capitalism: towards a theory of uneven geographical development* (Verso). New York.
- Hidalgo, M., & Hernandez, B. (2001). Place attachment: conceptual and empirical questions. *Journal of Environmental Psychology*, 21, 273–281.
- Hopkins, R. (2008). *The Transition Handbook* (Green Books). Totnes.

- Hou, J., Johnson, J., & Lawson, L. J. (2009). *Greening cities, growing communities: learning from Seattle's urban community gardens*. Washington, D.C: Landscape Architecture Foundation in association with University of Washington Press, Seattle & London.
- INSEE. (2014). Comptateur de territoires. Commune du Pré-Saint-Gervais (93061). Retrieved from <https://www.insee.fr/fr/statistiques/1405599?geo=COM-93061>
- Jardin des Jeunes Pouces. (2017). Jardin des Jeunes Pouces facebook page. Retrieved from <https://www.facebook.com/JardinDesJeunesPouces/>
- Klain, S. C., Olmsted, P., Chan, K. M. A., & Satterfield, T. (2017). Relational values resonate broadly and differently than intrinsic or instrumental values, or the New Ecological Paradigm. *PLOS ONE*, 12(8), e0183962. <https://doi.org/10.1371/journal.pone.0183962>
- Kokopelli. (2016). Web page. Retrieved from <https://kokopelli-semences.fr/?lang=fr-fr>
- Krasny, M. E., Crestol, S. R., Tidball, K. G., & Stedman, R. C. (2014). New York City's oyster gardeners: Memories and meanings as motivations for volunteer environmental stewardship. *Landscape and Urban Planning*, 132, 16–25. <https://doi.org/10.1016/j.landurbplan.2014.08.003>
- Krasny, M. E., & Tidball, K. G. (2012). Civic ecology: a pathway for Earth Stewardship in cities. *Frontiers in Ecology and the Environment*, 10(5), 267–273. <https://doi.org/10.1890/110230>
- Lai, F. (2013). Nature and the city: the salt-works park in the urban area of Cagliari (Sardinia, Italy). *Journal of Political Ecology*, 20, 229–341.
- Lawson, L. J. (2005). *City bountiful: A century of community gardening in America* (University of California Press). Berkeley.
- Le Pouce Vert. (2014). L'Histoire. Retrieved from <http://lepoucevert.org/lhistorique/>

- Le Pouce Vert. (2015). Nos ateliers pedagogiques. Retrieved from <http://lepoucevert.org/nos-ateliers-pedagogiques/>
- Lefebvre, H. (1991). *The Production of Space* (Blackwell). Oxford.
- Matteson, K. C., Ascher, J. S., & Langellotto, G. A. (2008). Bee Richness and Abundance in New York City Urban Gardens. *Annals of the Entomological Society of America*, 101(1), 140–150. [https://doi.org/10.1603/0013-8746\(2008\)101\[140:BRAAIN\]2.0.CO;2](https://doi.org/10.1603/0013-8746(2008)101[140:BRAAIN]2.0.CO;2)
- Matteson, K. C., & Langellotto, G. A. (2011). Small scale additions of native plants fail to increase beneficial insect richness in urban gardens: Native plant additions in urban gardens. *Insect Conservation and Diversity*, 4(2), 89–98. <https://doi.org/10.1111/j.1752-4598.2010.00103.x>
- Moore, S. (2006). Forgotten roots of the green city: Subsistence gardening in Columbus, Ohio, 1900-1940. *Urban Geography*, 27, 174–192.
- Orthner, S. (1984). Theory in Anthropology since the Sixties. *Comparative Studies in Society and History*, 26(1), 126–166.
- Pinalie, O. (2016). *Chronique d'un jardin solidaire*. Paris: Editions CNT-RP.
- Rosol, M. (2012). Community volunteering as neoliberal strategy? Green space production in Berlin. *Antipode*, 44(1), 365–381.
- Routledge, P. (2003). Convergence space: process geographies of grassroots globalization networks. *Transactions of the Institute of British Geographers*, 28(3), 333–349. <https://doi.org/10.1111/1475-5661.00096>
- Ryan, R. M., & Deci, E. L. (2001). On Happiness and Human Potentials: A Review of Research on Hedonic and Eudaimonic Well-Being. *Annual Review of Psychology*, 52(1), 141–166. <https://doi.org/10.1146/annurev.psych.52.1.141>

- Saldivar-tanaka, L., & Krasny, M. E. (2004). Culturing community development, neighborhood open space, and civic agriculture: The case of Latino community gardens in New York City. *Agriculture And Human Values*, 21(4), 399–412. <https://doi.org/10.1007/s10460-003-1248-9>
- Schmelzkopf, K. (1995). Urban community gardens as contested space. *America Geographical Society*, 85(3), 364–381.
- Schmelzkopf, K. (2002). Incommensurability, land use, and the right to space: Community gardens in New York City. *Urban Geography*, (23), 323–343.
- Sebastien, L. (2016). L’attachement au lieu, vecteur de mobilisation collective ? : Étude de cinq territoires ruraux. *Norois*, (238–239), 23–41. <https://doi.org/10.4000/norois.5846>
- Smith, C. M., & Kurtz, H. E. (2003). Community Gardens and Politics of Scale in New York City. *Geographical Review*, 93(2), 193–212.
- Staeheli, L. A., Mitchell, D., & Gibson, K. (2002). Conflicting rights to the city in New York’s community gardens. *GeoJournal*, 58(2/3), 197–205. <https://doi.org/10.1023/B:GEJO.0000010839.59734.01>
- Tidball, K. G., & Krasny, M. E. (2007). Chapter 7 From risk to resilience: what role for community greening and civic ecology in cities? In *Social learning: Toward a Sustainable World* (Wageningen Academic Publishers, pp. 149–164). Arjen Wals.
- Tidball, K. G., & Krasny, M. E. (2010). Urban environmental education from a social-ecological perspective: conceptual framework for civic ecology education. *Cities and the Environment*, 3(1).
- Tidball, K., & Krasny, M. (2014). Greening in the Red Zone. Disaster, Resilience and Community Greening. In *Greening in the red zone. Disaster, resilience and community greening* (Springer). New York.

Torres, A. C., Nadot, S., & Prévot, A.-C. (2017). Specificities of French community gardens as environmental stewardships. *Ecology and Society*, 22(3). <https://doi.org/10.5751/ES-09442-220328>

Ville du Pré Saint Gervais. (2013). Réaménagement de l'îlot Danton: Compte-rendu de l'atelier urbain. Retrieved from http://www.villedupre.fr/reamenagement_de_l_ilot_danton_compte_rendu_de_l_atelier_urbain.html

Ville du Pré Saint Gervais. (2014). Aménagement de l'îlot Danton. Déclassement des voiries publiques. Retrieved from http://www.villedupre.fr/dossier_denquete_publicue_danton.pdf

Ville du Pré Saint Gervais. (n.d.-a). Le Nouvel îlot Danton. Un espace de respiration au coeur du Pré Saint-Gerais. Retrieved from http://www.villedupre.fr/le_nouvel_ilot_danton.html

Ville du Pré Saint Gervais. (n.d.-b). Réaménagement de l'îlot Danton. Retrieved from http://www.villedupre.fr/reamenagement_de_l_ilot_danton.html

Ville du Pré-Saint-Gervais. (2013). Les Ateliers Urbains. Réaménagement de l'îlot Danton. Retrieved from http://www.villedupre.fr/Dossier_ilot_Danton_AU_web.pdf

CONCLUSION GENERALE ET PERSPECTIVES

Le parcours de cette recherche a commencé par une réflexion théorique collective (**premier chapitre**) qui m'a permis de repenser les expériences de nature. Nous nous sommes d'abord trouvés face à une multiplicité des définitions de nature qui témoignent des différentes notions qui lui sont associées. Les définitions multiples du mot nature peuvent faire référence à des entités qui s'échelonnent d'une simple fleur jusqu'à la « *wilderness* », ou différer suivant les degrés d'intervention humaine (Colléony, Prévot, Saint Jalme, & Clayton, 2017; Frumkin, 2013; Hartig, Mitchell, de Vries, & Frumkin, 2014). En corollaire de ces définitions diversifiées de la nature, les expériences de nature sont aussi diverses que les sujets qui les vivent. Nos réflexions croisées sur les diverses formes de nature et d'expérience nous ont conduits à proposer que ces expériences sont moins en train de s'éteindre (voir l'hypothèse de "l'extinction des expériences [de nature]" de Pyle (1978, 2003)) que de se transformer. Considérer la transformation des expériences de nature implique de considérer que ces expériences ne se limitent pas uniquement à un contact avec la nature ou avec ses éléments ; qu'elles ne se font pas uniquement dans la "*wilderness*", mais aussi en milieu urbain dans des parcs, des jardins, des zoos ou avec des éléments de nature ; qu'elles incluent une grande part de subjectivité, comme par exemple le désir de revivre des expériences de nature vécues dans l'enfance ou de vouloir permettre à d'autres (p. ex. des parents à leurs enfants) de vivre des expériences de nature qu'ils n'ont jamais eues.

C'est ainsi que les portes du **deuxième chapitre** se sont ouvertes. Je me suis focalisée sur les jardins partagés et j'ai exploré les motivations des jardiniers pour participer à ces initiatives. Ce travail a révélé que c'est souvent dans un moment de vide (personnel, social ou environnemental) que les jardiniers se sont investis dans le jardin partagé. J'ai démontré que les pratiques de jardinage et les processus socio-écologiques qui ont lieu dans ces espaces permettent aux jardiniers de combler ce vide. C'est dans cette réflexion que la notion de valeurs relation-

nelles (Chan et al., 2016; Klain, Olmsted, Chan, & Satterfield, 2017) a résonné dans ma pensée, car les jardins se construisent en dialogue avec les sujets intéressés pour répondre à des vides ou des absences. Comme Chan et al. (2016) le proposent, ce ne sont alors pas les jardins en eux-mêmes qui sont importants, mais les rapports et responsabilités qui dérivent des processus et des pratiques qui ont lieu dans ceux-ci, parce qu'ils impliquent des changements positifs chez les individus, dans leurs relations sociales et dans celles qu'ils entretiennent avec l'environnement. L'objectif ultime des jardiniers est la recherche de bien-vivre³⁷, une vie qui en vaut la peine (van den Born et al., 2017), objectif qui implique une transformation de leurs rapports socio-écologiques. Ces transformations sont structurantes, car elles passent par une reconnaissance des interdépendances socio-écologiques et par des engagements pour améliorer les socio-écosystèmes mais aussi des cadres de vie contraints pas la vie urbaine (à cause par exemple de la pollution ou du manque d'espaces verts). Dans ce sens, les initiatives collectives de jardins partagés renouvellent la façon de concevoir la conservation de la nature, qui dépasse la restauration d'espaces naturels et à la protection des espèces.

