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Article

# Continuity and Change: Socio-Spatial Practices in Bamberg’s World Heritage Urban Horticulture

Heike Oevermann<sup>1</sup>, Daniel Keech<sup>2,\*</sup>, Marc Redepenning<sup>3</sup>, Li Fan<sup>4</sup>, and Patricia Alberth<sup>5</sup>

<sup>1</sup> Institute for Archaeology, Art History and Heritage Sciences, University of Bamberg, Germany

<sup>2</sup> Countryside and Community Research Institute, University of Gloucestershire, UK

<sup>3</sup> Institute for Geography, University of Bamberg, Germany

<sup>4</sup> Department of Urban Redevelopment and Urban Renewal, University of Kassel, Germany

<sup>5</sup> World Heritage Centre, City of Bamberg, Germany

\* Corresponding author ([dkeech@glos.ac.uk](mailto:dkeech@glos.ac.uk))

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## Abstract

The German city of Bamberg offers lessons in how continuity and change interact within the context of the inner-urban land use of commercial horticulture, thereby informing sustainable urban transformations in historic cities. The case of Bamberg shows that urban food production is not just well-established, but a consistent and centuries-old cultural structure that influences the fabric of today’s city. In this article, we discuss what forms of urban horticulture (and thus also food production) are evident from Bamberg’s past and which may prevail in the future. Two questions structure our analysis. First, how are historical sites and spatial structures of horticulture shaped in the tension between continuity and change? Second, which practices/forms of urban horticulture are taken up and how are they updated by which actors? Both the heritage and contemporary practices of urban horticulture, it is argued, can be conceived of as a resource to create sustainable places and ways of life for citizens. Two new contributions result from this work. First, the article highlights the ongoing cultural heritage dimensions of urban horticulture in a field still dominated by eco-technical contributions associated with post-industrial innovation in urban planning; in this respect, heritage should be recognised as a dynamic that shapes urban change. In addition, secondly, the application of Luhmannian concepts of evolution in social systems reinforces the interdependence of continuity and change in urban settings.

## Keywords

Bamberg; food production; Germany; heritage; urban horticulture; World Heritage

## Issue

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## 1. Introduction

Bamberg’s old town is a UNESCO World Heritage site, and a central part of the heritage comprises inner-city commercial horticulture. The number of often family-run commercial nurseries has steadily declined in recent decades. In addition, revitalisation impulses can be observed over the last decade, which is leading to changes not only in urban horticulture (UH) but in the general form of urban land use and in the perception of

the importance of public spaces. Bamberg’s urban food production is not just well-established, but a consistent and centuries-old cultural structure that influences the fabric of today’s city. Bamberg offers lessons on how continuity and change in inner-city horticulture interact to inform sustainable urban transformations in historic cities.

In this article, we discuss what forms of UH (and thus also food production) can be observed in Bamberg’s past and consider which may prevail in the future. On one

hand, this heritage is at risk due to changes in markets and consumption, for example, buying food in discount stores instead of using locally produced offers, as well as “outdated” forms of production (inner city, small-scale, hand-made food). Such contemporary practices and lifestyles also contribute to changes in the foodscapes of inner cities (Ashley et al., 2004).

On the other hand, this heritage, combined with contemporary approaches to UH, we argue, can be conceived of as a resource to create sustainable places and ways of life for citizens. In this article, the current changes in UH in Bamberg are examined in more detail, drawing on our own research, especially with regard to the preservation and updating of heritage, thereby examining how traditional urban (spatial) elements can be used innovatively.

In this context, it is noticeable that especially the common good orientation and the objective of achieving sustainability through change can provide important impulses for urban development. We pay particular attention to the interconnectedness of physical and socio-cultural forms in change itself, focusing on the challenge of being a World Heritage site.

Inner-city horticultural areas in Bamberg have remained constant in their land use over centuries, a spatial pattern protected by the Bavarian Monument Protection Act. This spatial continuity, however, corresponds with a change in the forms that UH has taken. In order to grasp this dialectic of continuity and change in cultural heritage in theoretical terms, we enrich the discussion of cultural heritage, firstly, with Niklas Luhmann’s concept of evolution in social systems to structure different rooms for manoeuvre for the actors in the UH systems and, secondly, the approach of core resources, which originates from urban sustainability research. We apply Luhmann’s ideas to explain changes in practice that have spatial consequences. We illustrate how change occurs in a variety of social and economic constellations, and how the options of individual forms of change (and their sustainability) depend on the persistence of basic spatial conditions as well as on the willingness of heterogeneous actors to cooperate. We do not seek to explain social-spatial change as a wider urban phenomenon (cf. Harvey, 1989).

Our main argument is that in spite of constraints (including the limited area within the World Heritage boundary), inherited land patterns/uses serve as core resources for conserving heritage and promoting sustainable transformations of urban societies. This is contingent on the associated urban society, as an ecosystem, forging new coalitions between civic society, market, and administrative institutions that allow for (limited) experimental innovation.

## 2. Horticulture: New Ideas or Traditional Land Use?

The relationship between the process of urban growth and the consequent changes in the area of agricultural

land and agricultural intensification is complex. In most urbanised areas, agriculture has given way to horticulture on a different spatial scale. Horticulture is an intensive form of agriculture at smaller scales, which produces non-staple food—essentially vegetables and fruits—that supply the city (Halfacre & Barden, 1979). “The closer to the city, the more agriculture assumes a horticultural mode of production, which suggests that ‘urban horticulture’ should be a useful expansion of urban agriculture terminology” (Gulinck et al., 2020, p. 136).

