

Institution: University of Brighton		
Unit of Assessment: D32 Art and Design: History, Practice and Theory		
Title of case study: Designing Urban Food Futures		
Period when the underpinning research was undertaken: 2001 – to date		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Andre Viljoen	Professor of Architecture	2001 – to date
Katrin Bohn	Senior Lecturer	2001 – to date
Period when the claimed impact occurred: 2013 – to date		
Is this case study continued from a case study submitted in 2014? N		
1. Summary of the impact <p>Research into the design of urban agriculture at the University of Brighton (UoB) is enabling cities in the UK, Germany and Japan to deliver resilient urban food systems. The research addressed food provision as a key challenge for urban sustainability and has influenced planning for urban agriculture as a part of green infrastructure and the legacy of major events. Nerima City, a region of Tokyo, with a population of 720,000 is testing UoB inspired designs to interconnect farmland and residential space. In Heidelberg, strategic design input by UoB researchers into the International Building Exhibition's beacon project has been incorporated into a post-event design masterplan that will redevelop urban space for sustainable future use. Research has contributed to the establishment of food policy councils in Berlin and Cologne and to developing food hubs as well as an initiative delivering organic food to 50,000 students at 275 schools in Berlin.</p>		
2. Underpinning research <p>In 1997, architects Bohn and Viljoen initiated a process of design research investigating the integration of urban agriculture into cities, leading to a large body of work underpinned by the concept of Continuous Productive Urban Landscapes (CPUL) [Reference 3.1]. CPUL is a design concept advocating the coherent introduction of interlinked productive landscapes into cities as an essential element of sustainable urban infrastructure. Central to the CPUL concept is the creation of multi-functional open urban space networks that complement and support the built environment. This strategy involves uniting existing open space and derelict sites into food-growing areas that connect city centres and communities with local farms. As well as identifying available land for cultivation in cities, CPUL aims to get people discussing food production as part of everyday urban life. The pioneering CPUL concept and related design research are now at the forefront of a global effort to design interconnected, successful, liveable and resilient cities. Research focuses on the multiple social, economic and ecological benefits realisable by developing resourceful and equitable urban food systems, and enabled by the integration of urban agriculture as part of a city's networked and productive landscape infrastructure. The 2009 London Yields urban agriculture exhibition was typical of Bohn and Viljoen's work in providing a pathway to dissemination. A review in ICON magazine describes this work as '<i>the trailblazer in British research [...] which has been chewing at the question since before our combined emergencies made it fashionable</i>' (https://www.iconeye.com/news-parent-category/review-london-yields-2 [Accessed 13th November 2020]).</p> <p>Initial research utilised quantitative and qualitative arts-based practices, exhibitions and installations to test theoretical design assumptions against realities of CPUL's environmental impact (sustainability), place (context) and perception (stakeholder critique). The originality of the research lay in identifying the potential sustainability, urban design and quality of life benefits arising from integrating food growing spaces (urban agriculture) into cities. Early research catalysed a multidisciplinary international community of practice to move the theoretical concept from the fringes of academia and practice to the mainstream public through practical implementation projects (DOTT 07 Middlesbrough, UK; Edible Andernach,</p>		

Germany; Prinzessinnengärten Berlin, Germany) and into policy discourse (Brighton, UK; Tokyo, Japan; Berlin, Germany). Bohn and Viljoen's 2005 book [3.1] gained critical recognition for the CPUL concept and endorsement from bodies such as the United Nations University, Institute for Advanced Studies, UNESCO and the Royal Institute of British Architects (RIBA). Subsequent research has been conducted to extend CPUL's multidisciplinary reach [3.2 and 3.3] through a number of experimental designs and prototypes, which move towards implementation and policy [3.4].

Between 2014 and 2016, Viljoen led an AHRC funded international network to extend the dialogue between practice-based researchers and policy makers, initiated by the observation that urban agriculture practice was outstripping policy. This work ran in parallel to another strand informing a wider cultural understanding of the CPUL concept [3.5]. Viljoen and Bohn's 2014 book *Second Nature Urban Agriculture* [3.2] won the international 2015 RIBA President's Award for Outstanding University-located Research. One of its research contributions was the four-step *CPUL City Actions* plan, a method for the long-term integration of CPUL into cities. It advocates conducting 'Inventories of Urban Capacity' (IUC), top-down and simultaneous bottom-up collaboration (U+D), visualisation for scenario building (Vis) and continual research to evaluate actions (R).