Dans le **troisième chapitre**, j'ai évalué les conséquences des pratiques des jardiniers sur la biodiversité des jardins (plus spécifiquement la flore spontanée), tandis que dans le **quatrième chapitre** j'ai évalué le rôle social des initiatives de jardins partagés au-delà des seuls jardiniers, auprès des riverains des jardins. Dans les deux cas, nous avons trouvé des résultats encourageants. Nous avons montré en effet que les jardins sont des endroits propices à l'installation d'une flore spontanée, mais que celle-ci est favorisée par l'action des jardiniers (p. ex. la non utilisation de pesticides ou la création d'une hétérogénéité des habitats) et par

³⁷ Dans le sens du *care* « une activité... qui inclut tout ce que nous faisons en vue de maintenir, de continuer ou de réparer notre « monde » de telle sorte que nous puissions y vivre aussi bien que possible. Ce monde inclut nos corps, nos individualités (selves) et notre environnement, que nous cherchons à tisser ensemble dans un maillage complexe qui soutient la vie » (Tronto & Maury, 2015) ; ou dans le sens des capacités, c'est à dire la possibilité de transformer des biens primaires en capacités effectives de mener la vie qu'on cherche (Sen, 1991). Dans ce sens, la recherche de bien-vivre est une fin et non une satisfaction superficielle. Il ne s'agit pas uniquement de se sentir bien.

les décisions des propriétaires du terrain (p. ex. en favorisant l'établissement de jardins sur une longue durée). La gestion des jardins étudiés montre une reconsidération de la relation des humains avec les systèmes naturels, qui inclue une attention accrue à l'espace et à la biodiversité présente.

Parallèlement, les résultats des enquêtes autour des jardins ont montré que les jardins offrent des occasions d'expériences de nature pour les riverains, soit directement (quand ils participent aux jardins), soit à travers des jardiniers. Les riverains reconnaissent également les bienfaits de ces jardins à plusieurs échelles : pour eux, pour les jardiniers, pour le quartier et pour la ville. La présence des jardins et les actions réalisées par les jardiniers ont donc des effets sur la société ; au-delà d'un modèle individualiste qui chercherait à remplir les seuls besoins des individus impliqués dans les jardins, ces initiatives s'insèrent dans un modèle de société qui cherche à inventer des pistes pour bien-vivre dans le socio-écosystème urbain.

L'étude exposée dans le **cinquième chapitre** a ouvert mes réflexions sur les valeurs relationnelles, qui apparaissent comme des moteurs pour l'action politique consistant à inventer collectivement des propositions solides et cohérentes. Cette étude m'a en effet permis de montrer comment le désir de créer un jardin comme un projet pour améliorer le cadre de vie local peut se transformer en projet politique. Un projet politique qui revendique des droits à la nature en ville, le droit d'utiliser des espaces publics gérés et aménagés par des citoyens, le droit d'améliorer leur espace et cadre de vie. Le conflit que j'ai étudié a permis de créer des groupes de citoyens qui portent un message collectif qui cherche à être défendu à travers le filtre de l'environnement.

Je pourrais donc synthétiser ce parcours de recherche en disant que ma thèse a montré comme le désir personnel d'expérience de nature peut avoir des effets politiques pour la conservation au niveau local.

Cette étude ouvre plusieurs perspectives à différentes dimensions.

Au niveau théorique : Travailler sur des liens théoriques entre le « *Shifting baseline* » (Pauly, 1995) et les transformations des expériences de nature, ainsi que sur les implications de ces phénomènes sur la conservation des socio-écosystèmes, me semble intéressant. Dans ce cadre, il me semble important de reconnaître et de travailler autour des expériences négatives de nature et des attachements associés.

Au niveau de l'individu : Il serait intéressant d'approfondir les effets des relations construites dans le jardin sur le bien-être et la santé des jardiniers. Cela pourrait donner un niveau de complexité aux études centrées sur les effets du jardinage sur la santé et le bien-être humain (voir p. ex. Soga, Gaston, & Yamaura, 2017).

Au niveau social : Une analyse fine de ces initiatives citoyennes devrait également prendre en compte les relations de pouvoir impliquées dans celles-ci (à l'intérieur des initiatives et avec d'autres institutions), par exemple analyser la façon dont les décisions sont prises, comment les bénéfices sont partagés ou savoir si les actions des personnes impliquées répondent à des agendas politiques personnels (Berkes, 2004; Escobar, 2005). En considérant que l'environnement n'est pas une question socialement neutre, des études complémentaires prenant en compte la diversité et les inégalités sociales sont nécessaires. En effet, comme le souligne Larrère (2017 : 16), « *beaucoup des politiques urbaines, soucieuses d'aménagement et de durabilité écologique, ne prennent pas en compte la diversité et l'inégalité sociales de ceux à qui elles s'appliquent... Cela peut être la conséquence involontaire de politiques insuffi-*

samment attentives à leurs effets sociaux, mais tient aussi au fait que les groupes sociaux favorisés recherchent intentionnellement des aménités environnementales ».

Dans la suite de ce que j'ai fait autour du conflit face à la fermeture du jardin le *Pouce Vert*, des études approfondies sur les conflits environnementaux urbains à différentes échelles permettraient donc de nourrir des réflexions sur les liens entre mise en place de valeurs relationnelles et action citoyenne ou politique face à des enjeux fonciers, pour la construction des bâtiments mais aussi pour le développement d'initiatives d'agriculture urbaine à but lucratif. Il me semble intéressant de continuer des études sur la portée des luttes pour protéger les espaces verts urbains et publics.

A une autre échelle d'ouverture, des études sur les liens tissés entre différents jardins ou avec d'autres mouvements sociaux qui cherchent à améliorer le cadre de vie dans des socio-écosystèmes permettraient de mieux comprendre la mise en place d'initiatives qui cherchent à coopérer avec la nature.

Au niveau des territoires : D'ailleurs, il me semble intéressant d'ouvrir la réflexion sur les valeurs relationnelles dans des zones rurales : comment se servir de cette grille d'analyse pour étudier d'autres conflits, tant il semble nécessaire de concilier des conceptions morales divergentes sans en imposer une au détriment des autres. C'est ce qui se fait déjà par exemple avec les reconnaissances des savoirs traditionnels, compris comme un complexe de connaissances, pratiques, et croyances. Des études considérant les aspects temporels (pré- et post-) pourraient également aider à clarifier certaines dynamiques, comme les effets concrets des comportements pro-environnementaux ou l'évolution des relations et processus.

Au niveau écologique : Parce que la présence d'une espèce dans un lieu donné à un moment donné n'est pas un gage de sa présence à long terme, suivre la richesse et l'abondance des

espèces de plusieurs groupes d'organismes pendant plusieurs années et dans différents sites (situés dans différents territoires) semble intéressant pour valoriser de façon plus approfondie le rôle écologique des jardins partagés. Des facteurs comme l'évolution de l'usage des sols, du climat ou la pollution, pourraient donner un diagnostic éclairé sur l'état et la dynamique écologique de ces espaces. Des études sur le rôle de ces espaces en lien avec d'autres espaces verts en ville semblent pertinentes dans les réflexions autour des trames vertes. Enfin, il me semble important d'évaluer les impacts des travaux des jardiniers sur les sols souvent pollués des jardins.

Au niveau de la gouvernance : Il semblerait important de voir comment les valeurs relationnelles peuvent être prises en compte dans la création et la mise en œuvre de politiques publiques.

Dans tout ce travail, j'ai montré à travers des méthodes quantitatives et qualitatives³⁸, que les valeurs relationnelles jouent un rôle crucial dans la motivation à conserver la nature. C'est donc important pour les organisations de conservation de la nature ainsi que pour les décideurs politiques de considérer ces valeurs relationnelles au moment de construire des projets de conservation qui visent à motiver l'action citoyenne. De même, prendre en compte ces valeurs me semble important à l'heure de développer des projets d'aménagement urbain. Aussi bien dans la conservation de l'environnement que dans l'aménagement urbain, les rapports de force mis en place rendent difficile l'expression de certains groupes sociaux ; je considère que les décisions ne peuvent se fonder exclusivement sur les évaluations des seuls experts et scientifiques. Or, il s'agit d'améliorer le processus de réflexion en co-construisant la décision,

³⁸ Comme souligné par Bennett et al. (2017) toutes les méthodes aboutissent à une connaissance distincte et importante, elles ont toutes des avantages et des inconvénients. L'utilisation des méthodes qualitatives et quantitatives peut ainsi nourrir une réflexion en essayant de surmonter les limites propres à chaque méthode. Ainsi, des méthodes inductives et déductives peuvent être nourries les unes des autres.

dans le cadre de démarches concertées avec les acteurs concernés, en explicitant davantage les apports scientifiques qui la fondent. Il s'agit aussi de reconnaître de plein droit la part active des habitants vis-à-vis de leur milieu de vie. Enfin, comme mentionné par Keucheyan, (2014), la santé, le bien-être et la qualité de vie sont des problématiques écologiques de plein droit³⁹ ; le principal défi pour la conservation de la nature est donc d'intégrer la pluralité des points de vue, des connaissances et des valeurs des citoyens ordinaires⁴⁰, ainsi que de redéfinir les processus de décision et les structures institutionnelles. Les jardins partagés sont des espaces potentiels de mise en œuvre de ces nouveaux processus socio-écologiques.

Dans ce sens, mes résultats ont des points de convergence avec l'écologie du sud (Guha & Martínez-Alier, 1997 ; Taleb, 2014) dans le sens que, peu importe si les mobilisations se font ou non au nom de l'écologie, l'essentiel est que ces mobilisations des citoyens ordinaires aient lieu pour améliorer leur socio-écosystème à travers la création des solutions alternatives.

Les relations qui se construisent dans des espaces aussi spécifiques que les jardins partagés urbains ne sont pas forcément mesurables, ce qui rend difficile toute comparaison avec d'autres initiatives de conservation, comme par exemple celles qui cherchent à protéger des espèces ou des écosystèmes en danger ou celles qui cherchent à responsabiliser des entreprises ou des pays sur leurs émissions de gaz à effet de serre. Cependant, à leur échelle, les citoyens impliqués directement ou indirectement dans ces initiatives prennent soin du socio-écosystème urbain et intègrent dans leur quotidien une volonté d'agir, de s'impliquer dans l'amélioration des socio-écosystèmes à travers des actions qui font se rejoindre des individus,

³⁹ C'est idée est proche de l'environnementalisme populaire qui envisage la conservation comme une mobilisation pour la qualité environnementale des espaces et lieux de vie des personnes et des collectivités humaines (Martinez-Alier, 2009).

⁴⁰ Il faut toujours considérer que des réactions de protection de la nature peuvent prendre des biais inattendus, parfois des décisions qui affectent la biodiversité soulèvent des réactions parfois bien plus d'ordre esthétique et patrimonial, que liées à des enjeux écologiques.

d'autres organismes vivants, des institutions, des communautés et des écosystèmes dans lesquels ces initiatives ont lieu.

Ma recherche n'a pas eu vocation à montrer les jardins partagés comme une panacée pour la conservation de l'environnement, mais elle propose que les réflexions sur la conservation de la nature intègrent les envies de coopérer avec les différents éléments des socio-écosystèmes, y compris la nature parce que ces coopérations sont importantes pour la vie des citoyens (valeurs relationnelles). Rechercher une vie-bonne devrait être considéré comme une des raisons valables pour justifier la conservation de l'environnement, en plus des valeurs intrinsèques ou pour les services qu'elle fournit. Ceci impliquerait de se donner le temps et les espaces nécessaires pour que ces relations aient lieu, et de favoriser les pratiques qui renforcent ou permettent des expériences de nature signifiantes pour les personnes (l'art, l'éducation relative à l'environnement, des pratiques individuelles et collectives, tout cela donne lieu à des processus sensoriels et affectifs importants pour créer ces expériences). Autrement dit, les projets de conservation devraient aussi impliquer ou conserver des processus relationnels.