In recent years, UH has gained particular importance in normative discourses, for example how well-being and food justice can be integrated into urban planning (Tornaghi, 2017). Furthermore, “urban food growing can be seen as a postmodern response to socio-economic problems associated with...modernisation and related failings of neoliberal industrial urban growth” (Thornton, 2020, p. 3). Consequently, UH appears as an exciting new activity full of social potential and space-related challenges in a rapidly urbanising world. In practice, cities are fed from a diversity of sources which include urban and peri-urban areas and adjacent rural hinterlands, as well as from imports sourced via global supply chains. In the “Global North,” Opitz et al. (2015) suggest that urban agriculture, in general, is mainly led by individual, non-professionals operating in short food supply chains, or for self-provisioning. Production activities may have community-related objectives and their importance for social cohesion and the augmentation of cultural capital can be greater than their productivity (Kirwan et al., 2013). This view, however, is too restricted as it neglects commercial aspects of UH as in the case of Bamberg.

Against the backdrop of current discussions on food security, problems of global commodity chains or the Covid-19 pandemic, a renewed excitement about the potential of localised and in many cases urban food systems has arisen (Jones et al., 2022). More broadly, UH supports efforts to tackle climate change and policies have emerged to integrate health benefits with the extension of urban green infrastructure—for example, Grün in der Stadt in Germany (Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection, 2017), the Norwegian urban agriculture strategy (Norwegian Ministries, 2020), and Sustainable Development Goal 11. UH offers health and environmental benefits, examples of which have been highlighted in urban ecology (Johnson & Newton, 1992) and architecture (Viljoen et al., 2005), alongside the essentially innovative nature of urban food enterprises and community networks that produce these multiple benefits (Grivins et al., 2017; Mettepenningen et al., 2014). High expectations are being directed towards the planning profession to find ways to integrate urban development and food production, including community orchards or productive parks (Brighton & Hove City Council, 2020). The proposition of more or new forms of UH inevitably highlights land use tensions, requiring political commitment to navigate contested future urban

“foodscapes” (Moragues Faus & Morgan, 2015), as well as new tools for experimental and networked governance (for example living labs; Voytenko et al., 2016), although some critical research indicates the exclusion of socially marginalised voices in urban food-related decision-making (Brons et al., 2022).

UH remains, for all its contemporary potential to contribute to urban sustainability, an ongoing and ever-shifting facet of regional food commerce and cultural economy (Bell & Binnie, 2005). Heritage organisations play a vital role in facilitating the governance of material and intangible food heritage (Keech & Redepenning, 2020; Pearson & Pearson, 2017) and help cities continue their historical roles as locations of vibrant and evolving food cultures (Kershen, 2002).

In Bamberg, long-standing family enterprises continue to cultivate local varieties of fruits and vegetables, according to traditional techniques, and maintain the customs of a culture that has vanished from most cities. This makes an asset of intangible heritage and, therefore, UH in Bamberg was included in the German Inventory of Intangible Cultural Heritage in 2016. Together with tangible aspects, such as land, seeds, tools, and farm buildings,

the heritage value of UH that persists in many European countries has not been widely recognised. Domestic gardening, for example, helps to preserve old or rare varieties and introduces new species (Gladiš & Pistrick, 2011). In Bamberg, each family enterprise has its own collection of seeds, few of which can be purchased in the market. The closing down of a family business (e.g., through retirement) leads to the loss of unique cultivars. Bamberg’s urban gardeners have become modern citizens with changing lifestyles. Integrating UH into their daily life, they are important heritage conservationists in terms of traditional knowledge, material artefacts, and value. For them, the World Heritage designation does not necessarily freeze the dynamics of heritage. Rather, new ideas and knowledge of technical solutions, innovations in cultivation, and novel varieties have been gradually introduced.

### 3. Horticulture Within Bamberg’s World Heritage Site

UH has been practised in Bamberg since the Middle Ages. The cartographic record by Petrus Zweidler from 1602 is the city’s earliest map (Figure 1). It shows extensive,

