A Transgressive Approach Towards Agritectural Space – The Idea of Agricultural-Urban Use Settlements

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Abstract: The article aims at presenting the phenomenon of transgression of the modern urban space through the formation of new spatial units defining the city in relation to its productive sphere. Due to the gradual departure from the notion of an enclosed city to one that is open and connected to the form of the surrounding countryside, the problem of defining a new notion of modern urban-rural space emerged. One of the first manifestations of this phenomenon is the emergence of new forms of housing that combine urban features with food production. Analysis of examples such as EVA-Laxmeer in Culemborg, Agromore in Almere, Cannery in Davis, Detroit and Philadelphia allowed for the verification of architectural and planning concepts related to urban values as a form of urban development of new agricultural forms. These phenomena can be understood both as a process of tearing the compact tissue of a city or, in the case of a less orthodox approach towards the built environment, as a process of network layering towards self-sufficiency of various structural, functional, energy-related and food production related characters within the unfavourable external conditions.

Keywords: agritecture, agrihood, agrarian urbanism, agropolis, zoopolia, urban farming, urban agriculture

Purpose of the research

The article presents a demonstration of the phenomenon of transgression of modern urban space through the formation of new spatial units which define the city in relation to its productive sphere. Due to the gradual departure from the notion of an enclosed city to one that is open and connected to the form of surrounding countryside, the problem emerged of defining a new term for a modern urban-rural space. One of the first manifestations of this phenomenon is the emergence of new forms of housing that combine urban features with food production. Although often critically evaluated, in some parts of the world, urban agriculture is currently one of the best and simplest ways to improve the quality of life in cities, improve access to food that is both cheap and fresh, and provide new high-quality recreation areas of an educational nature. This process is related to the clarification of some new urban planning concepts, which define the phenomena occurring in the process of transformation and in creating new housing estates.

In the current spatial situation associated with the number of transformations of urban structures, it is necessary to change the existing definition of urban productivity by considering the development of non-urban functions in urban areas. This involves a way of understanding the role of greenery in cities and a major expansion of its use as an essential element of urban composition and function.

As a consequence, it becomes necessary to define and parameterise a new urban unit which would take into account elements representing the extension of the city concept, such as urban agriculture, and the constant presence of wild nature. Therefore the research carried out is also designed to demonstrate the role of urban agriculture as an alternative to the traditional form of greenery in urbanised areas, significantly increasing its potential as a productive element that is a permanent part of the urban composition of contemporary settlements. The aim of the article is also to present new urban structures and functions in architectural and urban terms which are missing in the rich literature on the subject, to show the main principles of designing an urban settlement in which agricultural production creates a permanent element, and at the same time to demonstrate its role as the newest part of the city.

Methodology

The work was based on a case analysis of examples of housing units in the European and American cultural worlds. The selection of examples was driven by the necessity to provide a broader context and variants of the spatial forms that occur when analysing agrihood settlements. It is essential that the
various examples are fully representative to ensure a better understanding of the agrihood housing concept, to obtain an analysis of the main directions of the development of the concept, and to identify objective indicators of a new urban function. The selection of examples of agrihoods is intended to show the most representative examples of a particular settlement group, taking into account both their location and the aforementioned characteristics. An important factor in the selection of the study settlements was also their stage of implementation. The selected housing estates have been completed or are in the last stages of construction, so that they are feasible targets for analysis and for the evaluation of how the architectural and urban structures function in a wider social context. The only settlement still in the conceptual design stage is ReGen Village, but this example has been included in the study as it has the broadest range of agrihood characteristics combining living in a productive housing unit and the foundations of New Urbanism with the need to create a fully self-sufficient housing unit in every area of life. The selection of case studies makes it possible to analyse the widest spectrum of spatial forms, such as agrihood housing development, reconstruction of already existing housing complexes, construction of contemporary housing estates and designing new experimental settlements.

Tab. 1 sets out the evaluation criteria for settlement analysis. Each standard summarises the detailed characterisation that was used to evaluate the mode of functioning of each settlement and select the most representative examples from the group analysed.

Table 1 A list of agrihood housing communities worldwide and their evaluation criteria

