

AGRICULTURAL LANDSCAPES IN URBAN ENVIRONMENTS BY THE EXAMPLE OF CHRISTCHURCH, NEW ZEALAND

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Abstract. Agriculture has diverse forms in the intra-urban and peri-urban area of Christchurch, the capitol of the Canterbury Region, New Zealand. These agricultural landscapes are productive components of the urban green infrastructure and provide important environmental, social and economic services. Within the Reciprocal Short Term Scientific Mission supported by the European Cooperation in Science and Technology, diverse patterns of urban agriculture have been analysed according to their spatial and structural characteristics and considering their significance for building a resilient urban food system. The aim of this paper is to introduce and analyse different patterns of urban agriculture by four case studies in the intra-urban area and two case studies in the peri-urban area of Christchurch. The intra-urban agricultural landscapes are represented by the Okeover Community Garden at the University of Canterbury, the Christchurch Farmers Market at the Riccarton House, The Agropolis Urban Farm and an urban production garden. The agriculture in the peri-urban area of the city is introduced as large-scale agriculture and a specific form of urban sprawl and arable land consumption is presented by the example of lifestyle blocks.

Key words: community garden, farmers market, lifestyle block, urban agriculture, urban farm

INTRODUCTION

Agricultural landscapes stand for an important issue in contemporary landscape architecture research. The research focus varies according to diverse components or types of the agricultural landscape from vineyards [Verešová and Supuka 2013, Supuka et al.

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2011], through orchards [Paulen 2012] or other woody plants in the agricultural landscape considering their biodiversity and the landscape structure [Supuka et al. 2013]; allotment gardens in the peri-urban areas and production family gardens in the intra-urban areas of cities, towns and villages [Breuste 2010, Supuka et al. 2013, Tóth and Feriancová 2013].

A specific form of agricultural landscapes is related to urban environments and designated as urban agriculture [Lohrberg and Timpe 2011]. The contemporary research into European urban agricultural landscapes is being conducted within two running COST actions – one of them related to urban agriculture in general (COST Action TD1106 Urban Agriculture Europe) and the other one focusing on allotments as one of the urban agriculture components (COST Action TU1201 Urban Allotment Gardens in European Cities – Future, Challenges and Lessons Learned).

The peri-urban and intra-urban agricultural landscapes, their structures and dimensions have already been researched within several short term scientific missions (STSM) conducted in different European cities, metropolitan areas and regions like the Barcelona Metropolitan Region [Giacchè and Tóth 2013] or the Greater Dublin Region [Weissinger 2013].

Within the European approach, also other geographical regions and cultural contexts of urban agriculture are of particular research interest in order to gain useful information for comparison of the European cases with other situations. This might lead to a contributive knowledge transfer and thus to an improvement of the global urban agriculture research. This paper aims at introducing the results gained during the Reciprocal STSM in Christchurch, the capitol of the Canterbury Region, South Island, New Zealand [Tóth 2014].

The paper introduces six diverse patterns of urban agricultural landscapes – four of them in the intra-urban area of the city and two cases in the peri-urban area of the city. Within the intra-urban area, we deal with a family production garden, a community garden, an urban farm and a farmers market in a historic garden. Within the peri-urban area, we present two very different cases in terms of agricultural activity – farmlands and lifestyle blocks in order to compare different urban situations – 1) where the agriculture is still the main land use and 2) where the farmlands have been overtaken by suburbanization and urban sprawl.