Une approche de la conservation par des valeurs relationnelles impliquerait de contextualiser les cas (car les relations sont spécifiques aux contextes dans lesquelles elles ont lieu), mais aussi d'accepter que ces valeurs peuvent changer, qu'elles ne sont jamais stabilisées.

En outre, pour éviter de centrer les réflexions sur des relations « bonnes » ou « mauvaises », il me semble important de resituer chaque relation dans un ensemble plus vaste, non pas seulement vis-à-vis de la nature mais aussi vis-à-vis d'autres humains.

Au gré des chapitres qui constituent cette thèse, j'ai révélé les rôles socio-écologiques joués par les jardins partagés que j'ai étudiés : par ex. la fixation de l'azote pour la fait de laisser

pousser des plantes légumineuses, la fertilisation des sols grâce à l'apport de compost, la création d'habitats pour différents organismes, l'animation de la vie du quartier, la création d'opportunités pour des expériences socio-écologiques qui augmentent le bien-être individuel. J'ai aussi montré que les jardins partagés sont des lieux d'éducation relative à l'environnement, mais aussi qu'ils constituent une arène pour des mobilisations politiques qui cherchent à améliorer le cadre de vie. Si tous ces rôles m'ont fourni des éléments pour nourrir des réflexions sur la conservation de l'environnement, mon travail a aussi montré des limites à ces initiatives, en particulier liées à l'organisation des systèmes économique, social et politique. Par exemple, la plupart des jardiniers que j'ai rencontrés cherchent à acheter des semences non hybrides à des associations qui luttent pour le maintien des semences paysannes ou qui se positionnent contre l'agro-industrie, mais semences sont difficiles d'accès. Une autre difficulté est liée au fait que les espaces urbains vacants ne sont pas accessibles à des initiatives citoyennes pérennes ; dans ce sens ces initiatives peinent à assurer l'installation d'une biodiversité dynamique et d'expériences socio-écologiques significatives, ce qui restreint la capacité des citoyens à s'impliquer dans l'amélioration des socio-écosystèmes urbains. Malgré tous les efforts d'appropriation collective des questions portant sur la vie que nous voulons (p. ex. les semences paysannes, des quartiers vivants, des espaces verts en ville) pour répondre aux défis socio-écologiques urbains, les citoyens engagés se voient parfois dépossédés des moyens effectifs pour répondre à ces défis. Dans ce sens, comme Moore (2016) le souligne, l'Etat serait l'unique institution suffisamment importante et puissante pour garantir une place aux citoyens dans l'accès aux instances de décision et de réappropriation active des enjeux socio-écologiques, ainsi que pour exiger des entreprises plus de responsabilités socio-écologiques.

Pour alimenter toutes les réflexions présentées ici et pour chercher à sortir de modèles de pensée, de gouvernance et d'actions qui ne sont pas satisfaisants pour résoudre la crise de relations dans laquelle nous nous trouvons, pourquoi ne pas utiliser des méthodologies participatives pour établir des problématiques de recherche ensemble, avec des participants à des initiatives citoyennes et partager des connaissances avec eux ?

LITTERATURE CITEE

- Adams, L. (2005). Urban wildlife ecology and conservation: A brief history of the discipline. *Urban Ecosystems*, 8, 139–156.
- Agrawal, A., & Gibson, C. C. (1999). Enchantment and Disenchantment: The Role of Community in Natural Resource Conservation. *World Development*, 27(4), 629–649. [https://doi.org/10.1016/S0305-750X\(98\)00161-2](https://doi.org/10.1016/S0305-750X(98)00161-2)
- Alberti, M., Marzluff, J., Shulenberger, E., Bradley, G., Ryan, C., & Zumbrunnen, C. (2003). Integrating Humans into Ecology: Opportunities and Challenges for Studying Urban Ecosystems. *BioScience*.
- Altmann, P. (2016). Buen vivir como propuesta política integral: Dimensiones del Sumak Kawsay. *Mundos Plurales. Revista Latinoamericana de Políticas Y Acción Pública*, 3(1), 55–74.
- Andersson, E., Barthel, S., & Ahrné, K. (2007). Measuring social-ecological dynamics behind the generation of ecosystem services. *Ecological Applications: A Publication of the Ecological Society of America*, 17(5), 1267–1278.
- Andersson, Erik. (2006). Urban Landscapes and Sustainable Cities. *Ecology and Society*, 11(1), 34.
- Andersson, Erik, Barthel, S., Borgström, S., Colding, J., Elmqvist, T., Folke, C., & Gren, Å. (2014). Reconnecting Cities to the Biosphere: Stewardship of Green Infrastructure and Urban Ecosystem Services. *AMBIO*, 43(4), 445–453. <https://doi.org/10.1007/s13280-014-0506-y>
- Barthel, S., Folke, C., & Colding, J. (2010). Social–ecological memory in urban gardens—Retaining the capacity for management of ecosystem services. *Global Environmental Change*, 20(2), 255–265. <https://doi.org/10.1016/j.gloenvcha.2010.01.001>
- Baudelet, L. (2015). Pollution et risque alimentaire dans les jardins partagés franciliens¹. *Revue D'ethnoécologie*, (8). <https://doi.org/10.4000/ethnoecologie.2441>

- Baudry, S., Scapino, J., & Rémy, E. (2014). L'espace public à l'épreuve des jardins collectifs à New York et Paris. *Géocarrefour*, 89(1–2), 41–51. <https://doi.org/10.4000/geocarrefour.9388>
- Bennett, N. J., Roth, R., Klain, S. C., Chan, K., Christie, P., Clark, D. A., Wyborn, C. (2017). Conservation social science: Understanding and integrating human dimensions to improve conservation. *Biological Conservation*, 205, 93–108. <https://doi.org/10.1016/j.biocon.2016.10.006>
- Berkes, F., & Folke, C. (1998). *Linking Social and Ecological Systems: Managment Practices and Social Mechanisms for Building Resilience* (Cambridge University Press). Cambridge, UK.
- Berkes, Fikret. (2004). Rethinking Community-Based Conservation. *Conservation Biology*, 18(3), 621–630. <https://doi.org/10.1111/j.1523-1739.2004.00077.x>
- Blandin, P. (2009). *De la protection de la nature au pilotage de la biodiversité* (Quae). France.
- Bonneuil, C., & Fressoz, J.-B. (2013). *L'événement anthropocène* (Editions du Seuil). Paris.
- Bowes, A. L., & Allen, D. G. (1969). Biology and conservation of the Quetzal. *Biological Conservation*, 1(4), 297–306. [https://doi.org/10.1016/0006-3207\(69\)90202-X](https://doi.org/10.1016/0006-3207(69)90202-X)
- Brockington, D., & Igoe, J. (2006). Eviction for conservation: a global overview. *Conservation & Society*, 4(3), 424–470.
- Busack, S. D. (1976). A review of the biology of the gold-striped salamander, *Chioglossa lusitanica* (amphibia: Salamandridae). *Biological Conservation*, 10(4), 309–319. [https://doi.org/10.1016/0006-3207\(76\)90004-5](https://doi.org/10.1016/0006-3207(76)90004-5)
- Cafaro, P., & Primack, R. B. (2014). Species extinction is a great moral wrong. Sharing the Earth with other species is an important human responsibility. Elsevier. Retrieved from <https://www.elsevier.com/connect/species-extinction-is-a-great-moral-wrong>

- Callicott, J. B. (1999). Intrinsic value in nature: a metaethical analysis. In *Beyond the land ethic: more essays in environmental philosophy* (University of New York Press, pp. 239–261). New York.
- Callicott, J. B. (2008). Contemporary criticism of the received wilderness idea. In *The Wilderness Debate Rages On: Continuing the Great New Wilderness Debate* (University of Georgia Press, pp. 24–31). Athens: Michael P. Nelson, John Baird Callicott.
- Cannon, A. (1999). The significance of private gardens for bird conservation. *Bird Conservation International*, 9(04), 287–297. <https://doi.org/10.1017/S095927090000349X>
- Carpenter, S. R., Mooney, H. A., Agard, J., Capistrano, D., DeFries, R. S., Diaz, S., ... Whyte, A. (2009). Science for managing ecosystem services: Beyond the Millennium Ecosystem Assessment. *Proceedings of the National Academy of Sciences*, 106(5), 1305–1312. <https://doi.org/10.1073/pnas.0808772106>
- Carson, R. (2012). *Printemps silencieux* (Wildproject). Marseille.
- Cavin, J. S., Ruegg, J., & Carron, C. (2010). Dossier « Approches urbaines insolites » – La ville des défenseurs de la nature : vers une réconciliation ? *Natures Sciences Sociétés*, 18(2), 113–121. <https://doi.org/10.1051/nss/2010016>
- Chan, K. M. A., Balvanera, P., Benessaiah, K., Chapman, M., Díaz, S., Gómez-Baggethun, E., ... Turner, N. (2016). Opinion: Why protect nature? Rethinking values and the environment. *Proceedings of the National Academy of Sciences*, 113(6), 1462–1465. <https://doi.org/10.1073/pnas.1525002113>
- Chancel, L., & Piketty, T. (2015). Carbon and inequality from Kyoto to Paris. Trends in the global inequality of carbon emissions (1998-2013) & prospects for an equitable adaptation fund. Paris school of economics. Retrieved from <http://piketty.pse.ens.fr/files/ChancelPiketty2015.pdf>

- Clayton, S., Colléony, A., Conversy, P., Maclouf, E., Martin, L., Torres, A.-C., ... Prévot, A.-C. (2017). Transformation of Experience: Toward a New Relationship with Nature: New experiences of nature. *Conservation Letters*. <https://doi.org/10.1111/conl.12337>
- Club de Rome. (1972). *Le rapport Meadows. Halte à la croissance* (Fayard). Paris.
- Colléony, A., Prévot, A.-C., Saint Jalme, M., & Clayton, S. (2017). What kind of landscape management can counteract the extinction of experience? *Landscape and Urban Planning*, 159, 23–31. <https://doi.org/10.1016/j.landurbplan.2016.11.010>
- Constanza, R., d'Arge, R., de Groot, R., Farber, S., Grasso, M., Hannon, B., ... van den Belt, M. (1997). The value of the world's ecosystem services and natural capital. *Nature*, 387, 253–260.
- Corner, E. J. H. (1968). Conservation? future prospects. *Biological Conservation*, 1(1), 21–26. [https://doi.org/10.1016/0006-3207\(68\)90008-6](https://doi.org/10.1016/0006-3207(68)90008-6)
- Coutard, O., & Lévy, J. P. (2010). *Ecologies urbaines* (Economica/Anthropos). Paris.
- Daily, G. (1997). *Nature's services: societal dependence on natural ecosystems* (Island Press). Washington D.C.
- Daily, G. C. (1997). *Nature's services: Societal dependence on natural ecosystems* (Island Press). Washington D.C.
- Damian, M. (2013). Mauvaise nouvelle pour le climat et les peuples de l'Amazonie ? Quatorzième ? : l'abandon du projet Yasuni-ITT de gel du pétrole en terre. *Natures Sciences Sociétés*, 21(4), 428–435. <https://doi.org/10.1051/nss/2014010>
- Davies, W. K. D. (2015). *Theme Cities: Solutions for Urban Problems*. Springer.
- Descola, P. (2005). *Par-delà nature et culture* (Gallimard). Paris.
- Eisenberg, J. F., & Seidensticker, J. (1976). Ungulates in southern Asia: A consideration of biomass estimates for selected habitats. *Biological Conservation*, 10(4), 293–308. [https://doi.org/10.1016/0006-3207\(76\)90003-3](https://doi.org/10.1016/0006-3207(76)90003-3)