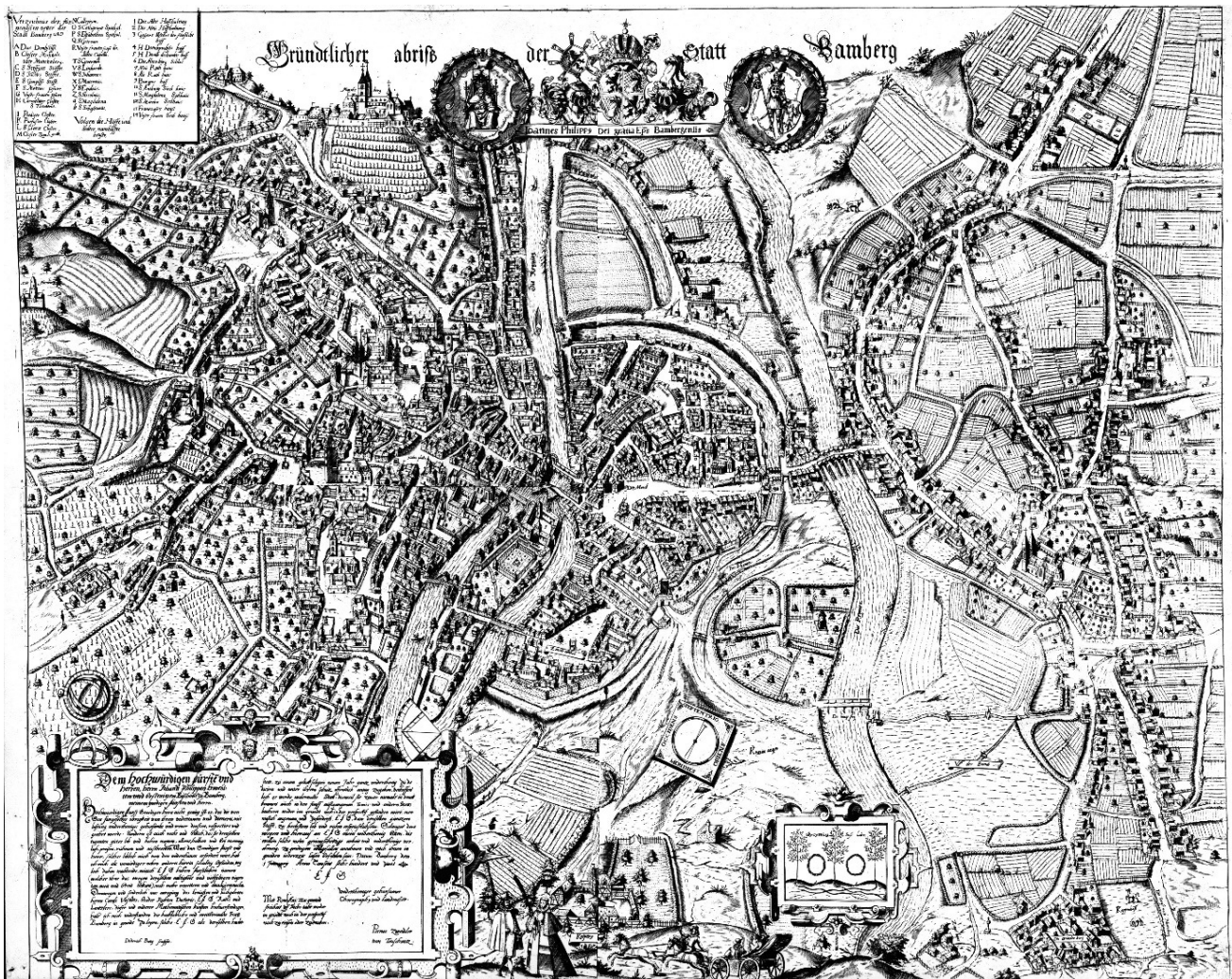


Figure 1. Map of Bamberg by Petrus Zweidler, 1602. Source: Zweidler (1602).

open horticultural spaces, which have shrunk over the centuries but continue to shape the cityscape. The cartouche, showing, for example, liquorice plants and root rings on the map, bears witness to the past economic importance of liquorice for Bamberg.

The confrontation between urban development pressure and historically rooted horticulture is a continuous one. The Town of Bamberg was inscribed on the UNESCO World Heritage List in 1993 on the basis of its medieval urban layout and its well-preserved historic buildings, mainly from the Middle Ages and the Baroque era. The World Heritage site includes the three historic districts Bergstadt (City on the Hills), Inselstadt (Island District), and the Gärtnerstadt (Market Gardeners' District) with its urban fields. Accordingly, the horticultural land is protected by the Bavarian Monument Protection Act as an essential feature of the urban ensemble. This prohibits building on historic horticultural areas, although it cannot prescribe horticultural use. In other words, losing this land to non-horticultural use or to new construction includes the risk of losing the World Heritage status (as has happened with the Dresden Elbe Valley; UNESCO World Heritage Centre, 2009).

In contrast to the importance of the urban horticultural land and its continued use for the World Heritage status, the World Heritage nomination dossier dated 1991 makes comparatively little mention of the Gärtnerstadt, which is listed as one out of a total of 48 World Heritage attributes (Schiedermeier, 1991, p. 7) as follows:

The socio-economic characteristics of the town must also be underlined, since they are of decisive importance for the town's historic appearance today: that is, the integration of agricultural areas—the commercial nursery in the valley area, and the agriculture, which evolved from wine-growing in the hillside area.

The City Council is expected to prepare a periodic report every six years on the application of the World Heritage Convention. The Gärtnerstadt was not explicitly mentioned in Bamberg's periodic report of 2006. Yet the report states that while there is adequate awareness of the World Heritage status in general among visitors, this remains minimal in relation to the Gärtnerstadt. This corresponds to results from the standardised survey conducted among tourists by the University of Bamberg (Kremer & Lehmeier, 2009, p. 70).

The situation slightly improved in 2012, when the 16th Bavarian State Horticultural Show took place in Bamberg and increased awareness about Bamberg's horticultural heritage. Moreover, €1.3 million from the national investment programme for World Heritage sites (2009–2013) were committed to the Gärtnerstadt, establishing (among other initiatives) the Interessengemeinschaft (IG) Bamberger Gärtner (interest group of Bamberg's commercial urban gardeners; see Section 6; Alberth, 2021). Nevertheless, the Gärtnerstadt

was, again, not mentioned in Bamberg's periodic report of 2013, which merely stated that the relationship between landowners and city administration leaves room for improvements. In other words, there is an ambivalent situation: The UH land and its use are essential for keeping the UNESCO World Heritage status, but civic awareness and support are limited. Consequently, commercial UH struggles due to social-spatial changes, as introduced earlier.