MATERIAL AND METHODS

The Research Context – Agriculture in New Zealand and the Canterbury Region

The agricultural landscape of New Zealand is dominated by large scale agricultural systems. Historically, agriculture within New Zealand was motivated to provide for the industrialising mother country, under the British colonial rule [Rosin 2013]. This ethos of large scale production has continued, and is evident in the landscape of intensive agriculture that covers 43.2% of New Zealand [The World Bank, state 2011]. Christchurch is the third largest city in New Zealand, with 341,469 inhabitants [Statistics New Zealand, 2013 Census of Population and Dwellings], and is situated at the edge of one of the largest agricultural areas in New Zealand, the Canterbury Plains. Agricultural area covers more than 60% of the Canterbury Region (2,801,462 ha), where the highest shares are covered

by grasslands (41%) and pastures (40%). Grain, seed and crop lands have a significantly lower share (9%) and the rest 10% is covered by other agricultural land uses [Statistics New Zealand, June 30, 2012]. The agricultural production is predominantly (according to Statistics New Zealand, as at June 30 2012) livestock in numbers, grain, seed and crops in tons and hectares harvested; sheep (5,348,010); dairy cattle (1,200,293); beef cattle (470,000); grain, seed and crop land (240,656 ha; 1,070,533 t). According to numbers, sheep are the predominant livestock, however, in the last 10 years there has been a large number of sheep and mixed cropping farms converted to dairying, with an increased area under irrigation [Dynes et al. 2010].

The Christchurch Case Study

We have selected Christchurch as a case study to introduce urban agricultural landscapes in the context of New Zealand. In order to provide a complex image of the urban agriculture diversity integrated in the urban structure of the city, we have selected 6 patterns in Christchurch. These patterns, which will be discussed in detail in the results and discussion, are:

1. The Okeover Community Garden.
2. The Christchurch Farmers' Market at the Riccarton House.
3. The Agropolis Urban Farm.
4. An urban production garden.
5. Large-scale agriculture around the city.
6. Lifestyle blocks.

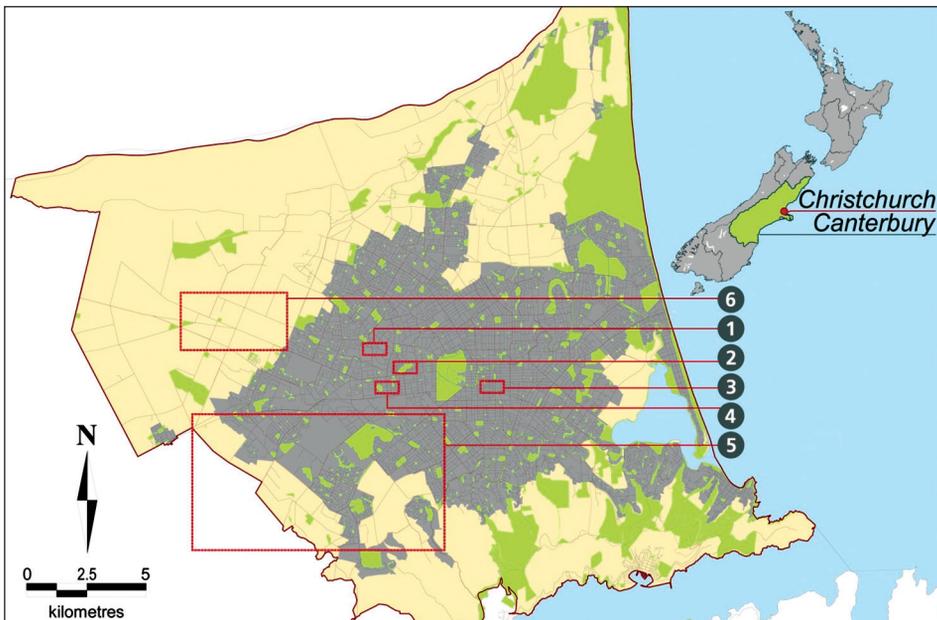


Fig. 1. Location of the Canterbury Region and Christchurch within New Zealand, location of the selected patterns of urban agriculture in relation to the urban area of the city [Tóth 2014]

Research Methods

The methodology includes literature review on urban agriculture and resilient urban food systems, which was followed by field research consisting of several field trips in order to document and map the selected patterns of urban agriculture in Christchurch. According to the COST-Action UAE Working Group 4 Methodology, we have been focusing on spatial characteristics, atmospheres and uses which take place in each of the patterns, considering their role in the process of building resilient urban food systems.