- Ernstson, H. (2013). The social production of ecosystem services: A framework for studying environmental justice and ecological complexity in urbanized landscapes. *Landscape and Urban Planning*, 109(1), 7–17. <https://doi.org/10.1016/j.landurbplan.2012.10.005>
- Ernstson, H., & Sörlin, S. (2009). Weaving Protective Stories: Connective Practices to Articulate Holistic Values in the Stockholm National Urban Park. *Environment and Planning A*, 41(6), 1460–1479. <https://doi.org/10.1068/a40349>
- Escobar, A. (2005). El “postdesarrollo” como concepto y práctica social. In *Políticas de economía, ambiente y sociedad en tiempos de globalización* (Facultad de Ciencias Económicas y Sociales, Universidad Central de Venezuela, pp. 17–31). Caracas: Daniel Mato.
- Escobar, A. (2011). Epistemologías de la naturaleza y colonialidad de la naturaleza : variedades de realismo y constructivismo. In *Cultuar y Naturaleza : Aproximaciones a propósito del bicentenario de la independencia de Colombia*, (Jardin Botánico de Bogotá José Celestino Mutis, pp. 49-74). Colombia
- Petridge, E. D., Ascher, J. S., & Langellotto, G. A. (2008). The Bee Fauna of Residential Gardens in a Suburb of New York City (Hymenoptera: Apoidea). *Annals of the Entomological Society of America*, 101(6), 1067–1077. <https://doi.org/10.1603/0013-8746-101.6.1067>
- Folke, C., Biggs, R., Norström, A. V., Reyers, B., & Rockström, J. (2016). Social-ecological resilience and biosphere-based sustainability science. *Ecology and Society*, 21(3). <https://doi.org/10.5751/ES-08748-210341>
- Folke, C., & Gunderson, L. (2012). Reconnecting to the Biosphere: a Social-Ecological Renaissance. *Ecology and Society*, 17(4), 55.
- Frumkin, H. (2013). The Evidence of Nature and the Nature of Evidence. *American Journal of Preventive Medicine*, 44(2), 196–197. <https://doi.org/10.1016/j.amepre.2012.10.016>

- Fuller, R. A., Irvine, K. N., Devine-Wright, P., Warren, P. H., & Gaston, K. J. (2007). Psychological benefits of greenspace increase with biodiversity. *Biology Letters*, 3(4), 390–394. <https://doi.org/10.1098/rsbl.2007.0149>
- Gaston, K. J., Cush, P., Ferguson, S., Frost, P., Gaston, S., Knight, D., ... Warren, P. H. (2007). Improving the contribution of urban gardens for wildlife: some guiding propositions. *British Wildlife*, 18(3), 171–177.
- Glaeser, E., Kolko, J., & Saiz, A. (2000). Consumer city. *Harvard Institute of Economic Research*, (1901). Retrieved from http://scholar.harvard.edu/files/glaeser/files/consumer_city.pdf
- Goddard, M. A., Dougill, A. J., & Benton, T. G. (2010). Scaling up from gardens: biodiversity conservation in urban environments. *Trends in Ecology & Evolution*, 25(2), 90–98. <https://doi.org/10.1016/j.tree.2009.07.016>
- Godet, L., & Mathevet, R. (2015). Introduction. In *Pour une géographie de la conservation. Biodiversités, natures et sociétés* (L'Harmattan). Paris.
- González-García, A., Belliure, J., Gómez-Sal, A., & Dávila, P. (2009). The role of urban greenspaces in fauna conservation: the case of the iguana *Ctenosaura similis* in the “patios” of León city, Nicaragua. *Biodiversity and Conservation*, 18(7), 1909–1920. <https://doi.org/10.1007/s10531-008-9564-4>
- Grove, R. H. (1995). *Green imperialism. Colonial expansion, tropical island Edens and the origins of environmentalism, 1600-1860*. (Cambridge University Press). Cambridge, UK.
- Guha, R. (1989). Radical american environmentalism and wilderness preservation: a third world critique. *Environmental Ethics*, 11, 71–83.
- Guha, R., Martínez-Alier, J. (1997). *Varieties of Environmentalism. Essays North and South*. (Earthscan). Londres.

- Haberl, H., Erb, K. H., Krausmann, F., Gaube, V., Bondeau, A., Plutzer, C., ... Fischer-Kowalski, M. (2007). Quantifying and mapping the human appropriation of net primary production in earth's terrestrial ecosystems. *Proceedings of the National Academy of Sciences*, 104(31), 12942–12947. <https://doi.org/10.1073/pnas.0704243104>
- Hache, É. (2012). Introduction. Quel est l'objet de l'écologie ? In *Ecologie Politique : cosmos, communautés, milieux* (Amsterdam, pp. 11–18). Paris.
- Hackel, J. D. (1999). Community Conservation and the Future of Africa's Wildlife. *Conservation Biology*, 13(4), 726–734. <https://doi.org/10.1046/j.1523-1739.1999.98210.x>
- Hartig, T., Mitchell, R., de Vries, S., & Frumkin, H. (2014). Nature and Health. *Annual Review of Public Health*, 35(1), 207–228. <https://doi.org/10.1146/annurev-publhealth-032013-182443>
- Heede, R. (2014). Tracing anthropogenic carbon dioxide and methane emissions to fossil fuel and cement producers, 1854–2010. *Climatic Change*, 122(1–2), 229–241. <https://doi.org/10.1007/s10584-013-0986-y>
- Hutton, J., Adams, W. M., & Murombedzi, J. C. (2005). Back to the Barriers? Changing Narratives in Biodiversity Conservation. *Forum for Development Studies*, 32(2), 341–370. <https://doi.org/10.1080/08039410.2005.9666319>
- Institut national de la recherche agronomique (France), & Centre national du machinisme agricole, du génie rural, des eaux et des forêts (France). (2011). *Pesticides, agriculture et environnement réduire l'utilisation des pesticides et en limiter les impacts environnementaux*. Versailles: Quae.
- Jas, N. (2007). Public Health and Pesticide Regulation in France Before and After *Silent Spring*. *History and Technology*, 23(4), 369–388. <https://doi.org/10.1080/07341510701527435>

- Jonas, H. (2013). *Le principe responsabilité: une éthique pour la civilisation technologique*. Paris: Flammarion.
- Kareiva, P. M., McNally, B. W., McCormick, S., Miller, T., & Ruckelshaus, M. (2015). Improving global environmental management with standard corporate reporting. *Proceedings of the National Academy of Sciences*, 112(24), 7375–7382. <https://doi.org/10.1073/pnas.1408120111>
- Kareiva, P., & Marvier, M. (2012). What Is Conservation Science? *BioScience*, 62(11), 962–969. <https://doi.org/10.1525/bio.2012.62.11.5>
- Keucheyan, R. (2014). *La nature est un champ de bataille. Essai d'écologie politique* (La Découverte). Paris.
- Kirby, K. R. (2014). “New Conservation” as a Moral Imperative: New Conservation as a Moral Imperative. *Conservation Biology*, 28(3), 639–640. <https://doi.org/10.1111/cobi.12294>
- Klain, S. C., Olmsted, P., Chan, K. M. A., & Satterfield, T. (2017). Relational values resonate broadly and differently than intrinsic or instrumental values, or the New Ecological Paradigm. *PLOS ONE*, 12(8), e0183962. <https://doi.org/10.1371/journal.pone.0183962>
- Kluckhohn, F. R., & Strodtbeck, F. L. (1961). *Variations in value orientations* (Row, Peterson, Evanston, IL.).
- Krasny, M. E., Crestol, S. R., Tidball, K. G., & Stedman, R. C. (2014). New York City’s oyster gardeners: Memories and meanings as motivations for volunteer environmental stewardship. *Landscape and Urban Planning*, 132, 16–25. <https://doi.org/10.1016/j.landurbplan.2014.08.003>
- Larrère, C. (1997). *Les philosophies de l'environnement* (Presses Universitaires de France). Paris.

- Larrère, C. (2010). Les éthiques environnementales. *Natures Sciences Sociétés*, 18(4), 405–413.
- Larrère, C. (2017). Quelle égalité pour l'écologie politique ? In *Les inégalités environnementales*. (Presses universitaires de France). Paris.
- Laugier, S. (2009). Le sujet du care : vulnérabilité et expression ordinaire. In *Qu'est-ce que le care: souci des autres, sensibilité, responsabilité* (Payot). Paris.
- Laugier, S. (2015). Care, environnement et éthique globale. *Cahiers Du Genre. Genre et Environnement. Nouvelles Menaces, Nouvelles Analyses Au Nord et Au Sud*, (59), 127–152.
- Lefeuve, J. C. (1989). L'écologie ne peut plus être une réflexion sur la nature. In *La question de la nature aujourd'hui* (ARF Editions/L'Harmattan, pp. 23–30). Paris: Mathieu N., Jollivet M.
- Lewis, S. L., & Maslin, M. A. (2015). Defining the Anthropocene. *Nature*, 519(7542), 171–180. <https://doi.org/10.1038/nature14258>
- Luederitz, C., Brink, E., Gralla, F., Hermelingmeier, V., Meyer, M., Niven, L., ... von Wehrden, H. (2015). A review of urban ecosystem services: six key challenges for future research. *Ecosystem Services*, 14, 98–112. <https://doi.org/10.1016/j.ecoser.2015.05.001>
- Mace, G. M. (2014). Whose conservation? *Science*, 345(6204), 1558–1560. <https://doi.org/10.1126/science.1254704>
- Maris, V., Roche, P., Levrel, H., & Geijzendorffer, I. (2016). Introduction. Regards croisés sur les valeurs de la biodiversité et les services écosystémiques. In *Valeurs de la biodiversité et services écosystémiques. Perspectives interdisciplinaires*. (Quae). France.