Bamberg's horticultural area is mostly located between the city's main train station and the old town, concentrated in two places, Untere Gärtnerrei and Obere Gärtnerrei (the lower and upper gardens). Historically, agriculture covered a much larger area. Beyond the World Heritage site, three large-scale agricultural areas had been lost in earlier waves of urbanisation. Nevertheless, since 1930, the historical gardens of the UNESCO site have remained intact, together with historical houses surrounding the gardens (Schraudner, 2021; Figure 2). The gardens have been completely enclosed by buildings and are not open to the street. The area of historical gardens has not been significantly reduced, as it has in peripheral areas, although the shapes of the gardens may have changed slightly. Effectively, as the backyards of the houses, they are private spaces belonging to individual households. The gardens are accessible only by entering the distinctive building frontages, via courtyards where produce is available for sale. The Untere Gärtnerrei and Obere Gärtnerrei are important parts of Bamberg's urban heritage, with close links to the old town in terms of food supply and social networks.

Any development of the inner-city cultivated areas would clearly jeopardise the World Heritage title. In the past, the gardens were used for self-sufficiency and/or as a source of additional income. Today, the uses are more diverse including recreation, public events, and community gardening. Accordingly, the actors have become more diverse and besides enterprise owners and trained gardeners, city dwellers have embraced UH for themselves and seek advice from professional gardeners.

Notwithstanding the importance of UH for Bamberg, commercial horticulture has declined significantly in recent decades. As an analysis of aerial photographs by the municipal urban planning office shows, Bamberg's inner-city cultivation areas, partly affecting the World Heritage site, shrank from 57 ha in 1945 to 14 ha in 2021. Around 1900, at the height of the profession, Bamberg had around 500 market gardener families (Habel, 2015). The number of businesses has dropped to between 20 and 30 businesses today. This is due to unfavourable competitive conditions linked to the spatial form of the Gärtnerstadt: There are few parking spaces, the small cultivation areas constrain mechanisation opportunities, and irrigation costs are significantly higher than they would be in the countryside. In 1962, proposals to redevelop the area to become more car-orientated would have destroyed substantial parts of the Gärtnerstadt but were eventually dropped due to public opposition.



**Figure 2.** Gärtnerstadt, Untere Gärtnerei, 2021. Source: Schraudner (2021).

However, change is needed to reinvent UH in Bamberg beyond the constraints of the World Heritage status, and in ways which retain its core resources. In applying this concept, we follow a resource approach in the field of sustainable urban planning that bridges continuity associated with conservation and change associated with development (Mieg, 2012; Oevermann & Mieg, 2016). This outlines the need to identify core resources (land, knowledge, seeds, etc.) and conserve them, while also combining them with new resources (initiatives, ideas, uses, etc.). The main pillar of the resource approach is to distinguish between core resources and their services, where the core resource is a *conditio sine qua non* for changing and varying services. Furthermore, a core resource embodies a past investment, innovation, or idea that may have experienced rises and falls, but whose value lies in its non-repeatability following changed social, economic, and political contexts or spatial environments—no new Gärtnerstadt is conceivable today. Consequently, its heritage value becomes obvious and depends on the persistence of basic spatial conditions. We argue that slight changes in land use and more radical changes in actors, organisations, and governance are key to retaining Bamberg’s horticultural her-

itage. After clarifying the theoretical implications of continuity and change, the following questions lead our deeper analysis of UH in Bamberg:

- How are historical sites and spatial structures of horticulture shaped in the tension between continuity and change?
- Which practices/forms of UH are taken up and how are they updated by which actors?

#### **4. Conceptual Framework: Continuity and Change Linked to Social-Spatial Practices of Urban Horticulture**

To understand the complexity of practices within processes of continuity and change in Bamberg’s UH arena in a theoretically coherent way, we draw on Luhmann’s (1984, 1997) social systems theory and especially his reflections on socio-cultural evolution. Luhmann’s concept of evolution is applied here to structure the diversity of ideas and practices within social-spatial change, which is helpful for understanding which new ideas and innovations are articulated, introduced, trialled, retained, and/or set aside within a particular local governance constellation.

Luhmann's understanding of evolution differs strongly from any understanding that recognises evolution as a directed and planned process of improvement (Luhmann, 1984, p. 589). On the contrary, at the heart of Luhmann's understanding of evolution is the question of how something new emerges and is then selected and subsequently approved as a new social entity following decisions within social systems (Stichweh, 2007). Luhmannian evolution comes into effect through three mechanisms (Stichweh, 2007): variation, selection, and retention (Luhmann, 1997, p. 451). In short, variation entails the production of a variant for possible further selection, for example, if given social processes are felt to be inadequate or insufficient. Variation always produces difference and thus novelty in contrast to the usual, established social practices. This difference, in turn, forces a selection: against or for the novelty which then gets tested and evaluated by a system if, for example, some advantage can be gained from such a selection. At this point, the emergence of potential (social) innovations becomes evident (Christmann et al., 2020). Consequently, once the novelty (variation) is adopted, selection leads to corresponding movements of adaptation and integration into the whole system (Luhmann, 1997, p. 451). This will produce a structural shift in the system to achieve a new state of coherence and structure, following which retention, as the third process, is finally achieved. Therefore, variation and selection denote particular events and social processes, while retention emphasises a more structural level of self-organisation when new stability within a social system is put into effect. It is important that this third function of retention is likewise the prerequisite for the introduction of new variations; hence, evolution becomes a closed loop.