The review on the research context represented by agriculture in the country and region is based on statistical data gained from the electronic statistical sources and databases listed in the references. The analysis of spatial characteristics of the selected patterns has been conducted using maps and aerial views. The atmospheres and uses have been determined by field research including observations, surveys and interviews.

RESULTS AND DISCUSSION

The results consist of a collection of diverse forms, types and aspects of urban agriculture in Christchurch represented by the six patterns of urban agriculture. These patterns introduce urban agriculture in New Zealand conditions. The contribution of our results consists in providing examples and information of urban agriculture with a different cultural and geographic background for a qualitative comparison with European cases which can result in creating and transferring new knowledge. In the following paragraphs, we introduce each of the six patterns of urban agriculture in Christchurch.

The Okeover Community Garden

The Okeover Community Garden has been established at the University of Canterbury in 2002. It aims at being a creative and relaxing place on the university campus providing a space for free time out from work and study. The garden links two main functions: food production with social issues like education, community interaction, strengthening the sense of community and other social benefits. Permaculture and organic growing methods are applied in the garden, using no pesticides or chemical fertilisers. The emphasis of growing methods is put on creating a self-supporting ecosystem, using natural processes. The community garden is mainly used by students, but also university staff and neighbouring residents. It is also open to anyone, who wants to wander through the garden and there is a possibility of getting more involved through gardening or meeting other users and learning new things about gardening. Volunteers get to take home their share of the fresh produce collected that day. This form of urban farming does not require any previous gardening experience as the focus is more on social issues [University of Canterbury 2014]. The community garden is situated within the university campus and thus the urban fabric of the city. However, the garden space is framed by higher woody vegetation which encloses the garden and the urban context is less perceptible, see following figure.



Fig. 2. View of the community garden inner structure. The garden space is enclosed by higher woody vegetation. In the rear part of the garden, there is a small orchard. The central part of the garden is intensively covered by small vegetable plots [Tóth 2014]

The Christchurch Farmers' Market at the Riccarton House

Farmers' markets represent a common form of retail markets in New Zealand where producers sell their products directly to consumers. Recently, they have experienced a rapid growth and diffusion in many parts of the world, including New Zealand, becoming popular sites of small retail trade and local cultural exchange [Murphy 2011]. At these markets, the social dimension is at least as significant as the primary economic function of food supply. Farmers' markets are an important component of urban inhabitants' lifestyle as they provide direct social interaction between food producers and consumers. Consumers know where their food comes from. A farmers' market stands for an attractive Saturday morning social event with a unique atmosphere, live music, fresh products and the opportunity to get to know local growers and farmers, bakers, winemakers and brewers and to gain more information about their products. Farmers' markets provide also a gathering space or meeting point for local residents. An important factor of the attractiveness of farmers' markets for consumers is also a lower average price than in supermarkets. According to Murphy [2011] the product quality is the key motivation factor for customers preferring farmers' markets, while prices do not appear to be significant barriers to purchase or visits at farmers' markets. The following figure shows the atmosphere of the Christchurch Farmers' Market on a Saturday morning, when the historic site of the Riccarton House and Garden converts to a more vivid and busy space hosting the farmers' market as a local social event.