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>architecture</th>
<th>urban structure</th>
<th>agriculture</th>
<th>community</th>
<th>environment</th>
<th>transport</th>
<th>infrastructure</th>
<th>theoretical [T]/realisation [R]</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVA-Lanxmeer</td>
<td>Culemborg, the Netherlands</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>R</td>
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<tr>
<td>ReGen Village</td>
<td>Almere, the Netherlands</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<td>+</td>
<td>+</td>
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<td>T/R</td>
</tr>
<tr>
<td>Agromere</td>
<td>Almere, the Netherlands</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>T/R</td>
</tr>
<tr>
<td>Eemstad Boerderij</td>
<td>Amersfoort, the Netherlands</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>R</td>
</tr>
<tr>
<td>Jardin d’Aqueduc</td>
<td>Paris, France</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>R</td>
</tr>
<tr>
<td>Multi-Layered City / Reinventer.Paris</td>
<td>Paris, France</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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</tr>
<tr>
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<td>T</td>
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<tr>
<td>Agritopia</td>
<td>Gilbert, Arizona, USA</td>
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<td>+</td>
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<td>+</td>
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<td>T/R</td>
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<tr>
<td>Serene Community</td>
<td>Atlanta, Georgia, USA</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>R</td>
</tr>
<tr>
<td>Prairie Crossing</td>
<td>Grayslake, Illinois, USA</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>T</td>
</tr>
<tr>
<td>South Village</td>
<td>South Burlington, Vermont, USA</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>R</td>
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<tr>
<td>Hidden Springs</td>
<td>Boise, Idaho, USA</td>
<td>+</td>
<td>+</td>
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<td>+</td>
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<tr>
<td>Willowsford</td>
<td>Loudoun County, Virginia, USA</td>
<td>+</td>
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<td>+</td>
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<td>R</td>
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<tr>
<td>Kuku’ula</td>
<td>Hawaii, USA</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>T</td>
</tr>
<tr>
<td>Bucking Horse</td>
<td>Fort Collins, Colorado, USA</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>R</td>
</tr>
<tr>
<td>Skokomish Farms</td>
<td>Puget Sound, Washington, USA</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>R</td>
</tr>
<tr>
<td>Harvest</td>
<td>Northlake, Texas, USA</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>R</td>
</tr>
<tr>
<td>Sendero</td>
<td>San Juan Capistrano, California, USA</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>T/R</td>
</tr>
<tr>
<td>Prairie Commons</td>
<td>Olathe, Kansas, USA</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>T/R</td>
</tr>
<tr>
<td>The Cannery</td>
<td>Davis, California, USA</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>R</td>
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<tr>
<td>The Michigan Urban Farming Initiative</td>
<td>Detroit, Michigan, USA</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<td>R</td>
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<tr>
<td>Grow Community</td>
<td>Bainbridge Island, Washington, USA</td>
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<td>+</td>
<td>+</td>
<td>+</td>
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<td>+</td>
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<td>R</td>
</tr>
<tr>
<td>Olivette</td>
<td>Ashville, New York, USA</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<td>+</td>
<td>+</td>
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<td>T/R</td>
</tr>
<tr>
<td>The Grow</td>
<td>Orlando, Florida, USA</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<td>R</td>
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<tr>
<td>Aberlin Springs</td>
<td>Union Township, Ohio, USA</td>
<td>+</td>
<td>+</td>
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<td>T/R</td>
</tr>
<tr>
<td>Agape Agrihood</td>
<td>Milwaukee, Wisconsin, USA</td>
<td>+</td>
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<td>T</td>
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<tr>
<td>Compassion Village</td>
<td>Santa Clara, California, USA</td>
<td>+</td>
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<tr>
<td>Self-Reliant New York</td>
<td>New York, USA</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<td>T</td>
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<tr>
<td>Nature-City / Foreclosed: Re-Housing the American Dream</td>
<td>Keizer Station, Oregon, USA</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<tr>
<td>Hyperions</td>
<td>Jaypee, India</td>
<td>+</td>
<td>+</td>
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<tr>
<td>Homefarm</td>
<td>Singapore</td>
<td>+</td>
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<td>+</td>
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<td>T</td>
</tr>
</tbody>
</table>

Source: own study based on planning data, official planning documents published in relevant council databases, information published on websites of the individual settlements and the author’s analyses. The examples analysed are highlighted in grey.
The analysis of the Dutch settlements: EVA-Laxmeer, Eemstad Boerderij, the Parisian Jardin d’Aqueduc and the ReGen Village concept, and the American examples of the Cannery, Bucking Horse and the Michigan Urban Farming Initiative led to the verification of urban and architectural concepts related to city values as a place for the development of new agricultural forms. These phenomena can be understood both as a process of tearing up the compact tissue of a city or, in the case of a less orthodox approach towards the built environment, as a process of network layering towards self-sufficiency of various structural, functional, energy-related and food production related characters within unfavourable external conditions.

The scheme based on both of these concepts is shown in Fig. 1.

![Scheme of city transformations through introducing point – and – network elements or corridors](source: own analysis)

### The beginning

Although the literature review on issues related to the functioning of urban agriculture is very wide, it does not, in fact, directly address the question of urban agriculture as a method of transforming cities and redefining urban functions in architectural and urban terms. A significant part of world research has been carried out to document the issue of the importance of this form of development in improving human welfare in many fields: economic (Hodgson, Caton Campbell & Bailkey 2011; Howe & Wheeler 1999), social (Hodgson et al. 2011), cultural (Garnett 1996; Hynes 1996; Viljoen, Bohn & Howe 2005: 56–59), educational (Klein Miller 1904: 16–30), ecological (Giseke et al. 2015a: 31–32; Henning 1999; Wiskerke 2015: 11–13), psychological and health (Danso et al. 2003; Hodgson et al. 2011; Veenhuizen 2006: 4; Viljoen & Bohn 2009: 50–60).