- Marris, E. (2014). “New conservation” is an expansion of approaches, not an ethical orientation: “New conservation” is an expansion of approaches, not an ethical orientation. *Animal Conservation*, 17(6), 516–517. <https://doi.org/10.1111/acv.12129>
- Martínez Alier, J. (2009). *El ecologismo de los pobres: conflictos ambientales y lenguajes de valoración* (3. ed. ampl). Barcelona: Icaria.
- Marvier, M. (2014). New Conservation Is True Conservation: Editorial. *Conservation Biology*, 28(1), 1–3. <https://doi.org/10.1111/cobi.12206>
- Marvier, M., & Kareiva, P. (2014). The evidence and values underlying “new conservation.” *Trends in Ecology & Evolution*, 29(3), 131–132. <https://doi.org/10.1016/j.tree.2014.01.005>
- Marzluff, J. M., Bowman, R., & Donnelly, R. (2001). *Avian ecology and conservation in an urbanizing world*. New York: Springer Science+Business Media, LLC. Retrieved from <http://site.ebrary.com/id/10649439>
- Mathevet, R. (2010). Dossier “Le réveil du dodo III”. Peut-on faire de la biologie de la conservation sans les sciences de l’homme et de la société? état des lieux. *Natures Sciences Sociétés*, 18(4), 441–445.
- Mathevet, R. (2012). *La Solidarité Ecologique. Ce lien qui nous oblige* (Actes Sud). France.
- Mathevet, R., & Marty, P. (2015). Chapitre 1. La géographie de la conservation : entrevoir, voir et porter attention à la biodiversité. In *Pour une géographie de la conservation. Biodiversités, natures et sociétés*. (L’Harmattan). Paris.
- McKINNEY, M. L. (2002). Urbanization, Biodiversity, and Conservation. *BioScience*, 52(10), 883. [https://doi.org/10.1641/0006-3568\(2002\)052\[0883:UBAC\]2.0.CO;2](https://doi.org/10.1641/0006-3568(2002)052[0883:UBAC]2.0.CO;2)
- McKinney, M. L. (2006). Urbanization as a major cause of biotic homogenization. *Biological Conservation*, 127(3), 247–260. <https://doi.org/10.1016/j.biocon.2005.09.005>

- Meine, C., Soule, M., & Noss, R. F. (2006). “A Mission-Driven Discipline”: the Growth of Conservation Biology. *Conservation Biology*, 20(3), 631–651. <https://doi.org/10.1111/j.1523-1739.2006.00449.x>
- Millennium ecosystem assessment. (2005). *Ecosystems and human well-being: Synthesis* (Island Press). Washington DC. Retrieved from <http://www.millenniumassessment.org/documents/document.356.aspx.pdf>
- Miller, B., Soulé, M. E., & Terborgh, J. (2014). “New conservation” or surrender to development?: “New conservation” or surrender to development? *Animal Conservation*, 17(6), 509–515. <https://doi.org/10.1111/acv.12127>
- Miller, J. R. (2005). Biodiversity conservation and the extinction of experience. *Trends in Ecology & Evolution*, 20(8), 430–434. <https://doi.org/10.1016/j.tree.2005.05.013>
- Miller, J. R., & Hobbs, R. J. (2002). Conservation Where People Live and Work. *Conservation Biology*, 16(2), 330–337. <https://doi.org/10.1046/j.1523-1739.2002.00420.x>
- Mitchell, R., & Popham, F. (2008). Effect of exposure to natural environment on health inequalities: an observational population study. *The Lancet*, 372(9650), 1655–1660. [https://doi.org/10.1016/S0140-6736\(08\)61689-X](https://doi.org/10.1016/S0140-6736(08)61689-X)
- Moore, J. W. (2016). *Anthropocene or capitalocene?: nature, history, and the crisis of capitalism*. Oakland, CA: PM Press.
- Nations Unies. (1992). Convention sur la diversité biologique. Retrieved from <https://www.cbd.int/doc/legal/cbd-fr.pdf>
- N.P. (1969). Human population and the biosphere. *Biological Conservation*, 1(2), 103–104. [https://doi.org/10.1016/0006-3207\(69\)90235-3](https://doi.org/10.1016/0006-3207(69)90235-3)
- Ostrom, E. (2009). A General Framework for Analyzing Sustainability of Social-Ecological Systems. *Science*, 325(5939), 419–422. <https://doi.org/10.1126/science.1172133>

- Paperman, P., & Laugier, S. (Eds.). (2005). *Le souci des autres: éthique et politique du care*. Paris: Éditions de l'École des hautes études en sciences sociales.
- Pauly, D. (1995). Anecdotes and the shifting baseline syndrome of fisheries. *Trends in Ecology & Evolution*, 10(10), 430.
- Peterken, G. F. (1968). International selection of areas for reserves. *Biological Conservation*, 1(1), 55–61. [https://doi.org/10.1016/0006-3207\(68\)90019-0](https://doi.org/10.1016/0006-3207(68)90019-0)
- Pimentel, D., Hurd, L. E., Bellotti, A. C., Forster, M. J., Oka, I. N., Sholes, O. D., & Whiteman, R. J. (1973). Food Production and the Energy Crisis. *Science*, 182(4111), 443–449. <https://doi.org/10.1126/science.182.4111.443>
- Pyle, R. M. (1978). The extinction of experience. *Horticulture*, 56, 64–67.
- Pyle, R. M. (2003). Nature matrix: reconnecting people and nature. *Oryx*, 37(2), 206–214.
- Redford, K., & Adams, W. (2009). Payment for Ecosystem Services and the Challenge of Saving Nature. *Conservation Biology*, 23(4), 785–787. <https://doi.org/10.1111/j.1523-1739.2009.01271.x>
- Reid, W. (2006). Nature: the many benefits of ecosystems studies, (443), 749.
- Richards, D. R., Passy, P., & Oh, R. R. Y. (2017). Impacts of population density and wealth on the quantity and structure of urban green space in tropical Southeast Asia. *Landscape and Urban Planning*, 157, 553–560. <https://doi.org/10.1016/j.landurbplan.2016.09.005>
- Sarkar, S. (1998). Restoring wilderness or reclaiming forests? *Terra Nova*, 3(3), 35–52.
- Sarkar, S. (1999). Wilderness preservation and biodiversity conservation-keeping divergent goals distinct. *BioScience*, 49, 405–412.
- Sarkar, S. (2009). Conservation Biology. In *Encyclopedia of environmental ethics and philosophy* (Mackmillan, Vol. 1, pp. 175–179). USA: Baird Callicott and Robert Frodeman.

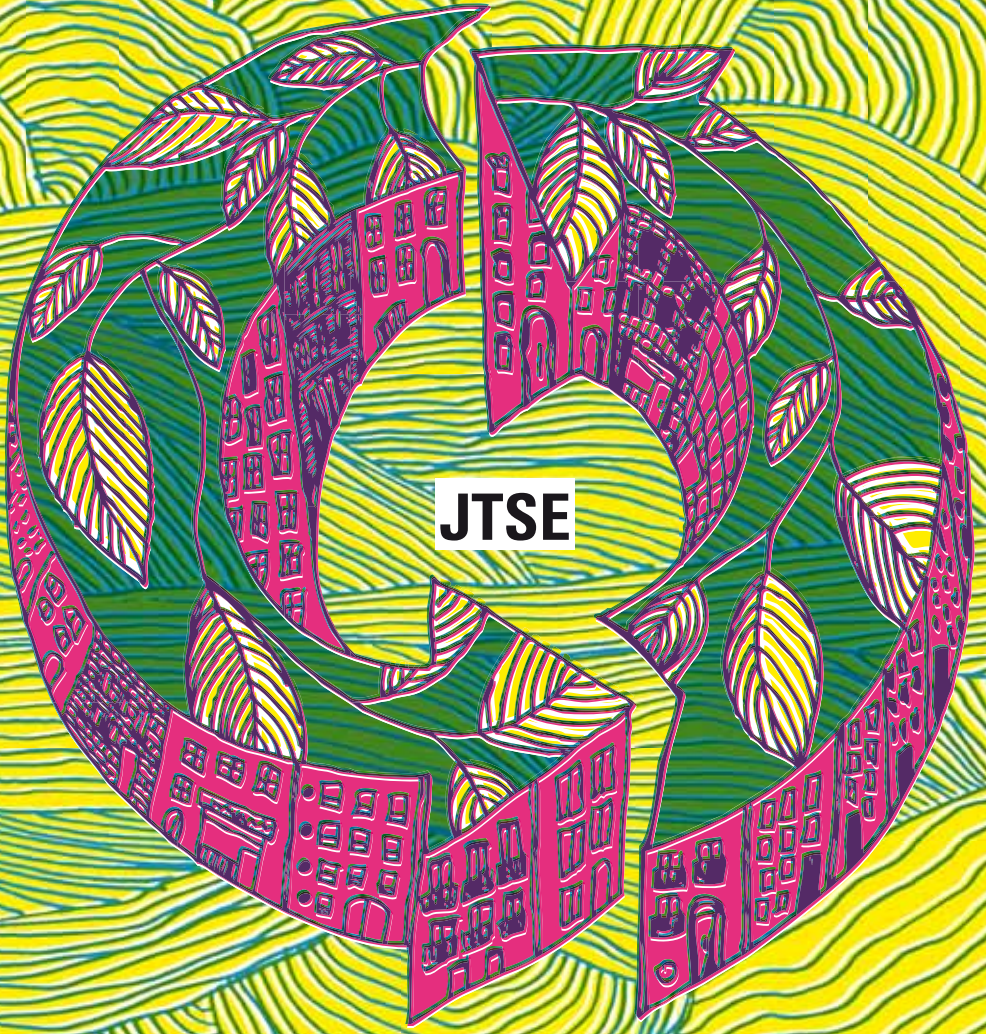
- Sarrazin, F., & Lecomte, J. (2016). Evolution in the Anthropocene. *Science*, 351(6276), 922–923. <https://doi.org/10.1126/science.aad6756>
- Sauvé, L., & Villemagne, C. (2005). L'éthique de l'environnement comme projet de vie et "chantier" social : un défi de formation. *Chemin de Traverse*.
- Sen, A. 1991. L'évaluation de la justice. In *Ehique et économie*. (Presses Universitaires de France). Paris.
- Shiva, V. (1992). *The Violence of Green Revolution: Third World Agriculture, Ecology and Politics* (Zed Books). Londres.
- Soga, M., & Gaston, K. (2016). Extinction of experience: the loss of human-nature interactions. *Frontiers in Ecology and the Environment*, 14(2), 94–101.
- Soga, M., Gaston, K. J., & Yamaura, Y. (2017). Gardening is beneficial for health: A meta-analysis. *Preventive Medicine Reports*, 5, 92–99. <https://doi.org/10.1016/j.pmedr.2016.11.007>
- Soulé, M. (1985). What is Conservation Biology? *BioScience*, 35(11).
- Spash, C. L. (2015). Bulldozing biodiversity: The economics of offsets and trading-in Nature. *Biological Conservation*, 192, 541–551. <https://doi.org/10.1016/j.biocon.2015.07.037>
- Sperling, C. D., & Lortie, C. J. (2010). The importance of urban backgardens on plant and invertebrate recruitment: a field microcosm experiment. *Urban Ecosystems*, 13(2), 223–235. <https://doi.org/10.1007/s11252-009-0114-y>
- Steffen, W., Crutzen, P. J., & McNeill, J. R. (2007). The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature. *AMBIO: A Journal of the Human Environment*, 36(8), 614–621. [https://doi.org/10.1579/0044-7447\(2007\)36\[614:TAAHNO\]2.0.CO;2](https://doi.org/10.1579/0044-7447(2007)36[614:TAAHNO]2.0.CO;2)