Translating these ideas into empirical research, we examine different emerging (other, novel) uses of urban space through horticultural practices and forms of cultivation to indicate elements of continuity (low degree of evolution) and change (high degree of evolution). In our case, *variation* is the emergence of a new idea to practice UH on-site. However, the idea must have a social dimension, i.e., it must be discussed collaboratively among people and be tested (even if only discursively) prior to implementation. It may even have been tried out in alternative spaces in the urban fabric, for example in private gardens or more publicly inaccessible urban green spaces.

A variation subsequently experiences a (positive) *selection* when it becomes part of a socio-spatial practice that is publicly accessible. This is achieved, for example, through the formation of civic associations or networks, but also in the private sector through the establishment of a new business or the reorientation of existing businesses. Of importance in the case of Bamberg is that these selections relate to the socio-spatial practice of UH and thus continue to use the core resource of land in a new or different way.

Armin Nassehi has remarked that *retention* is only present when one can detect "lasting changes" (Nassehi,

2021, p. 69) in the structures of a larger system. Retention would be achieved when the selections are perceived and integrated into the reproduction of the system in a durable way. This may be the case if new actors become part of meetings of existing actors in horticulture, when networks and co-operations between the old and new elements of the system are established, etc. This may occur when someone takes the first step to leave an established network in order to form new networks and thereby change older networks, possibly weakening them (Boschma & Martin, 2007, p. 544), yet also contributing to the success of dynamic social and physical movements.

## 5. Research Methods

This article is informed by a diversity of map and documentary analyses and on-site interviews. In order to understand the significance of the Gärtnerstadt for Bamberg's World Heritage status, the nomination dossier of 1991 and the two periodic reports from 2006 and 2013 were also analysed.

In October 2015, two of the authors interviewed 12 people including commercial and community gardeners, city councillors and officials, members of civil society networks and food activists, brewery employees, and heritage officials. Breweries were included because they play a key role in communicating and interpreting the meanings of local food, and represent important links in local supply chains, especially around Bamberg where breweries serving food are regular clients of the urban gardeners. For all interviews, 19 identical questions were used, preceded by documentary desk research that identified demographic, administrative, and agri-food and socio-economic details drawn from municipal data sources. In October 2016, an additional workshop was hosted by the World Heritage Office, attended by 20 participants including gardeners, council and heritage officials, and civil society groups to supplement initial interview data. Data from 15 student-led interviews linked to a teaching project on Bamberg's brewing culture were separately thematically analysed by two authors, drawing out material linked to UH.

## 6. Continuity and Change in Bamberg's UH: Evolution as a Framework to Understand the Dynamics of Socio-Cultural Practices

We have chosen four examples that show the complex evolution of Bamberg's UH, addressing continuity and change. Three examples relate to newly established actor networks (Table 2); the fourth example relates to the traditional commercial gardeners' families (Table 1). They were chosen because they introduce new ideas in UH and new forms of social organisation. Thus, they make a distinctive contribution to the continuation of UH in Bamberg. Firstly, the Liquorice Society revives the tradition of growing liquorice in the city and

introduces new marketing ideas. Secondly, the heritage garden intends to preserve locally unique Bamberg vegetable varieties that have lost their market viability and are consequently no longer cultivated by commercial gardeners. Nevertheless, the preservation of these cultivars enhances bio-cultural heritage. Thirdly, the self-harvesting garden enables the continued cultivation of traditional growing spaces through novel forms of community organisation that are motivated by sustainability objectives. Fourthly, one example of commercial market gardening is introduced to illustrate the gardeners' ability to adapt to new market conditions stimulated by changing lifestyles/consumer practices. In short, our four examples illustrate entrepreneurial, bio-cultural, sustainability-gearred, and commercial engagements that stimulate social-spatial change to retain the overall structure of horticulture in the city.

As indicated, despite medieval origins and legal prescription, the commercial cultivation of the Gärtnerstadt has experienced declining gardener numbers to the extent that official concerns over its survival are expressed. To complicate matters, the gardeners do not consist of a single identity unit but are divided into two historical fraternities, mirroring parish divisions. Even today, there is strong membership allegiance to each fra-

ternity but weak cooperation between them (Keech & Redepenning, 2020) and scepticism about cooperation with "outsiders."

As described in Section 2, an important outcome from the National Investment Programme for World Heritage Sites was the IG Bamberger Gärtner, established to stimulate and consolidate closer cooperation between gardeners. The majority of Bamberg gardeners have joined the interest group. Table 1 below describes the commercial gardeners in the Gärtnerstadt and their products.

In parallel, other new actor networks (cf. IG Bamberger Gärtner, 2019, pp. 30, 37) entered Bamberg's system of UH and provided for variations and selection in the recent evolution of Bamberg's UH system, as outlined in Table 2, below.

Additional, smaller initiatives such as the Intercultural Garden have also emerged but play a subordinate role in the change of socio-spatial practices in Bamberg.