Studies on urban and architectural issues related to the functioning of urban agriculture have developed over the last few years. One of the first pieces of research conducted on this issue focused on the emergence and spatial expansion of urban agriculture in Western countries as an attempt to regain control over the rapid expansion of suburban housing development on areas that have so far been free from development (Wiskerke 2015: 11). The presence of urban agriculture in the Third World as a form of emergency measure aimed at improving the dramatic food shortages since the mid-70s of the twentieth century is much better documented (Bakker et al. 2000; Ellis & Sundberg 1998; Hynes 1996). On the basis of these experiences, a publication was recently published dealing with the theoretical model of transformation of the Casablanca metropolitan area into a compact layout of different forms of urban agriculture (Giseke et al. 2015b: 318–320). Although this theory can be generalised in some cases, it does not, however, take into account the case of agrihood settlement, limiting the introduction of urban agriculture in reality to being a complement to the existing urban landscape. One of the main reasons for the lack of rapid development of urban farming is the lack of readily accessible sources of information dealing not only with the farming as such, but also providing basic tools for architectural and urban planning, as well as legal planning guidelines for designers, investors and municipal authorities to plan the entire investment process related to the organisation of the urban agricultural area in close association with traditional development, as recognised by many researchers (Viljoen 1997; Viljoen et al. 2005: 62). From this point of view there are a number of important pieces of research conducted at a worldwide scale. These include a publication by G. Proksch (2017) which deals with a number of technical issues related to the design of urban agriculture and numerous examples of their implementation at an architectural scale, and work by A. Philips (2013) on the principles of the planning and design process of space associated with urban agriculture in the reality of North America.

Urban agriculture is becoming a more and more visible spatial phenomenon. It was only a matter of time before there would be an attempt to transform it into a method of redefining the city as a structure for human habitation. According to T. Deelstra and H. Girardet, properly designed and developed productive green areas in cities and urban agriculture are becoming a way of improving the comfort of living in the city, and also of establishing agricultural functions in places that for various reasons are not suitable for residential development, like most brownfields etc. (Deelstra & Girardet 2008: 48).

The role of urban agriculture is still severely limited since it remains in the private sphere, without its deliberate introduction into urban planning or agricultural policy (Hoornweg & Munro-Faure 2008). Even so (that is – even if it is solely created in a spontaneous manner) its importance to man’s wellbeing is enormous just by providing contact with nature in urban areas. As shown by a large number of examples of urban settlements combining residential and agricultural functions, this opinion is becoming obsolete to a quite significant degree. As explained by some of the research carried out, an extreme manifestation of the traditional approach towards defining the urban form of living as an attempt to reveal the superiority of man over nature is an attempt to define the origin of cities in terms of zoogeography. According to C. Philo (Philo 1995), the significant role of
animals in the historical separation of urban from rural areas was associated with man’s efforts to reduce the psycho-
logical pressure exerted by the proximity of slaughterhouses, cattle markets and so on, all linked to the biology of the life and death of animals, on the inhabitants of the area. The issue is also related to the process of forming another field of knowledge, that is, urban zoography perceived in the context of a more sublime form of urban ecology and sustainable development policy which can be implemented once a basic level of understanding is reached regarding selected physical parameters of the urban environment (Pulido 2000).

With the change of approach towards the perception of urban ecosystems as both human and wildlife habitat, there has been a chance to legitimise the introduction of additional features in urban space associated with the presence of animal and plant representatives, including the blur of the border between the historically formed scheme of the city as a pro-
vider of higher goods and the countryside as a service space for urban areas. With reference to the development of the concept of urban agriculture as a means of transforming modern urban settlements as a basic urban function, new concepts are emerging which try to define these forms of presence of nature and which connect the forms directly with housing areas.

Transgression is an interdisciplinary concept that ad-
dresses important issues in the fields of psychology, medicine, geography, and also architecture and the visual arts. Trans-gressory actions lead to one crossing certain limits, norms, and assumptions, or one’s own or imposed external bound-
aries. Transgression is also called the phenomenon of he-
reditarily determined development of certain attributes in mixed forms, rather than in the original ones, which gives rise to secondary solutions of already defined space. The idea of space transgressivity in urban planning will be related to stronger and more stable development and the greater po-
tential of areas, which is created by mixing some of the previously existing values. According to such premises, urban space being a hybrid form of urbanised and rural areas should respond to the need to create a new form of economically, ecologically and socially sustainable place to live, responding to most of the needs of modern urban man.