The theoretical basis for CPUL is now embedded in international design and research discourse, and Viljoen and Bohn collaborate with cities and citizens to realise the CPUL concept in practice. Ongoing work includes Viljoen's research and advice for the development of Brighton and Hove's pioneering Planning Advisory Note and Bohn's contribution to an International Building Exhibition (IBA), and Germany's most significant urban development tool (IBA Heidelberg, 2013 – 2022). Bohn's study in Heidelberg investigates the CPUL concept in relation to constraints of commercial development, working to integrate an ex-army base into the city as a sustainable urban quarter [3.4]. This research develops the urban metabolism aspects of the concept, work that is also central to Bohn's role in a current EU COST Action on circular cities. The CPUL concept in practice continues in the most recent publication [3.6], which uses urban and architectural design and the CPUL concept as a frame for exploring synergies between urban agriculture and sustainable urban development. This concept is tested through detailed case studies that consider opportunities and challenges within the German city of Heidelberg and Nerima City, Tokyo. This analysis is completed specifically through a consideration of how the 'scattered metropolis' adapts to develop design-informed strategies for urban and peri-urban agriculture through a reassessment of established agriculture [3.6].

3. References to the research

[3.1] Viljoen, A., and Bohn, K., (2005). *Continuous Productive Urban Landscapes: Designing Urban Agriculture for Sustainable Cities*, Routledge. ISBN 978-0750655439 [Quality validation: submitted as an output to RAE 2008 and translated into Chinese].

[3.2] Viljoen, A. and Bohn, K., (Eds) (2014). *Second Nature Urban Agriculture: Designing Productive Cities*. Routledge: London and New York. ISBN 9780415540582 [Quality validation: Authors awarded RIBA President's Award for Outstanding University-located Research].

[3.3] Viljoen, A. and Wiskerke J.S.C., (Eds) (2012). *Sustainable Food Planning Evolving Theory and Practice*. Wageningen: Wageningen Academic Publishers. ISBN: 978-90-8686-187-3. <https://doi.org/10.3920/978-90-8686-187-3> [Quality validation: contract in place for translation into Chinese].

[3.4] Bohn, K. and Dreiseitl, H., (2016). PHV_Vision: Die Produktive Stadt (PHV Vision: The Productive City). A feasibility study for the development of a state-of-the-art sustainable urban quarter for Heidelberg Germany [non-text output, design]. [Quality validation: a feasibility study that develops the theoretical CPUL concepts through a case-based approach].

[3.5] Bohn, K., and Viljoen, A. (2017). Food and urban design: Urban agriculture as Second Nature? In Naccarato, P., & LeBesco, K., (Eds.), *The Bloomsbury Handbook of Food and*

Popular Culture (pp. 169-183). London: Bloomsbury. ISBN: 9781474296243 [Quality validation: Chapter in peer-reviewed edited collection].

[3.6] Viljoen, A. and Bohn, K., (2020). Building continuous productive (peri-)urban landscapes. In: J Wiskerke (ed.), *Achieving Sustainable Urban Agriculture*. I (I), Cambridge, pp. 61-100. <https://doi.org/10.19103/AS.2019.0063.07> [Quality validation: Chapter in peer-reviewed edited collection].

Key research grants

Andre Viljoen [PI], 2014 – 2016. Arts and Humanities Research Council (AHRC) Research Network Award. [AH/L015781/1], 'Urban Transformations: Pathways from practice to policy'. Total funding GBP29,324.

Katrin Bohn [consultant], Consultancy contract with the City of Heidelberg, 2016 – 2017, 'PHV Next generation: Urban metabolism'. Total funding EUR20,000.

Katrin Bohn and Andre Viljoen [management committee members for the UK], (2018 – 2022). EU Cost Action Network, lead: Universität für Bodenkultur Wien, Austria. 'Circular City: Implementing nature-based solutions for creating a resourceful circular city'.

Katrin Bohn [UoB PI], 2018 – 2023. EU Horizon 2020. [776665], 'Edible Cities Network (EdiCitNet): Demonstrating innovative nature-based solutions in cities'. Total funding EUR195,997.50.

4. Details of the impact

In the last decade, urban food production and supporting policy and design initiatives have increased in importance and urgency for cities around the world. In this context, Viljoen and Bohn's pioneering CPUL concept has shaped urban design theory and discourse through an understanding of the interconnectedness of city spaces; and directly addressed practice and policy through engagement with local government bodies and citizens at sites in Europe and Japan. The CPUL concept has been credited with '*recognizing the importance of a new kind of industrial ecosystem*' (Professor of Architecture, University of Oregon) [Source 5.1]. Since 2014, the CPUL research has moved from theory into practice and now reshapes urban planning through the application of the research-based four-step *CPUL City Actions* method set out in Bohn and Viljoen's 2014 publication. By utilising the research findings and the four-step method Bohn and Viljoen are now embedded in local authority led planning as well as citizen partnerships that are applying the CPUL concept in urban design practice. Using *CPUL City Actions* as a pathway to impact, the body of research generates two related forms of impact: i) changing urban planning and the design of urban spaces; and ii) enabling the development of urban food policies by supporting the establishment of citizen groups and food policy councils.