#### 6.1. Liquorice Society (*Süßholz Gesellschaft*)

The Bamberger Liquorice Society was formed in 2009 ("Süßholz-Ernte in Bamberg," 2013) to reactivate the

**Table 1.** Bamberg gardeners within the IG Bamberger Gärtner.

	Market garden	District	Product range
1	Bamberger Staudengarten Strobl	Bamberg East	Herbs, perennials
2	Gärtnerei Franz Böhmer	Gärtnerstadt	Bedding and balcony plants, floristry, grave care
3	Gärtnerei Böhmerwiese	Gärtnerstadt	Herbs, bedding and balcony plants, floristry, grave care
4	Gärtnerei Burgis	Gärtnerstadt/Bamberg East	Vegetables
5	Dechant Gartenbau	Bamberg East	Bedding and balcony plants
6	Gärtnerei & Floristik Dechant	Bamberg East	Vegetable seedlings, herbs, bedding and balcony plants, perennials
7	Gartenbau Georg Dechant	Bamberg East	Herbs, bedding and balcony plants, perennials
8	Gärtnerei Eichfelder	Bamberg East District	Vegetables, vegetable seedlings, herbs, fruit
9	Gärtnerei Emmerling/Hopfengarten	Bamberg East	Vegetables, vegetable seedlings, herbs, bedding and balcony plants
10	Blumen Hohe	Gärtnerstadt	Herbs, bedding and balcony plants, floristry
11	Gärtnerei Hohe	Gärtnerstadt	Bedding and balcony plants, grave care
12	Lurtz Gartenbaubetrieb	Bamberg East	Bedding and balcony plants
13	LUSTER GaLaBau	Am Bruderwald	Perennials, tree care
14	Mussärol Bamberger Kräutergärtnerei	Gärtnerstadt	Vegetables, vegetable seedlings, processed products
15	Gärtnerei Neubauer	Gärtnerstadt	Vegetables, fruit, bedding and balcony plants
16	Gärtnerei Sebastian Niedermaier	Gärtnerstadt	Vegetables
17	Gartenbaumschule Preller	Am Bruderwald	Bedding and balcony plants, perennials, tree care
18	Zimmers Obstgarten	City on the Hills	Vegetables, fruit, processed products, tree care

Source: Authors' work based on IG Bamberger Gärtner (2019, pp. 7–25).



**Table 2.** Actor networks introducing evolutionary processes within Bamberg’s UH.

Actor network	Founded	Objective
Liquorice Society (Süßholz Gesellschaft)	2009	Reactivation of traditional cultivation of liquorice root in Bamberg
Bamberg Heritage Garden (Bamberger Sortengarten)	2012	Cultivation/preservation of local vegetable varieties and adaptation of historical recipes for use of local vegetable varieties
Self-Harvesting Garden (Selbsterntegarten)	2016	Sustainable transformation to a post-growth format of urban society

traditional cultivation of liquorice root, since its commercial demise around the mid-1960s. Renewed cultivation was intended to restore the continuity that had existed for 500 years in Bamberg (Haupt, 1866). However, the initiative met with fundamental scepticism from established horticultural businesses because of perceived challenges in growing the plants profitably. Indeed, the continuity of cultivation could only be maintained through changed forms of production, sales, and markets on a very small scale. Land proved to be a missing core resource because, although the general availability of land around Bamberg at the time was high, landowners were doubtful about the likelihood of the initiative’s success, as illustrated by this co-founder of the Liquorice Society: “Well, the constraint is that...there is land, but the owners do not support [us], they do not want this.”

Despite this, a small quantity of liquorice was harvested and processed for local markets: The sticks of the new liquorice growth were cut and sold as a local speciality in shops targeted towards tourists, and a mint-infused liquorice tea was also produced. The Lebenshilfe, a social welfare organisation, helped arrange volunteer harvest labour, a response demanded not least because the legal form of the association is a non-profit organisation. An entrepreneur based in Southern Bavaria used processed liquorice powder as an ingredient for a Wunderburg gin, named after a district of Bamberg. Despite these challenges, the association reports that demand exceeds current supply capacity, but moves to extend production remain uncertain.

### 6.2. Bamberg Heritage Garden (Bamberger Sortengarten)

Another civil society group, the Heritage Garden, emerged in 2012, which represents a type of selected variation intended to retain UH spaces. In this case, a plot left uncultivated after the retirement of a commercial gardener was rented and became a repository for over 30 distinctive local Bamberg vegetable varieties. The Heritage Garden is cultivated by volunteers including a commercial gardener (similarly involved with the Liquorice Society) who provides the technical know-how to participants, which include local school pupils, and it has since become an important archive of Bamberg’s bio-cultural and biological material heritage within the Gärtnerstadt.

As well as cultivating unique varieties, supporters have unearthed old recipes which list them as ingredients, in order that earlier culinary uses can be revived. Stakeholders claim that the research, discovery, and communication of knowledge and attributes of historical recipes will encourage commercial gardeners to grow local vegetable varieties once again, following their decline within common use in Bamberg. One interviewee recounted: “She had the idea and asked the individual gardeners and found out that everyone had their own distinctive vegetable varieties in earlier times.”

The Heritage Garden also expresses a component of public action and public awareness-raising for local varieties. For example, the group organised public cooking classes at the Adult Education Centre (Volkshochschule) to demonstrate the possibilities of sustainable and culinary use of the World Heritage site. However, these initiatives were not stabilised, as there was no organised support from public administration actors and because the civil society commitment set narrow limits to the expansion of such activities.