In the case of architecture, this concept came about for the first time in 1976 with the issue of B. Tschumi’s Transgres-
sion in Architecture (Tschumi 1976). Determining transgres-
siveness as a fundamental component of architectural ac-
tivities resulting from the need to provide a balance between constraints (legal, budgetary, spatial) and the search for archi-
tectural form makes architecture in this perspective a game of variable rules (Rice & Littlefield 2015: 2).

As homo urbanus1 strives to create an environment that reflects the realisation of the need for unfettered contact with nature free from any risks led to the revival, though in much modified form, of the idea of a sentimental connection be-
tween man and nature, which takes public form for all resi-
dents in a democratic manner, updating Ebenezer Howard’s visions of the Garden City (Howard 1902, 1946) or Frank L. Wright’s Usonia (Wright 1932). This Arcadia will not arise, however, as a denouement of nodal elements, but as an idea of transforming entire urban structures. The urban farm in Brussels, where a local breed of cows grazes with a back-
ground of contemporary and historic architecture, is no longer only a contemporary sentimental vision, but becomes a form of living image and reality in urban and suburban areas (Jégou & Carey 2016).

It is worth mentioning that the architectural and urban search for a new definition of an urban settlement in close association with various forms of urban farming or the imple-
mentation of a rural lifestyle is much older than the visions of Howard, Wright, or Hilbersheimer, but only a non-vertical agrihood settlement is the real realisation of this vision. In fact, the first visions that had the potential to be realised in the form and context of the structure were two unfinished designs of Le Corbusier from 1922 to 1925: Immeubles-villas and Cit-
téjardin, with separate deep private loggias on which crops were to grown and the park design connecting sport and cultivated areas for local residents. In 1944, just before the end of World War II, Ludwig Hilbersheimer published a project called The City in the Landscape (Hilbersheimer 1944), which in 1949 resulted in the work of the New regional pattern. In-
dustries and Gardens, Workshops and Farms, which presented a vision of a city based on a low-density urban structure con-
ected via a regional expressway system that allowed com-
munication within a large settlement.

An increasing trend for city dwellers to adapt their hous-
ing estates to their own needs has also contributed to the individualisation of solutions which define the identity of each of the teams, and the revival of the idea of idyllic settle-
ments, where living and leisure activities are connected in an active way. It also involves a significant change in the way people live and work, mainly based on mental labour.

This explains the rapid search for leisure activities that require physical and outdoor activity. Hence, settlements appear which form a village in the city – a community which, apart from housing, brings people together through physical labour, farming or cultivation. The phenomenon which is currently being observed is another example of the crossing of certain fixed cultural stereotypes and concepts that relate directly to architectural phenomena.

**Definitions**

The first element in which the transgressive phenomena in urban agriculture occur is the sudden transformation of the definition of urban agriculture into a holistic approach, which also involves the process of changing the definition of space and blurring the boundaries between the notions of urban and rural areas.

The definition by M. Poulsen and M. Spiker (2014) refers to the traditional division into urban and rural areas. Urban farming is what we call the practice of growing, processing and distributing food that occurs in or around a village, or a small, medium or large city. It may include animal husbandry, aquaculture, agroforestry, apiculture and gardening (Poulsen & Spiker 2014: 3). These definitions are also broad-
ened, describing urban production as ‘the production, pro-
cessing and distribution of food, non-food, livestock and

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1 The author of the term, J. Reumer, used it in 2011 in the book *De mierenmens – een evolutiesparadox* (Reumer 2011)
forestry in cities and suburban areas’ (Mougeot 2000). Urban agriculture, as a kind of spatial phenomenon, was defined by W. Sroka (2014: 88) and K. Ackerman (2012: 6), defining city agriculture as food production in cities, or growing and animal husbandry in and around cities.

Literature data give a division of urban agriculture referring to the approach adopted towards the issue – traditional or environmental. The generally accepted division assumes a separation based on an organisation of agriculture that promotes either of the approaches (Philips 2013: 60).

According to what is known as the traditional definition of the FAO ‘(...) urban agriculture can be defined as the growing of plants and the raising of animals for food and other uses within and around cities and towns, and related activities such as the production and delivery of inputs, processing and marketing of products.’ (Veenhuizen & Danso 2007).

The expanded form of this definition identifies urban agriculture as a branch of industry that produces, processes, and markets food and bio-fuels. It mostly corresponds to the daily demand of customers within cities and towns of all sizes and metropolises. These types of agriculture are located on land or water, dispersed throughout urban or peri-urban areas, applying intensive production methods, using or reusing natural resources and urban waste to yield a diversity of crops and livestock (Philips 2013: 48).

The environmental form of this definition is formulated by the Council for Agriculture Science and Technology (CAST), defining urban agriculture as ‘(...) a complex system encompassing a spectrum of interests, from a traditional core of activities associated with the production, processing, marketing, distribution, and consumption, to a multiplicity of other benefits and services that are less widely acknowledged and documented. (...)’ (Philips 2013: 48). These include recreation and leisure activities, economic vitality and business development, individual health and well-being, public health, landscape beautification, environmental restoration and remediation.