4.1 Changing urban planning and the design of urban spaces

Viljoen's work and detailed case study analysis of specific urban sites and his published application of the CPUL theory led to involvement in Tokyo's consultation on legacy strategies for the 2020 Olympic and Paralympic games. As a consequence, he was invited to contribute to the Urban Agriculture World Summit (UAWS) in November 2019, hosted by Nerima City (Tokyo). Nerima City is only 30 minutes from central Tokyo, home to 720,000 residents, as well as 40% of Tokyo's farmland. The city is working to re-evaluate the role of this diminishing area of farmland within a broader strategy for green infrastructure. The UAWS provided an opportunity for researchers and agricultural professionals to consider the potential for urban agriculture with delegates from five international cities. Nerima City funded two trips to Tokyo (2018 and 2019) for Viljoen as an overseas expert to consult on the potential of these sites for urban agriculture. The trips enabled new field work in Tokyo which extended the CPUL research into large-scale urban agriculture. As a result of this partnership Viljoen co-designed, with the farm's owner and city planners, a proposal for retaining 4,000 square meters of urban farm by embedding the CPUL concept through the four-step *City Actions* approach. This focused on the redesign of boundaries between agricultural land and residential spaces to enhance quality of life for residents and was previewed at the UAWS. The development of the farm is currently being negotiated between the farmer and Nerima City. Further advice and

recommendations provided by Viljoen were embedded in the UAWS 2019 urban agriculture declaration. In particular, the recommendations focusing on urban agriculture as a strategy to mitigate the effects of climate change, now part of the declaration, have become a consensus statement issued by the international delegation attending the 2019 UAWS [5.2].

In Germany, the International Gardening Exhibition (IGA) and International Building Exhibition (IBA) are prestigious strategic national implementation programmes that leave long-term legacies. IGA involves large-scale horticultural shows with a permanent spatial planning aim running over five-year implementation periods. IBA is Germany's biggest architecture and urban regeneration programme focusing on international design excellence and attracting widespread international attention with each IBA running for a 10-year implementation period. Both the IGA and IBA sought strategic advice from Bohn on urban agriculture relating to individual projects and overall strategic thinking. For IGA Berlin, Bohn played an enabling role by providing advice on the challenges and benefits of introducing CPUL-like spaces into the 2017 show (which attracted approximately 1,600,000 visitors) and on how to approach implementation [5.3]. Bohn had a direct influence on the development of a 420-ha urban agriculture park during Heidelberg's IBA International Building Exhibition. Then as member of a consortium of international and world-leading architects, in 2017 Bohn co-developed and co-delivered a feasibility study on food and circular systems in Heidelberg. This formed the framework and had a direct influence on the first phase of the IBA's plans to regenerate the Patrick Henry Village (an abandoned 100-ha US-Army estate) which is situated next to the IBA urban agriculture park. Now called 'PHVision' this is described as the IBA's most significant strategic beacon project, an *'exemplary living quarter for 10,000 inhabitants and 5,000 employees'* [5.4]. The CPUL concept was used in the first phase of urban design, linking the PHVision area with the region and combines living and working spaces in a new manner; it thereby contributed to a design that will be *'fit to provide the resources of life for years to come'* [5.4]. This first phase of work was then incorporated into a design masterplan for the region around PHVision, which is currently under development and incorporates CPUL inspired urban agriculture [5.5].

4.2 Enabling the development of urban food policies and supporting the establishment of citizen groups

Collaborations enabled by Viljoen supported the identification of urban agriculture within the Brighton and Hove Food Partnership's actions and development of an internationally disseminated Planning Advice Note (PAN) adopted by Brighton and Hove Council in 2020 [5.6, 5.7]. The PAN includes an illustrative CPUL drawing by Bohn and Viljoen and cites the CPUL concept. It references this research in terms of utilising successful past initiatives as a resource for future planning. The reassessment of urban food planning is noted in the PAN as particularly pertinent at this time as the role of gardens, green spaces and the reliance on living spaces to support food resilience has become increasingly significant during the pandemic. The PAN acknowledges the benefits of food growing spaces on people's health, the positive impact of local food on the environment and the learning opportunity that growing food brings to a community [5.6].