- Steffen, W., Persson, Å., Deutsch, L., Zalasiewicz, J., Williams, M., Richardson, K., ... Svedin, U. (2011). The Anthropocene: From Global Change to Planetary Stewardship. *AMBIO*, 40(7), 739–761. <https://doi.org/10.1007/s13280-011-0185-x>
- Tallis, H., & Lubchenco, J. (2014). Working together: A call for inclusive conservation. *Nature*, 515(7525), 27–28. <https://doi.org/10.1038/515027a>
- Trall, L., Bradshaw, C., & Brook, B. (2007). Minimum viable population size: A meta-analysis of 30 years of published estimates. *Biological Conservation*, 139(1–2), 159–166. <https://doi.org/10.1016/j.biocon.2007.06.011>
- Tronto, J. C., & Maury, H. (2015). *Un monde vulnérable : pour une politique du care*. Paris: La Découverte.
- UNESCO. (1968). Intergovernmental Conference of Experts on the Scientific Basis for Rational Use and Conservation of the Resources of the Biosphere. Document resume. Retrieved from <http://files.eric.ed.gov/fulltext/ED047952.pdf>
- United Nations. (2015). 2014 Revision of World Urbanisation Prospects.
- van den Born, R. J. G., Arts, B., Admiraal, J., Beringer, A., Knights, P., Molinario, E., ... De Groot, W. T. (2017). The missing pillar: Eudemonic values in the justification of nature conservation. *Journal of Environmental Planning and Management*, 1–16. <https://doi.org/10.1080/09640568.2017.1342612>
- Waters, C. N., Zalasiewicz, J., Summerhayes, C., Barnosky, A. D., Poirier, C., Ga uszka, A., ... Wolfe, A. P. (2016). The Anthropocene is functionally and stratigraphically distinct from the Holocene. *Science*, 351(6269), aad2622-aad2622. <https://doi.org/10.1126/science.aad2622>
- Wegner, G., & Pascual, U. (2011). Cost-benefit analysis in the context of ecosystem services for human well-being: A multidisciplinary critique. *Global Environmental Change*, 21(2), 492–504. <https://doi.org/10.1016/j.gloenvcha.2010.12.008>

- Whitelock, D. A. (1985). *Conquest to conservation: history of human impact on the South Australian environment*. Netley, S. Aust: Wakefield Press.
- Wilkinson, C., Saarne, T., Peterson, G. D., & Colding, J. (2013). Strategic Spatial Planning and the Ecosystem Services Concept - an Historical Exploration. *Ecology and Society*, 18(1). <https://doi.org/10.5751/ES-05368-180137>

ANNEXES

Annexe 1. Charte « La Terre en partage »

A stylized illustration of a city skyline, including various buildings and houses, enclosed within a circular frame composed of green leaves and stems. The background is filled with wavy, concentric lines in shades of yellow and green, creating a textured, organic effect.

JTSE

**LE JARDIN DANS TOUS SES ÉTATS,
EST LE RÉSEAU NATIONAL
DES JARDINS PARTAGÉS**

LES VALEURS QUE NOUS PARTAGEONS

À l'occasion du premier forum national «Jardinage et citoyenneté: le jardin dans tous ses états», qui s'est déroulé à Lille les 23 et 24 octobre 1997, des acteurs associatifs, institutionnels, politiques et professionnels ont échangé des expériences de jardins aux expressions diverses, mais porteuses de valeurs communes d'échange, de créativité, de solidarité entre les communautés et de liens retrouvés avec le monde vivant.

Poursuivant la dynamique enclenchée par ce temps fort d'échanges, les acteurs de ce réseau partagent et soutiennent les valeurs communes à ces actions:

- » Pour le **RENFORCEMENT DE LIENS SOCIAUX**, là où les conditions d'existence ont contribué à distendre les mailles de la vie sociale, de l'entraide et du dialogue
- » Pour que les citoyens, sans aucune discrimination culturelle, ethnique ou sociale, puissent **S'APPROPRIER LEUR CADRE DE VIE** quotidien et l'enrichir
- » Pour **DONNER UN POINT D'APPUI AUX PERSONNES EN DIFFICULTÉ** aux fins de retrouver utilité sociale et dignité, en ayant la possibilité de participer à un travail productif qu'il soit monétaire ou non
- » Pour nouer des liens généreux autant que respectueux avec la Terre et le monde vivant, et **AGIR DE FAÇON RESPONSABLE**
- » Pour le plaisir de créer, de goûter, de partager, comme de **NOUVELLES FORMES DE LIBERTÉ ET D'AUTONOMIE**

Pour toutes ces raisons, il nous semble important d'affirmer le droit de tous au jardin.

QUELQUES PRINCIPES D' ACTIONS DANS LA MISE EN OEUVRE

UN JARDIN DE PROJET

Un jardin, c'est avant tout un projet. Dans ce sens, nous soutenons les principes suivants :

- › La **DIVERSITÉ DES OBJECTIFS** contribue à la richesse des projets : écologiques, sociaux, culturels, éducatifs, artistiques, paysagers, thérapeutiques, etc., valorisent au mieux les atouts du jardin.
- › La diversité des publics et des usagers favorise la rencontre, les échanges, l'entraide : la **MIXITÉ SOCIALE, CULTURELLE** et **GÉNÉRATIONNELLE** des acteurs, facilite l'intégration des habitants d'origine étrangère, l'adaptation aux publics en difficulté...
- › La **CONCERTATION** est la base indispensable de tout projet. Elle doit impliquer les habitants, les futurs usagers et les intervenants sociaux, élus, techniciens, associations... Cette concertation doit s'attacher à faire ressortir la diversité et l'évolution des besoins, y compris ceux des enfants, des plus démunis et des moins intégrés culturellement, et éviter le clé en main et le pré-pensé.
- › L'aménagement doit intégrer le besoin des jardiniers de s'approprier leur jardin, les **SPÉCIFICITÉS DU TERRITOIRE** et le **MODE DE VIE DES USAGERS**.
- › La **SOUPLESSE ET L'ÉVOLUTIVITÉ DES PROJETS** sont garants de leur pérennisation et de leur cohérence avec leur contexte social, culturel, environnemental, économique et éducatif.

UNE QUALITÉ DE MISE EN ŒUVRE

Dans la mise en œuvre des projets de jardins, quelles que soient leurs formes, nous nous engageons à promouvoir :

- › La **GESTION PARTICIPATIVE** : elle organise des échanges entre les acteurs, prend en compte les souhaits, désirs et contraintes, s'efforce de faire place à la diversité des points de vue. Les règles d'accès et de fonctionnement sont définies collectivement.

- › L'**ANIMATION** : elle permet la pérennisation et l'évolution des projets. Elle est assurée par des personnes reconnues des acteurs, attentives à écouter la parole de tous et capables de comprendre et de guider les pratiques de chacun.
- › Le **RESPECT DE L'ENVIRONNEMENT** : il est assuré par la mise en œuvre de modes de gestion et de pratiques culturelles favorisant la biodiversité (sauvage ou domestique), respectueuses du vivant, intégrant une gestion écologique des cycles naturels, de l'eau et des déchets.
- › L'**INTÉGRATION PAYSAGÈRE DES JARDINS** : elle doit être recherchée, par la qualité des aménagements et des constructions (favorisant notamment l'auto construction dans de bonnes conditions), la prise en compte des caractéristiques environnementales des sites, la gestion et la mise en valeur des paysages...

Le **JARDIN DANS TOUS SES ÉTATS (JTSE)** est le nom d'une dynamique d'échanges entre les porteurs de projets de « jardins partagés » et leurs partenaires associatifs, politiques et institutionnels.

Ces jardins sont divers, mais portent des valeurs communes de partage, de créativité, de solidarité entre les communautés, d'aide aux personnes en difficultés, de liens retrouvés avec le monde vivant, de respect de notre environnement...

En cultivant la terre, ce sont les solidarités nouvelles, les échanges, l'épanouissement personnel, le respect du monde vivant, le bien-être que l'on irrigue, que l'on amende comme le terroir d'un nouveau développement humain et durable.

Les pratiques des jardins dans tous leurs états s'incarnent largement dans l'intelligence plus souriante du partage, des tentatives nouvelles, du développement des idées neuves. Elles participent en cela à donner le goût du mieux-vivre que nous voulons pour demain.

LES JARDINS PARTAGÉS : QUELLE HISTOIRE !

NAISSANCE

L'histoire des jardins collectifs n'est pas récente. Depuis le Moyen Age, l'idée de se regrouper à des fins utilitaires sur des terres collectives est observée dans de nombreux pays.

La révolution industrielle favorise l'émergence des jardins ouvriers. Les guerres et leurs privations incitent les habitants des villes à investir l'espace public pour y cultiver ce qui fait défaut dans les magasins. C'est au milieu des années 1970, à New York puis dans différentes villes d'Amérique du Nord, que des initiatives populaires investissent des endroits laissés vacants pour les transformer en jardins de quartiers. Plus de 750 seront créés dans la ville de New York ! Il ne s'agit plus seulement de produire de quoi se nourrir, mais aussi de se retrouver sur un terrain commun et des projets collectifs. Le sol et les idées sont partagés. Ainsi naissent les jardins partagés...

UNE APPROCHE POLITIQUE

Au milieu des années 1980, en France, quelques animateurs sociaux, militants de terrain et autres jardiniers s'intéressent à ces pratiques d'appropriation collective.

La *Fondation de France* voit là l'opportunité de développer le lien social, tout en prenant en compte, même partiellement, les préoccupations d'autosuffisance alimentaire. Avec son aide, plusieurs séjours sont organisés afin d'étudier les conditions d'émergence de telles initiatives en France.

Des petits groupes travaillent sur ces questions et adaptent, entre autre, les pratiques nord américaines à nos données urbaines et sociologiques. Ils réunissent au cours de deux colloques, Lille en 1997 et Nantes en 1999, plusieurs centaines de personnes impliquées dans ces initiatives ou désireuses de les développer.

Dès 1997, un réseau informel se met en place et s'organise rapidement, le réseau du **JARDIN DANS TOUS SES ÉTATS (JTSE)**.

Unis par des valeurs communes, formalisées par une Charte (**page 2**) ses

membres représentent la plupart des régions de France métropolitaine, dans lesquelles ils agissent pour favoriser la mise en œuvre, par les habitants, de jardins partagés.

Géré par un collectif d'une dizaine de structures régionales, associatives et coopératives, ce réseau est un interlocuteur reconnu par les différentes instances officielles, force de proposition à l'origine de nombreuses publications, formations ou rencontres autour de la question du jardin en partage.