With a thus defined general concept of urban agriculture, there are a number of additional issues related to the specific manifestations of agriculture in the urban landscape which are directly attached to the area of human habitation.

**Agrihood**

The concept derives from the combination of two ideas – agriculture and neighbourhood, signifying both – a new social phenomenon occurring in urban residential areas and a modern trend for creating fashionable living space in cities. This type of neighbourhood unit combines a typical, mostly suburban form of development, with green areas used for cultivation and animal husbandry. Agrihood is a type of housing community that combines large-scale agricultural production with housing development, giving new meaning to the concept of mixed-use development, because it combines urban and non-urban elements. At the same time, agrihood is a commercial term used to describe housing estates built by developers as a realisation of needs of urban social cohesion through sharing leisure time spent on farming for the needs of community (Albright 2014).

Developed since the mid-1990s in the United States, this type of housing development is primarily based on developer activity and incorporates existing farms in the area, which, instead of being demolished, became part of the newly designed estates. This is a method of operation of settlements like Bucking Horse in Fort Collins, Willsford in Loudoun Country, Hidden Spring in Boise, South Village in Vermont, Prairie Commons in Olathe, and others.

**Agropolis**

This concept has its origin in the Latin phrase *ager*, which means field and the Greek *polis* – the city. In modern form, the definition was disseminated by L.J.A. Mougeot (2005) and refers to the *city of fields* and the agrarian city. It is also the name of one of the International Development Research Centre’s [IDRC] micro grants, based on the Brazilian economic integration programme launched in the 1970s and the transformation of isolated *agrovilas* into comprehensive local *agropoles*.

**Zoopolia**

The direct link between the concept of a city created by humans (*polis*) and the world of animals (*zoo*) was a long-lasting, multi-faceted process of extending the meaning of animal subjectivity in world culture, art and politics. The notion of *zoopolia* (Donaldson & Kymlicka 2011: 156–157) was originally applied to political science in the context of the space shared between humans and domestic animals, where the city was understood as a political community of its inhabitants. The term was derived from the older term of *zoopolis* created for the purposes of the build-up environment (Wolch 1998: 119–138; 2013: 233).

*Zoopolia* is a concept created by J. Wolch (Wolch & Owens 2017), as an alternative, but also complement to the concept of metropolis. It is however intended for both humans and animals, and in a broader fashion – for nature in the city. It is a further denial of the claim that there is no wildlife in urban areas. Due to the fact that the factually ‘wild’ land practically disappears, the belief that there is no wilderness in the city is causing dramatic environmental degradation (Louv 2016). This definition is based on the newly formulated design principle called non-anthropocentric design.

Although this definition does not directly relate to the issue of urban agriculture, it concerns the presence of all other forms of fauna in the environment of human life and in urban structures, which can involve both wild and domestic animals, but also farm animals, as elements of the settlements under discussion. By assuming the continued need to farm animals for meat, with the relocation of at least part of agricultural production into cities, the issue of close human and animal relationships will intensify.

**Realisation of the vision of agrihood – a productive neighbourhood unit**

The examples given are intended to show the diversity of forms of presence of agricultural areas in neighbourhood...
units in an urban environment, depending on the assumptions made and goals to be achieved in a given situation.

**Eemstad Boerderij – Amersfoort**

The example of the Dutch city of Amersfoort shows the multifaceted nature of actions in existing housing development designed to reduce the distance between humans living in a city and nature. They concern not only the design of new settlements, the process of transformation of the internal structure of existing ones, but also changes in the environment – the outer sheath of housing units. In this way the Eemstad Boerderij (Jégou & Carey 2016: 30) formed a redistribution network for food produced by urban farmers based on an almost 8-hectare farm on vacant urban lots, a form of urban wasteland, and Landwinkel stores (Jégou & Carey 2016: 32). The farm itself has a very strict production profile: 0.5 ha for potatoes, 0.25 ha for pumpkins, 1 ha for lupins, 2.5 ha for cereals and 4 ha for hay. This farm is also partially open to the public, it is possible to rent small private plots, and in addition there is a programme of collaboration with elementary schools in the neighbourhood.

These activities have been synchronised to some degree by creating a map of agricultural land in the city of Amersfoort (Jégou & Carey 2016: 64), which also provides a hint as to future locations, assuming temporary use of vacant lots within the area of a city with a compact structure.