Grass-roots collaborations co-organised by Bohn led to the creation (and formalisation) of local 'food policy councils' in Berlin and Cologne in 2015. The Food Policy Council Berlin is a grass-roots civil society alliance committed to ecological, socially-just food production and distribution in the Berlin region. As a form of research-based intervention, this alliance was instigated and co-founded by Bohn through instrumental input into Berlin's 'Food & the City Working Group', including delivering the first public presentations on the subject between 2014 and 2016. The aim of the Food Policy Council is to promote changes in the food system that affect sustainability. Bohn has drawn on CPUL research to advise on and develop information, strategies and recommendations that are communicated to state politicians to deliver change, including a regional promotion week in which the Food Policy Council provided 50,000 students from 275 schools with organic meals. Bohn worked with the Food Policy Council to establish *LebensMittelPunkte* or food hub initiatives that provide a central place for producers, gardeners, the local food industry and consumers that is now being trialled across Berlin as well as other German cities [5.8]. Since their formal establishment in

2015, the momentum has spread rapidly and now there are more than 15 food policy councils founded in Germany and a further 15 in development [5.9]. Viljoen's and Bohn's research contributed to Berlin's municipal and state governments' draft of an urban food strategy incorporating key CPUL components [5.10].

In the city of Andernach, Germany, Bohn and Viljoen's work was instrumental for the local council in a project to deliver the country's first 'edible city', which has been underway since 2010. This project enables green spaces to have new public functions, motivating citizens to engage positively with their surroundings and actively encouraging the picking of local council-supported crops. Green spaces in an 'edible city' support multiple ecological, economic and aesthetic functions. Since 2018, Bohn has continued to work with Andernach local council as it became part of the Horizon2020-funded *Edible Cities Network* as one of five pioneering 'front-runner cities' leading the work of seven international 'follower' cities. As part of this, Andernach has implemented a living lab to test further concepts and designs based on CPUL research. The Living Lab fills an area of 8000m² and focuses on the integrated roles of children and young people in the edible city. This has also led to the joint development of guidelines for all follower cities that will be implemented from 2021 [5.11].

5. Sources to corroborate the impact

[5.1] Presentation at the XXVI International Seminar on Urban Form (ISUF) 2019, by a Professor of Architecture at the University of Oregon. Evidence includes the visual presentation (including original B&V images) plus the script of the presentation which confirms the importance of the CPUL concept to understandings of urban design.

[5.2] Testimonial from the Director of the Mayor's office, Nerima City Office. This testimonial confirms Viljoen's significant contribution to UAWS and input into both new urban agriculture plans and the development of the Declaration.

[5.3] Urban Agriculture and the IGA Berlin 2017. Report available as a PDF. This report confirms the input into the IGA on the implementation of CPUL-like spaces.

[5.4] Testimonial from the Director of the IBA Heidelberg on Bohn's role as strategic adviser within IBA regeneration projects and the development of an urban agriculture park.

[5.5] KCAP. (2020). Masterplan PHVision for IBA Heidelberg becomes reality. https://www.kcap.eu/en/news/2020/masterplan_phvision_for_iba_heidelberg_becomes_reality [Accessed 18th January 2021]. This details the agreement and implementation of the PHVision Beacon project and acknowledges Bohn's intervention into the design phase.

[5.6] BHCC Brighton and Hove City Council Press Release 'Building for growing food' (2020): [Building Plans for Growing Food – Brighton and Hove Food Partnership \(bhfood.org.uk\)](https://www.bhfood.org.uk) [Accessed: 18th January 2021]. This evidences the updated planning note and the impact of the policy.

[5.7] *Planning Advisory Note PAN 06 Food Growing and Development: Updated September 2020*, Brighton: Brighton and Hove City Council. This evidences the inclusion of urban agriculture within the partnership's actions and the contribution of UoB researchers into the design thinking on pgs 5, 38 and 50.

[5.8] Testimonial from the Co-ordinator and Co-founder of the Food Policy Council, Berlin, that confirms Bohn's instrumental role in the establishment of the Council as well as the impact of its activities.

[5.9] The Food Policy Council – History and Updates: <http://ernaehrungsraete.de/ernaehrungsrat-geschichte-entwicklungen/> [Accessed on 18th January 2021]. This details the expansion of the food policy councils across Germany.

[5.10] Die Berliner Ernährungsstrategie incorporating key CPUL components: <https://www.berlin.de/sen/verbraucherschutz/aufgaben/berliner-ernaehrungsstrategie/aktionsplan/artikel.873800.php> [Accessed on 25th January 2021].

[5.11] Testimonial from the Head of the Environment and Sustainability department, Andernach Local Council. This confirms the strategic contribution by Bohn to the development of the edible city and its role in a wider context of progress towards regenerated spaces.