### 6.3. Self-Harvesting Garden (Selbsterntegarten)

Securing urban sustainability through food production was an objective behind the establishment by Bamberg’s Transition Town group of a collaborative Self-Harvesting Garden in 2016 (Transition Bamberg, 2022). Similar to the Heritage Garden, the Self-Harvesting Garden also refers to variations and selections within commercial urban gardening, especially through cooperation with another commercial gardener. This has also posed some problems for the collaborating gardener within his own community, which is critical about his decision to cooperate with amateurs. In contrast to the two associations mentioned above, the Self-Harvesting Garden as a whole pursues a more political concern for the sustainable transformation to a post-growth format of urban society. A distinction is that the group rents currently fallow land from a commercial market gardener who (as in the earlier examples), helps to train Transition Town members, but also manages their plots for a small fee. Further support is offered by the retired manager of the Bavarian State Institute for Viticulture and Horticulture. Significantly, the Self-Harvesting Garden lies outside the World Heritage area in the peri-urban zone of the city, although there is an ambition to expand into the

Gärtnerstadt should land there become available, as suggested by a local activist:

I would like to wish explicitly for Bamberg, that the UH in the inner-city would be self-harvesting gardens, so that the potential of Bamberg in these areas is really used and that the constraints from the commercial gardeners decrease and both [approaches] inter-link because this would help to conserve the World Heritage legacy.

Connecting commercial gardeners with new civil society groups to refresh UH is a new form of social selection which clearly benefits from Bamberg's continuing horticultural tradition. Such assertions provide encouragement for the survival of diverse forms of UH in Bamberg because its distinctive socio-cultural attributes are located within the city, the ancient fabric of which is renewed and enhanced through cultivation. Challenges remain, however. The payment of fees for ground rental and technical consultancy is notable in these cases, and these types of collaborative innovations are still rare in a city where commercial actors remain ambivalent about less business-focused civil society initiatives: Food sharing is the distribution method favoured in the Self-Harvesting Garden. Even so, the expert contributions of commercial gardeners in the innovations recounted contrast with the collective notion of commercial gardeners as sceptical about bureaucracy and "green" activism, while being hamstrung in their ability to innovate by the stifling force of tradition.

#### *6.4. Variation and Selection Among the Gardener Families*

Some interviews revealed variations and selections across generations of gardener families that have been stimulated by adjustments to changes in markets (caused by new lifestyles and fashions), or by new ideas introduced by generational succession: "In the 1980s, people bought flowers like crazy. That has gone now."

Commercial competition from wholesalers and supermarkets has stimulated variations and selections including the organisation of informal equipment-sharing circles and non-food enterprises producing plant-based cosmetics and oils. This again highlights the importance of core resources and of changing services linked with them. Several nurseries switched to ornamental plants in the mid-1960s, taking advantage of a boom in decorative houseplants that lasted until the 1980s.

A product that has diminished, however, is cut flowers, which are no longer bought from specialised nurseries, but from supermarkets. The reaction to this change has been to innovate. In particular, services for grave care and general garden maintenance have expanded, as well as a service for the overwintering of exotic or Mediterranean plants, which is increasingly in demand.

Other businesses have undergone similar specialisations. For example, the following quotation reveals how, having started in vegetable gardening, a new service, the care of hydroponics is offered. This new unique selling point has attracted custom from many commercial businesses in the city of Bamberg: "My father's focus is plant production for gardens and balconies, and before that my grandpa and my father had already introduced hydro-culture as an innovation, and I have the opportunity of bringing in my own ideas now."

This innovation has given the nursery (located slightly outside the World Heritage boundary) room to manoeuvre, which the successor generation uses to offer new services, namely a pick-your-own nursery (not to be confused with the Self-Harvesting Garden in Section 6.3). In one case, diversification into multi-varietal hop cultivation and the establishment of a small brewery has proved successful. Brewed products make use of ingredients from the nursery (such as chillies, tomatoes, cucumbers, mint, etc.) and are colloquially called beers, but cannot be labelled as such, as the production violates the specifications of the Bavarian Purity Law which restricts beer to yeast, hops, malt, and water; accordingly, the term "brewing specialities" is used to describe the drinks. At the same time, small quantities of these products can be used for additional brewed and distilled specialities. On the one hand, this sets the nursery apart from the other breweries in Bamberg (of which there are 10), which brew according to the Bavarian Purity Law. On the other hand, this relationship is one of "muted" competition, because the nursery has become a hop supplier to some of these breweries.

These examples show how much change and evolution are recognised and practised by commercial gardeners. However, this evolution happens either at the level of individual enterprises or radiates towards informal agreements and co-operations between gardeners. Structural processing of these evolutionary effects to prepare retention is currently recognisable only in rudimentary ways.

To summarise, although Bamberg's horticultural heritage has, until recently, attracted limited attention in the management of World Heritage conservation, our results indicate that governance of material and intangible food heritage should be optimised (Pearson & Pearson, 2017), namely in relation to the continuities of land, knowledge, and varieties of seeds, as well as in changes in associated UH organisations, networks, and practices.

## **7. Discussion and Conclusions: Continuity and Change Understood Through Core Resources**

Generally, our findings in Bamberg confirm changes in the foodscapes of inner cities (Ashley et al., 2004) and views by Kirwan et al. (2013) and Opitz et al. (2015), who argue that UH operates within short food supply chains or for self-provisioning and production activities have multiple community-related objectives.

Importantly, Bamberg illustrates that UH is not principally a community-related objective, although these have become more prominent, but has a long-standing commercial history. The case also shows that the integration of urban development and food production is possible. In fact, in Bamberg, demands for the continued maintenance of UH land within the inner-city, framed by heritage conservation, increasingly support this integration. Due to the constraints of UH (small-scale production, low levels of mechanisation, high cost of water supply, etc.), additional changes in the social practices of UH are needed beyond the continuous patterns of holding UH land.