**EVA-Lanxmeer – Culemborg**

The Dutch housing development EVA-Lanxmeer is an example of an estate that has emerged as a model project of an eco-friendly neighbourhood. Built in the years 1994–2009 on an area of 24 ha, it is an example of a straight connection between the process of designing self-sufficient development and the role of future residents in the entire process. The complex consists of 250 apartments and 40,000 sq m of office space. The Caetshage urban farm, which has been operating since 2006, covers an area of approximately 2.5 ha. It is engaged in the production of organic fruit, flowers and cattle breeding, with a particularly important role for sheep breeding. Significantly, this farm is open to the public, with separate public and trade-related and commercial functions, a small restaurant, pre-sales and a subscription system for the goods produced (Caetshage urban farm... n.d.; EVA-Lanxmeer: Results n.d.).

The EVA-Lanxmeer housing estate in Culemborg itself is an example of an Arcadian vision not only of living in a close relationship with nature, but also of an urban-rural environment. There are also wetlands and similar natural retention sites produced by the creation of artificial ponds. The housing estate has been designed in a way that limits heavy traffic within it, leaving wide spaces between buildings in the form of wild land or semi-wilderness, in order to remain in a close relationship with recreation, sports and commercial areas, playgrounds, etc. (Krawiec & Stasiak 2016). Limitation of car traffic inside the housing estate is also controlled by the proximity of the Culemborg railway station which allows easy access to workplaces in the office area. Significantly, the information centre, recreational complex, congress centre, hotel, and commercial areas were all planned, just as the area for urban farming, in a manner which limits the need for long distance transport of fresh food for the neighbourhood and gives an extra educational value.

The farm was located near the station on the north-east part of the settlement. One of the main principles of the urban development is cooperative property, unusual in Dutch conditions (EVA-Lanxmeer: Results n.d.), but here applied widely. Most of the outdoor areas are owned by the community, rather than the typical division of ownership between the individual inhabitants. This allowed the area to be to designed and developed in accordance with the needs of the whole community, publicly accessible, but also more secure, especially because of the extensive pedestrian areas and vigilant supervision of children’s playgrounds.

**ReGen Village**

In 2016 a new urban plan was published for the first self-sufficient unit – a settlement combining all of the functions of an ideal modern city in which people will co-create space while maintaining the area’s nature. The idea of a self-sufficient ReGen Village (Crocket 2016) unit by EFFEKT was presented at the Biennale of Architecture in Venice in 2016, and the first one to be implemented is to be established in the Dutch city of Almere. Starting from the assumption of the need to provide each family with the elements essential for their independence and their year-round operation, that is providing a house, food, contact with nature, energy, water, etc., the size of the unit was estimated to be about 15500 sqm. Other units, we are assured, are to be built in Norway, Sweden, Denmark and Germany.

The unit design assumes reversing the traditional urban structure of living both in spatial, economic and ecological spheres. Quoting Sinus Lynge from EFFEKT: ‘Urban dwellers across the world work hard to pay for the commodities needed for their homes, such as the mortgage, energy, water and heating, cooling and food. We envision homes that work for you, producing clean energy, water, food off the grid at affordable land prices outside our big cities.’ (Deelstra & Girardet 2008: 48).

Self-sufficiency in natural resources, food, energy and the lack of environmental impact through waste or sewage production, etc., complements the transformed housing scheme. By analogy, the settlement resembles the old castellum form, but without clearly defined external borders. The main directions of the development are, therefore, determined by its internal, network and centric relations, with the proposed architectural form of the buildings which are clearly designed by transforming the archetypal form of the house.
The outer zone of the village is created by residential housing mixed with parking spaces and infrastructure. The second ring is a zone of social activities, recreation and education, connected directly and partly mixed with farming areas. There is no urban green belt in this settlement, though it is part of each space type, both internal and external (Fig. 2).

The Cannery, Davis

American housing development located in Davis, California is one of the newest examples of a productive neighbourhood or an agrihood unit (Millenersi wola farmy... 2016). It has been designed as a mixed-use development of housing units of varying intensity and diversity. Its structure combines residential housing, a multifunctional business park and a greenbelt that links ecological corridors around the area, an agricultural buffer and an urban farm, typical recreational green areas, and a local neighbourhood centre. The entire district covers an area of approximately 40.5 ha on the outskirts of the city in the post-industrial area of the former Hunt-Wesson tomato cannery. The estate was originally occupied solely for industrial development in the industrial part of the city. Due to changes in the profile of production and employment, the area needed for industrial development has been reduced, allowing for a functional change in this part of the city (Final Environmental Impact... 2013).

The unit consists of 547 single family units and flats, and 40 accessory dwelling units in other non-residential areas. The distinctive feature of the housing structure is its diversity, manifested in variable densities, sizes, types of ownership or rental housing, as well as detached and attached housing, single- or multifamily dwellings. The southern part of the plot is about 6.10 ha of service area which creates about 650–800 jobs. Unlike the previous examples, the Cannery housing estate has also put a lot of emphasis on easy and full access to individual car communication along with large parking areas, especially in the office and mixed-use commercial district. This is furthering the realisation of the vision of American suburbanisation, known since the time of F.L. Wright’s Usonia and the Regional Pattern by L. Hilberseimer. The settlement also has an extensive layout of bicycle and pedestrian routes combined with parks and productive green spaces (Fig. 3).