DATES CLÉS

- » **1997**: Rédaction de la Charte de la terre en partage, création du **JARDIN DANS TOUS SES ÉTATS** avec le soutien de la *Fondation de France*
- » **1997 à Lille**: 1^{er} forum international *Jardin et Citoyenneté*, organisé la Ville de Lille et le réseau du **JARDIN DANS TOUS SES ÉTATS**
- » **1997-2001**: Appel à projets « De nouvelles natures à cultiver ensemble » de la *Fondation de France* qui a financé 189 projets
- » **1999 à Nantes**: 2^e forum international sur les jardins organisé par le **JARDIN DANS TOUS SES ÉTATS** et la Ville de Nantes
- » **2003**: Vote par le Sénat de la proposition de loi relative aux jardins collectifs, qui reconnaît l'existence des jardins partagés et d'insertion
- » **2003**: Création du programme parisien *Main Verte*. D'autres villes avaient déjà créé des politiques comme Lyon, Lille ou Nantes. Montpellier crée *Montpellier Main Verte* dans la foulée.
- » **2005 à Paris**: 3^e forum international sur les jardins organisé par la Ville de Paris et le réseau du **JARDIN DANS TOUS SES ÉTATS**
- » **2005-2011**: Développement des pôles régionaux, aide à la mise en place de politiques publiques à Toulouse, Marseille, Strasbourg.
- » **11 et 12 octobre 2012 à Strasbourg**: Colloque international « Villes jardénées et initiatives citoyennes », organisé par la Ville de Strasbourg, le réseau du **JARDIN DANS TOUS SES ÉTATS**, l'AFJDEVP et le CNFPT

NATIONAL



Le Jardin dans Tous Ses États

courriel: contact@jardins-partages.org

site: www.jardins-partages.org

CORRESPONDANTS RÉGIONAUX

GRAND EST

ECO-Conseil

7, rue Goethe - 67000 Strasbourg

tél. : 03 88 60 16 19 - fax : 03 88 61 07 12

courriel: contact@ecoconseil.org



MIDI-PYRÉNÉES

ARPE Midi Pyrénées,

l'agence régionale

du développement durable

Maison de l'Environnement

Midi-Pyrénées - 14, rue de Tivoli

31068 Toulouse Cedex 7

contact: Jean-Louis Fabry

tél.: 05 34 31 97 13

courriel: fabry.jl@arpe-mip.com

site: www.arpe-mip.com



ÎLE-DE-FRANCE

Graine de Jardins

21, rue de Jessaint - 75018 Paris

téls.: 09 82 42 43 46 - 06 68 55 75 18

courriel: contact@grainedejardins.fr

site: www.jardinons-ensemble.org



NORD-PAS-DE-CALAIS

Amis des Jardins Ouverts

et néanmoins clôturés (AJOnC)

13, rue Montaigne - 59000 Lille

tél.: 03 28 550 330 - fax : 03 28 550 331

courriel: ajonc@free.fr

site: www.ajonc.org



LANGUEDOC- ROUSSILLON

Association *État des Lieux*

courriel: etat.des.lieux@orange.fr

site: en cours d'élaboration

**BASSE-NORMANDIE**

Association Régionale
pour le Développement
de l'Économie Solidaire (ARDES)

Maison des Solidarités

51, quai de Juillet - 14000 CAEN

tél.: 02 31 82 43 91

contact: Jean Baptiste Cazin

courriel: ardes-bn@wanadoo.fr

site: www.ardes.org

**SUD EST**

Réseau des Jardins Solidaires
Méditerranéens

4, Cours de la République, BP 20017

13350 Charleval - **tél.:** 09 63 24 55 57

courriel: contact@reseaujsm.org

**BRETAGNE**

Vert le Jardin

Venelle de Kergonan - 29200 BREST

téls.: 02 98 46 06 92 - 06 66 89 06 24

courriel: vertlejardin@wanadoo.fr

site: www.vertlejardin.infini.fr

**RHÔNE-ALPES**

le passe-jardins

131, rue Challemel-Lacour

69008 Lyon

tél.: 04 78 00 22 59 - **fax:** 04 78 00 22 95

courriel: contact@lepassajardins.fr

site: www.lepassajardins.fr

**AQUITAINE**

SaluTerre

67, rue Denfert Rochereau

33220 Sainte-Foy-la-Grande

tél.: 05 57 46 04 37

courriel: contact@saluterre.com

site: www.saluterre.com



Annexe 2. Convention cadre d'occupation et d'usage pour la gestion d'un jardin collectif

Programme des Jardins Partagés « Main Verte »

Convention cadre d'occupation et d'usage pour la gestion d'un jardin collectif



Entre, d'une part, la Ville de Paris, domiciliée place de l'Hôtel de Ville, 75004 Paris représentée par le Maire de Paris agissant en vertu d'une délibération du Conseil de Paris en date des Ci après dénommée « la Ville de Paris »,

OU

Entre, d'une part, la Ville de Paris, domiciliée place de l'hôtel de Ville, 75004 Paris, représentée par le Maire du Xème arrondissement, agissant en vertu d'une délibération du Conseil du Xème arrondissement en date du
Ci après dénommée « la Ville de Paris »,

et, d'autre part, l'Association « », constituée le, déclarée à la Préfecture de Paris le, sous le n° domiciliée au et représentée par son président, ci-après dénommée « l'Association ».

Il est exposé et convenu ce qui suit :

Article 1^{er} **Objet :**

La présente convention précise les modalités de mise à disposition par la Ville de Paris, à titre précaire et révocable, d'une parcelle de terrain de m² située au, tel qu'indiqué sur le plan annexé à la présente convention.

Ce terrain est mis à la disposition de l'Association, pour un usage de jardinage collectif, conformément aux engagements prévus par la charte Main Verte des jardins partagés de Paris, charte à laquelle l'Association doit obligatoirement adhérer.

La présente convention constitue une autorisation d'occupation du domaine public accordée à l'Association à titre gratuit pour lui permettre d'y mener les activités décrites à l'article 4.

Article 2 **Apport matériel de la Ville de Paris :**

a/ En plus de la parcelle susvisée, la Ville de Paris met à la disposition de l'Association :

- un aménagement constitué de
(exemples : * d'une couche drainante, comprise entre deux géotextiles, surmontée d'une couche de terre végétale
* de bacs hors-sol

- * de bacs sacs
- * de terre végétale)

- une arrivée d'eau si nécessaire, la consommation d'eau restant à la charge de l'association

b/ Un état des lieux est établi par les parties à la date de début et à la date de fin de l'effet de la présente convention.

Lors du premier état des lieux, la Ville de Paris remet à l'Association une fiche qui retrace l'historique des principales activités locales connues à ce jour susceptibles d'avoir dégradé la qualité des sols de la parcelle susvisée. Cette fiche, établie à partir d'une étude de pré-expertise, préconise des aménagements adaptés pris en compte dans l'aménagement de la dite parcelle.

c/ La Ville de Paris assurera les gros travaux de l'infrastructure mise à disposition.

Article 3 **Durée - Résiliation :**

a/ La présente convention est conclue pour une durée de un an reconductible par tacite reconduction jusqu'à six ans obligatoirement, sauf dans le cas d'un projet sur une parcelle affectée temporairement à un usage de jardin partagé. Au terme de ces six ans, une nouvelle convention devra être conclue. La convention prend effet à compter de la date de sa signature par les parties, après délibération des élus du [Conseil de Paris / Conseil d'arrondissement], et de la transmission des documents d'assurance prévus à l'article 5, alinéa m.

b/ L'Association transmet chaque année son rapport d'activité à la Ville de Paris. Au vu de ce rapport, les représentants de la Ville de Paris se réservent le droit de ne pas reconduire la convention.

c/ La convention peut être résiliée avant terme à l'initiative de l'une des parties sous la condition du respect d'un préavis de trois mois. Cette résiliation ne saurait donner lieu au versement d'indemnités de compensation.

d/ Le préavis mentionné à l'alinéa précédent n'est pas opposable à la Ville de Paris en cas de manquement grave et manifeste de l'Association à ses obligations, telles que stipulées dans la présente convention. En cas d'un tel manquement, et après recherche de conciliation, l'Association devra libérer les lieux et les remettre en l'état dans les quinze jours suivant le commandement du représentant de la Ville de Paris.

Article 4 **Activités et objectifs de l'Association**

Cet article pourra être complété et adapté par les services de la mairie d'arrondissement, au vu des nécessités locales et du projet de l'association et en concertation avec celle-ci.

a/ Les membres de l'Association ont en commun le projet de jardiner et d'entretenir la parcelle de terrain qui lui est confiée. L'Association s'engage à organiser sur le jardin les activités suivantes :

Projet de l'association à rédiger par l'association :

- objectifs,
- gestion du jardin,
- ouverture régulière au public,
- activités envisagées, événements auxquels l'association souhaite participer...

(Ne pas dépasser 1 page.)

b/ L'Association a pour tâche d'organiser et de mettre en place ces activités. Elle doit en communiquer régulièrement le calendrier à la Ville de Paris.

L'Association s'engage à informer la Ville de Paris de toute période de vacance dans l'utilisation du jardin.

Article 5 **Engagements de l'Association**

a/ L'Association s'engage à assurer la gestion du jardin partagé dans le respect de la charte Main Verte. Elle porte à la connaissance de tous les utilisateurs du jardin les obligations à respecter, de la présente convention et de la charte Main Verte (panneau d'affichage mis à la disposition des associations, cahier de liaison, règlement intérieur, etc...).

b/ L'Association maintient le jardin et ses éventuels équipements en bon état d'entretien et de propreté. Toute modification importante des structures mises en place sera soumise à l'accord de la Ville de Paris.

c/ L'Association mène ses activités dans le souci de ne pas gêner le voisinage, notamment en soirée.

d/ Toutes les activités de nature commerciale et publicitaire sont interdites sans autorisation préalable de la Ville de Paris.

e/ Toute construction ou tout aménagement en dur doit être autorisé par la Ville de Paris et devra être démontable et transportable.

f/ L'accès et le stationnement de véhicules privés sur le terrain mis à disposition sont strictement interdits.

g/ Un niveau élevé de respect de l'environnement est demandé :

- interdiction absolue d'employer des produits phytosanitaires, pesticides et engrais chimiques,
- pratique du tri des déchets dans le jardin, mise en place de compostage de proximité,
- choix d'essences adaptées au sol et au climat, en évitant les plantes invasives,
- gestion économe des ressources naturelles, en particulier l'eau,
- interdiction de mener des activités susceptibles de polluer le sol.

h/ Aucun départ de feu n'est autorisé. Les élevages, sauf autorisation expresse de la Ville de Paris, sont interdits.

i/ La plantation d'arbres et d'arbustes à grand développement n'est pas autorisée.

j/ Lorsqu'une clôture est mise en place le long de la parcelle, sa transparence doit être maintenue.

k/ L'Association affiche son nom, le logo Main Verte et les modalités d'accueil du public dans le jardin.

l/ L'Association s'engage à respecter toutes les consignes de sécurité qui lui seront données par la Ville de Paris.

m/ L'Association assume la responsabilité des dommages imputables à l'utilisation qu'elle fait du jardin et des équipements mis en place par la Ville de Paris.