This article has explored the relationship between urban continuity and change. The historic gardens represent vital material components of the city's World Heritage continuity, and the social-cultural practices of gardening reveal experimental innovations, which can be understood through the three mechanisms of Luhmann's idea of evolution: variation, selection, and stabilisation. Consequently, the continuity of the historical sites and their spatial structures represent core resources (Oevermann & Mieg, 2016) in the dynamics through which UH informs intangible socio-cultural legacies.

Urban planning action, such as the support of the national investment programme that supported the establishment of the IG Bamberger Gärtner, further enabled appropriate change within the demands of the World Heritage status. The basic idea of integrating urban planning demands with those of heritage is to identify core resources (land, knowledge, seeds, etc.) and conserve them and combine them with new resources (initiatives, ideas, land uses, etc.). Without the core resources, horticultural practices cannot continue. Therefore, we see both as indicators for Luhmann's understanding of evolution, namely the continuity of core resources and the changes in use and socio-cultural practices that do not destroy the core resources.

Bamberg's UH represents a fundamental and continual spatial structure which has developed through consistent land use and is now protected as a form of heritage. The continuation of UH, as market and consumer contexts have changed, now relies on experimental and cross-sectoral (commercial, state, and civil society) cooperation to stimulate incremental and multi-functional innovations. Such innovations could become successful evolutionary practices. Luhmann's concept enables a description of the experimental processes undertaken by different constellations of social actors, united in the objective of retaining UH as an element of Bamberg's spatial and material identity. The evolutionary concept highlights that not all experiments will succeed. However, new ideas will be imagined, discussed, and trialled. It remains impossible, in Luhmann's terms, to assess the evolutionary effectiveness of the innovations, because Bamberg's UH community remains engaged in the early variation and selection stages of the process.

The analysis shows that the rediscovery of the traditional cultivation of liquorice (Süßholz Gesellschaft) and the creation of a new local market, namely the use of liquorice powder as an ingredient for gin, is one variation that is promising in regard to stabilisation, as it protects the core resource of horticultural land. It also supports the continuity of knowledge and the revitalisation of forgotten seeds/plants. Both can be understood as *conditio sine qua non* for rediscovery and creation of new markets which, in turn, are preconditions for long-term perspectives in UH production. The seed repository and new collaborations were key in the examples of the Heritage Garden and Self-Harvesting Garden that allowed the transfer and thus continuity of knowledge, seeds/plants, as well as horticultural practices, albeit under the condition of collaborative practice between new actors, institutions, and the established gardeners. Informal equipment sharing is also a new practice of collaboration between established professional gardeners. Furthermore, new products (e.g., flowers and hops) and services (e.g., events) are part of the experimental innovation that may eventually help to stabilise the overall UH environment. Here, too, evolution can be seen in enterprises that clearly occupy niches. For example, the nursery specialising in hydroponics now cultivates products (hops) that, in the final analysis, return to the original orientation of the nursery that has existed for four generations, thus introducing an innovation that returns to its roots: vegetable gardening.

The small-scale socio-spatial structure of Bamberg's UH and its protection as cultural heritage may be an advantage, by securing UH production in the long term through direct sales and marketing opportunities, and by associated social contacts which arise when patronising the courtyard stalls of the gardeners. Finally, the historical significance of the land, along with the built and open green structures, is no longer the only decisive criterion for the definition and (conservation) of the UH heritage, which now also depends on newly selected socio-cultural practices and their actors. This finding effects the practice of World Heritage monitoring that, so far, only concentrates on the tangible assets (maintaining the UH land) but not on the intangible (using the land for UH production).

It has been argued that the core resource approach clarifies the idea that continuity and change processes are both necessary in urban planning as well as for heritage conservation, highlighting the interdependence of continuity and change. The additional contribution of Luhmann in this article is to explain how processes of evolution function in practice, and how variation, selection, and retention are sequentially realised. Consequently, planners, city administrations, and conservationists will need to collaborate closely to embrace experimental innovations in the management of urban change, while anticipating future limits and processes of stabilisation, especially in regard to heritage conservation.

## Conflict of Interests

The authors declare no conflict of interests.

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## About the Authors



**Heike Oevermann** is a professor of heritage conservation with interim positions at the University of Bamberg (2021–2022) and at the Oslo School for Architecture and Design. Her background is in architecture and heritage studies and her research focus is on heritage conservation in the context of transformation.



**Daniel Keech** (PhD) is a senior research fellow at the University of Gloucestershire's Countryside and Community Research Institute. He is an urban researcher with interests in food, innovation, and cultural landscapes.



**Marc Redepenning** (Prof. Dr.) holds the Chair of Cultural Geography with a focus on social and population geography at the University of Bamberg. He is concerned with rural geographies and rural futures, the relationship between city and country, the connection between local identity and local cultures, and questions of spatial justice. His work uses methodological approaches that focus on local people, their perceptions of spaces and places, and especially their participation in development processes.



**Li Fan** (PhD) has worked both as a practitioner and a researcher in China and in Germany. She served as a heritage consultant for conservation and regeneration projects funded by national and international institutions, including United Nations Development Programme. She is a German Chancellor fellow, a DAAD (Deutscher Akademischer Austauschdienst–The German Academic Exchange Service) fellow and board member of International Association of World Heritage Professionals.



**Patricia Alberth** heads the World Heritage Office of the City of Bamberg and chairs the International Association of World Heritage Professionals.