Bucking Horse, Fort Collins

This housing estate, which was planned on the basis of the same ideas as the Cannery, has been completely designed and developed since 2013 as a housing estate based on the structure of three former farms, including one specialised in horse breeding (Bucking Horse n.d.). Designed for nearly 600 families², it has an expanded functional programme similar to that of the Cannery. In this case the housing areas were concentrated in the central part of the nesting layout catering for about 80 families each. The area of recreational greenery is primarily to insulate the settlement from the influence of the outer zones and from the urban agricultural area itself, which has been pushed to the peripheral parts of the plot with access to external communications. One can see a clear combination of green areas with cultivated land, creating a compact ring around the residential and commercial buildings. In the case of Bucking Horse, the commercial and office functions have been reduced to a minimum, focusing mainly on providing basic goods, and to a greater extent replaced by recreational, sporting and educational functions (Fig. 4).

Jardin d’Aqueduc, Paris

Activities aimed at improving the quality of life in housing districts through the agro-urban concept are not only associated with the development of new settlements. It also covers the transformation of existing housing complexes which no longer function properly., A process of regeneration of settlements facing the greatest social and cultural problems is taking place through the planning of vacant areas or brown fields in the immediate vicinity of these settlements for the needs of urban farming primarily serving the local community. At the same time, there is also a need to create public or semi-public urban green areas, which are very scarce in most cities. Communities of this type are being created in
The garden is an important element integrating the local, multicultural community. At present, there are 105 families gardening, and in the organised classes there are children from 11 classes from the nearby primary school which attend gardening lessons, beneficiaries of the d’Entraide Erasme Garancière Association, children from the centre for the disabled and patients from the nearby Sainte Anne Hospital (Jardin de l’Aqueduc n.d.). The traditional form of urban farming, which resembles typical social gardens or New York, Chicago, Detroit, and in the case of European cities – Paris, Brussels, Barcelona and others.

A great example of this type of spatial planning is the Parisian Jardin d’Aqueduc, a semi-public garden founded in 2004 by the inhabitants of the Sibille estate in the Alesia district of Paris on an area of approx. 1200 sq m in an area of urban wasteland alongside the railway (Histoire du jardin n.d.). The social allotment garden, in accordance with the principles of the Main Verte programme, is owned by local residents but is also used by people who do not have their own accommodation, including social and care institutions. The garden is an important element integrating the local, multicultural community. At present, there are 105 families gardening, and in the organised classes there are children from 11 classes from the nearby primary school which attend gardening lessons, beneficiaries of the d’Entraide Erasme Garancière Association, children from the centre for the disabled and patients from the nearby Sainte Anne Hospital (Jardin de l’Aqueduc n.d.).
allotments in Poland, is in this case divided into individual family plots. The green element that was a form of community renewal in this particular case builds the identity of the local community.

**The Michigan Urban Farming Initiative, Detroit**

A similar solution, however envisaged on a larger scale and also generating revenue-earning productive land in the downtown area, was proposed for Detroit as an alternative form of renewal of post-industrial areas adjacent to the historic residential development of Brush Street. Funds for the creation of urban agrihood were obtained through crowdfunding ([Crowdfunding campaign… 2017](#)). Agricultural production in the area of approx. 1.2 ha, which is based on volunteer work, is being distributed to more than 2,000 beneficiaries: neighbourhood families, schools and non-profit institutions from 2013 ([America’s First Sustainable… 2016](#)).

**Conclusions**

Although the role of urban agriculture is still severely constrained by being exclusively private, without being deliberately introduced in urban planning or agricultural policy ([Hoornweg & Munro-Faure 2008](#)), it is significant, and even if it is created purely spontaneously, it has an enormous influence on human well-being just by ensuring contact between the city and nature.

It is significant that Dutch cities are showing a lead in the development of these visions and the ecological and sustainable thinking connected with the entire philosophy of urban-rural living. It is the Netherlands for whom most of the plans, study projects or design utopias that draw attention to some of Europe’s most sensitive issues, are being created, but also for which most of these visions are being embodied. The largest of these is the building process in the
new district of Almere, in an area that was not previously there, and complementing it with a new district such as the Almere Oosterword. In the near future, it will become clear whether it is actually possible to create beauty in the housing environment by preserving the continuity of human contact with nature, symbolised by the animals and plants around which the humans will live.

The process of transgressing urban space into an agrarian vision is occurring before our eyes and is evidence of the search for a new, yet unknown, form of urban settlement. Searching for forms of the so-called New Urbanism is a need, as evidenced by a number of unfavourable phenomena occurring in contemporary housing, such as overcrowding, rising living costs, nature disconnectedness, etc. Creating a self-sufficiently urbanised housing estate can at the same time be a response to the growing problem of availability of fresh food in the city and the seeking of alternative forms of urban employment.