A ce titre, la présente convention lui confère l'obligation de se couvrir par une assurance appropriée, de tous les risques et de tous les dommages susceptibles d'être commis à l'occasion de l'exercice de son activité. Elle transmet à cet effet à la Ville de Paris les polices d'assurance qu'elle a souscrites.

n/ En cas de détérioration de l'aménagement mis en place par la Ville de Paris, l'Association a pour obligation d'en informer la Direction des Espaces Verts et de l'Environnement de la Ville de Paris.

o/ La consommation des végétaux cultivés sur le terrain se fait sous la seule responsabilité de l'association. Par mesure de précaution, la Ville de Paris engage les associations à respecter les consignes suivantes si des plantes du jardin sont consommées (légumes, aromatiques...) :

- les plantes sont soigneusement rincées à l'eau potable et épluchées si possible,
- les mains doivent être lavées au savon après toute activité de jardinage. Une attention particulière sera portée au brossage des ongles,
- le port des gants est à privilégier lors des travaux de jardinage,
- les eaux de récupération ne sont pas utilisées pour l'arrosage des plantes alimentaires et aromatiques.

p/ L'ensemble du règlement des parcs et jardins s'applique aux jardins partagés en dehors de ce qui est explicite et dérogatoire.

q/ L'Association doit supporter en durée et en occupation de terrain, la réalisation de travaux que la Ville de Paris jugera nécessaire sans pouvoir prétendre à une indemnisation sous quelque forme que ce soit.

r/ Toute manifestation ou organisation d'événement en dehors des horaires d'ouverture des espaces verts est soumise à l'autorisation de la Délégation Générale à l'Événementiel et au Protocole de la Ville de Paris.

Article 6 Ouverture du terrain :

a/ Les clefs du jardin sont remises à l'Association, après remise des documents prévus à l'article 5, alinéa m, et, si nécessaire pour le bon fonctionnement du jardin, aux personnes autorisées par la Ville de Paris.

b/ L'Association s'engage à accueillir et renseigner le public au minimum deux demi-journées par semaine dont une le samedi ou le dimanche. Ces permanences sont à déterminer collégialement au sein de l'Association et sont mentionnées par voie d'affichage à l'entrée du jardin.

c/ Dès qu'un membre de l'Association est présent sur la parcelle, le jardin partagé doit être accessible à tout public.

d/ Lorsque le jardin partagé est situé dans un espace vert de la Ville de Paris, il reste obligatoirement accessible au public aux heures d'ouverture de celui-ci.

e/ Les services techniques de la Ville de Paris (Direction des Espaces Verts et de l'Environnement) peuvent interdire l'occupation du jardin au public, pour raison de sécurité, notamment en cas de travaux d'entretien qui peuvent intervenir à tout moment de l'année, de manifestations officielles, en cas d'avis d'orage ou de tempête diffusé par Météo France ou pour tout motif d'intérêt général.

La Mairie d'Arrondissement peut intégrer la participation de l'association à un ou des événements locaux.

Article 7 Modalités financières :

Compte tenu du caractère non lucratif de l'activité de l'Association, la mise à disposition de la parcelle de terrain se fait à titre gratuit, conformément à l'article L. 2125-1 du Code général de la propriété des personnes publiques.

Cependant, conformément au plan comptable des associations et fondations, adopté le 17 décembre 1998 par le Conseil National de la Comptabilité, la valeur locative du terrain, estimée à €/an, est valorisée dans les documents comptables de l'Association.

Article 8 Correspondants de l'Association :

Les services de la Ville de Paris qui sont les correspondants et partenaires de l'Association sont les suivants :

- la Mairie du ..^{ème} arrondissement de Paris, représentée par (mail :; tél :)
- l'Agence d'Ecologie Urbaine, (« cellule Main Verte », mail : main.verte@paris.fr; tél : 01 53 46 19 19) représentée par Karina Prevost (mail : karina.prevost@paris.fr ; tél : 01 71 28 53 59)
- la division du ..^{ème} arrondissement de la Direction des Espaces Verts et de l'Environnement, représentée par (..... ; tél :) et son adjoint (..... ; tél :)

L'Association sera représentée par :

- (mail :; tél :)
- (mail : ; tél :)

La mairie d'arrondissement peut désigner des correspondants supplémentaires (correspondant communication par exemple).

Article 9 **Litiges :**

Les litiges qui pourraient survenir à l'occasion de l'exécution de la présente convention et qui ne pourraient être résolus de façon amiable seraient portés devant la juridiction administrative compétente.

Fait à Paris en double exemplaire, le

Pour l'Association,
Son Président

Pour la Ville de Paris,

[Le Maire de Paris

Le Maire du ...^{ème} arrondissement]
dûment habilité

Annexe 3. La charte « Main Verte » des jardins partagés de Paris



LA CHARTE MAIN VERTE DES JARDINS PARTAGÉS DE PARIS



En signant cette charte, l'association

s'engage :

- à une démarche participative,
- à la création de lien social,
- à jardiner dans le respect de l'environnement.

Date :

Signature :

Texte intégral de la
Charte Main verte
au verso

Pour tout renseignement :

Maison du Jardinage
Parc de Bercy
41, rue Paul-Belmondo
75012 Paris
Tél. : 01 53 46 19 19



LA CHARTE MAIN VERTE

Les principes

Démarche participative

La Ville de Paris souhaite encourager le développement de jardins collectifs s'appuyant sur une démarche de concertation et de forte implication des habitants.

La Ville soutient les jardins collectifs dans toute leur diversité, qu'il s'agisse de jardins collectifs d'habitants, de jardins pédagogiques, d'insertion, de jardins familiaux ou à but thérapeutique, dans la mesure où le jardin est le fruit d'une création collective et concertée.

La participation des habitants à la vie du jardin (plantations, fêtes, repas de quartier, expositions, projections, etc.) et à la gestion du site fait partie intégrante du projet.

Création de lien social

Un jardin partagé est un lieu de vie ouvert sur le quartier, convivial, qui favorise les rencontres entre générations et entre cultures.

Un jardin partagé contribue à valoriser les ressources locales en tissant des relations avec d'autres structures (associations de riverains, écoles, collèges et lycées, maisons de retraite, hôpitaux, centres sociaux, commerces de proximité).

Respect de l'environnement

Un jardin partagé est un terrain d'expérimentation pour des pratiques respectueuses de l'environnement. Il participe au maintien de la biodiversité en milieu urbain et au développement d'une présence végétale dans la ville, qui s'inscrit dans la démarche de développement durable initiée par la municipalité.

Des droits et des devoirs

Les jardins labellisés Main verte font partis du réseau des jardins partagés animé par la Ville de Paris. Les associations bénéficient ainsi d'échanges et de documentation, et reçoivent des informations et des conseils :

- **un accompagnement méthodologique**, qui les aide à élaborer et mettre en oeuvre leur projet.
- **une convention d'occupation et d'usage** pour les jardins qui sont situés sur le domaine foncier de la Ville de Paris.
- **une expertise technique et des conseils** sur les pratiques respectueuses de l'environnement et des éco-aménagements adaptés à Paris.
- **une animation spécifique** : cours de jardinage, trocs, lettres d'informations, conférences.

Le jardin peut être associé aux manifestations organisées par la Ville comme la Fête des Jardins.

Les engagements

Ouverture au public

- Assurée lorsque l'un des membres de l'association est présent sur le site.
- Programmée régulièrement des demi-journées par semaine, dont une de préférence le week-end.
- En permanence si le jardin partagé est situé dans un espace vert public.

Convivialité

- Organiser au moins un événement public par saison de jardinage.

Communication

- Afficher de manière visible le nom de l'association et ses coordonnées, les modalités d'accès au jardin, les activités proposées et les dates de réunion.
- Apposer le logo Main verte sur le jardin.

Fonctionnement

- Élaborer collectivement et afficher les règles de fonctionnement du jardin.

Gestion du site

- Maintenir le jardin en bon état, en veillant à la sécurité du public.
- Privilégier une gestion écologique du site (développer le compostage de proximité et la récupération des eaux de pluie, planter des essences adaptées au sol et au climat, sans recourir aux pesticides et engrais chimiques).
- Veiller à la conformité des usages avec la destination pour laquelle le jardin a été attribué (pas de stationnement de véhicules, pas d'habitation).
- Mener des activités sans causer de gêne au voisinage.

Assurance

- Contracter une assurance responsabilité civile.

Bilan

- Présenter un compte-rendu annuel d'activité.



Titre : Initiatives citoyennes de conservation de la nature en milieu urbain : rôle des jardins partagés

Mots clés : intendance environnementale, jardins partagés, sciences de la conservation, pratiques éco-citoyennes, nouvelles expériences de nature, valeurs relationnelles

Résumé : Les cadres théoriques de la conservation de la nature n'ont pas un caractère figé, mais ont évolué au cours du temps en privilégiant telles ou telles valeurs, notamment intrinsèques ou instrumentales. Or, les limites de ces cadres d'analyse pour susciter des engagements pour la nature ont été montrées. En m'appuyant sur la notion de valeurs relationnelles ainsi que sur celle des transformations des expériences de nature, j'ai conduit un travail qui veut apporter une réflexion complémentaire aux manières de concevoir la conservation de la nature. Pour cela, à travers l'étude transdisciplinaire des initiatives citoyennes de jardins partagés, cette thèse cherche à comprendre les motivations des citoyens ordinaires à s'engager pour la nature. Ce travail a notamment permis de montrer que des expériences de nature se font aussi en ville, par exemple pour combler un vide personnel par des pratiques de jardinage et des mises

en relations sociales et écologiques dans ces espaces. Ces expériences sont aussi vécues par les riverains des jardins, qui pour la plupart reconnaissent et valorisent les bienfaits de ces jardins pour eux, pour les jardiniers, pour le quartier et pour la ville. Au niveau de la biodiversité, j'ai montré que les jardins sont des endroits propices pour l'installation d'une flore spontanée, dont la richesse dépend de l'action des jardiniers et des décisions des propriétaires du terrain (notamment de laisser l'espace disponible sur un temps long). Enfin, j'ai montré comment les relations socio-écologiques créées et encouragées dans un jardin deviennent des moteurs pour l'action politique. Par tous ces angles d'approche, ce travail de thèse montre donc le rôle crucial des valeurs relationnelles dans la motivation à conserver la nature. Relations à reconnaître et valoriser dans toutes leurs diversités.

Title: Citizen initiatives for nature conservation in urban areas: the roles of community gardens

Keywords : civic-ecology practices, community gardens, conservation sciences, environmental stewardship, new experiences of nature, relational values

Abstract – Theoretical frameworks for nature conservation have evolved through time, with priority successively given to different values, instrumental or intrinsic. However, these frameworks have limits in motivating engagement towards nature. Building on the respective notions of relational values and transformation of nature experiences, my thesis work aims to fuel the reflection on new ways of considering nature conservation. I have used community gardens, a particular form of citizen initiative, as a study case to understand the motivations of ordinary citizens to engage towards nature. On the social side, I showed that experiences of nature can be gained in these gardens despite the urban environment, to fulfil personal needs through gardening and through the development of social and ecological relationships. These experiences of nature influence the neighbouring citizens of the gardens, who acknowledge their benefits for themselves, the

gardeners, the neighbourhood, and the city in general.

On the ecological side, I showed that community gardens host a rich community of spontaneous plants, which species richness depends upon gardeners' management and garden age, which in turn depends on stakeholder decisions as to the durability of community gardens.

Last, I showed how socio-ecological relationships created and promoted in a community garden can become drivers for political actions, through the particular case of one garden.

Through this combination of social and ecological approaches, this thesis highlights the crucial role played by relational values in nature conservation motivation. These relations have to be acknowledged and promoted in all their diversity.