At the same time it is a manifestation of a certain fashion, the pursuit of originality expressed in the search for ‘alternative’ fashionable forms of residence for generations of people born around 2000. The future will show whether agrihood will become a solution to the future or just a temporary fashion.

The analysis of selected examples allowed one to assess the changes that occur in contemporary settlement structures built on the basis of the principle of linking urban housing with farmland. Linking the question of the presence of wild nature and urban agriculture with contemporary urban housing design is related to the emergence of a number of issues so far absent in the process of creating new urban and architectural structures. It should be noted that in this process the role of architect-designer as the main creator and inventor of spatial forms changes dramatically. More and more frequently, the design process brings together the model of agrihood development with the co-housing concept, participatory settlements and habitat communities.

In the process of creating a housing estate, upcoming changes mainly depend on the order in which we are familiar with typical development projects, where the initiative of plot selection and the spatial form of the design depend mainly on the developer – the initiator of the project. Changes are already taking place at the level of initial decisions. In this situation we have two procedural models. The idea of the project can be developed either initially at the virtual level, later on as a finite idea implemented in the selected location (see ReGen Village, Agromere) or related to the problem of development of a selected previously undeveloped area (see Bucking Horse). In this case, the initiators may be both future inhabitants of the settlement (Eemstad Boerderij participatory model) or leaders of the public administration (see EVA-Lanxmeer).

Agrihood settlements are not only becoming an alternative form of development that combines the benefits of urban and rural development. They create an independent residential culture, which is not available or suitable for everyone. Respect for the diversity of human needs is expressed in the form of spatial development. Different types of housing unit, in terms of size, quality and degree of association with non-urban functions, provide a nod to different degrees of integration of inhabitants and their relation to agricultural functions in the city. At the same time, agrihood, as a settlement seeking to achieve certain, at least partial independence from the external environment, also imposes a number of constraints on both its inhabitants and designers. The necessity of conducting an interdisciplinary design process that connects successive fields of knowledge and the representatives of the subsequent design industries still depends mostly on the knowledge of the designer. The characteristic elements of agrihood can be divided into seven basic groups depending on the level of the project analysed. These include the urban and architectural structure of the estate, environment, agriculture, solutions to transport problems, infrastructure, and social aspects. Each of these groups of qualities causes different forms of settlement to be included in this general form.

The main determinants of agritectural development are primarily the emphasis on the role of the estate’s aesthetics in forming its built identity, referring to the tradition of the place. The first settlements were formed around existing farms, as part of the cultural heritage of the region (Eemstad Boerderij, Prairie Crossing, the Cannery, Bucking Horse), which caused the randomness of its location in the urban structure. At the next stage, elements of the home farm were already incorporated in the design, and the location was influenced by a number of factors related to the aggregate urban tissue, physiographic and environmental conditions, etc. At the present stage of development of this idea, as yet only in the form of the conceptual principles which thus far have been the primary form of implementation, settlements are being programmed as ideal housing units fulfilling all the basic physical and social needs of their residents (ReGen Village, Agromere).

Another important issue is creating a conscious relationship between the place of residence and the natural environment by preserving the ecological continuity of habitats and the biodiversity of green areas within the settlement and linking these with the external environment. Agrihoods do not constitute an environmental barrier to wildlife. Coexistence of people and nature in the same area is caused on one hand by the usefulness of animals in maintaining the natural balance of agricultural land, and on the other – by the frequent location of buildings adjacent to natural areas or on the borders of land covered by the renaturalisation programme (Prairie Crossing, Prairie Commons, South Village, EVA-Lanxmeer). The ability to create a form of urban settlement in a quasi natural landscape often causes green areas to be kept semi-secure or restored to such a state by creating catalogues of plants that can be planted in private gardens in order to consciously stimulate nature. As a result, settlements become ecologically ‘invisible’ – their influence on changing the natural landscape is negligible. Another issue that distinguishes agrihood is the problem of promoting infrastructure solutions that combine modern technologies and systems to reduce the need for them. It is about quantitative, temporal and spatial constraints. Introducing solutions that minimise demand for external media is the basis of potential self-sufficiency and an approach to productive urban–rural housing units in so-called sustainable settlements or eco-
estates. It is characteristic of them to have their own water supply sources or a strong relationship between settlements and various types of surface water – rivers, lakes, etc., which at the same time facilitates the retention of rain water by the proper location of green areas or by introducing renewable sources of electricity as the main or sole source of power.

Restricting the use of individual cars as means of transport and promoting alternative solutions such as rail, bicycles, group transport or introducing community or shared cars aims to reduce the number of cars on the estate (in quantitative and locational terms) by reducing the number of parking places and introducing areas with limited car access.

References