Fig. 3. The framers' market revives the historic garden space at the Riccarton House every Saturday morning [Tóth 2014]

The Agropolis Urban Farm

The Agropolis is a scalable transitional urban farm situated within the inner city of Christchurch and run by the Garden City 2.0 social enterprise which focuses on growing a more resilient local food system by developing food initiatives. The farm involves composting organic waste from inner city hospitality businesses as well as the ground preparation, sowing and planting, harvesting, cooking and distribution of the produce. It also tests questions about the city's food resilience, land use, food production and distribution in relation to the planning of the city. In the context of the long process of rebuilding the central city of Christchurch, the farm aims at testing the potential for urban agriculture as a significant component of the urban landscape and local food systems. Agropolis is part of a wider movement within Christchurch dedicated to empowering the wider community to address food security via accessible and sustainable food production and distribution. As a transitional project, it desires to harness the community's craving to be involved in growing their own food and also helping advance the sustainability of their city. Agropolis is a collaborative community project driven by a steering committee whose members include representatives from different organisations (Garden City 2.0, 2014). The following figure shows the spatial atmosphere of the urban farm in the context of the post-earthquake urban structure of the city using vacant land for agricultural production in small vegetable plots.



Fig. 4. Intra-urban public vegetable plots of the Agropolis Urban Farm reviving a post-earthquake empty space in the city centre of Christchurch. The farm provides a public space for social interaction and serves as an urban design and revival tool dealing with a post-earthquake intra-urban empty space situation [Tóth 2014]

An urban production garden

In order to present the smallest scale of urban agriculture at the local level, we have selected and analysed an urban production garden in Christchurch. Production gardens at family houses in the urban structure of the city stand for basic components of a resilient urban food system as they provide a direct link between the first and the last node of the food system – the Growers and the Consumers. Therefore, private production gardens have a great potential to contribute to building food resilience in sustainable urban environments. The presented urban garden provides a range of diverse products for the growers/consumers. These products range from seasonal vegetable grown around the house and in the backyard, through vine grown on the fence up to diverse fruit tree and shrub species all over the garden. Besides food growing, there is an interesting approach to improve the household's resilience by growing own fuel wood in the peripheral parts of the garden along the fences which intensifies the utilisation of the garden space and provides besides own food also non-food resources. In the central parts of the backyard, there are lawns which can be understood as a reserve land to intensify the food production in case of need. The household applies on-site composting to recycle the bio waste from the garden. The garden products improve the self-reliance of the household and lower food costs.



Fig. 5. The backyard of a family house with lawns in the central parts and fruit trees, vegetable plots and trees for fuel wood in the peripheral parts and along the land boundaries [Tóth 2014]

Large-scale agriculture around the city

The large-scale agriculture around the city of Christchurch is dominated mainly by livestock farming on grasslands and grazing lands, while arable land covers a significantly lower share of the overall agricultural areas. The majority of the agriculturally used land is situated to the west and north of the urban area. These agricultural areas within the administrative territory of the city represent a transition from the urban area to the open agricultural land on the Canterbury Plains. At the Christchurch City territorial authority, there are 93 140 hectares of agricultural land. From these, grasslands cover the largest area (58%), followed by grazing lands (19%). Grain, seed and fodder crop land covers only 3% and horticultural land only 0.9% [Statistics New Zealand June 30, 2012]. The following figure shows the spatial organisation of a typical livestock farm within the administrative territory of Christchurch, usually consisting of extensive grasslands or grazing lands, spatially divided by shelterbelts. Concerning the high share of grasslands and grazing lands and the number of livestock farms, these are significant features of the cultural landscape character at the capital of the Canterbury Region. Large-scale agriculture usually includes all nodes of the food system from Growers through Processing, Distribution and Market up to Consumers. Within Processing and Distribution, there might be also multiple internal links which make the food system more complex and depending on many factors, nodes and links which lowers the overall resilience of the system.



Fig. 6. Cattle breeding at the Christchurch city area. The farmland consists of large grazing areas subdivided and surrounded by shelterbelts [Tóth 2014]

Lifestyle blocks

In terms of food resilience, lifestyle blocks can be considered as a negative example representing an expansion of housing development onto the high-class arable land. The Land Information New Zealand [LINZ 2010] defines lifestyle blocks as a land generally in a rural area with a predominant residential use. The area of these blocks is variable, although it must be larger than an ordinary allotment. Their principal use is non-economic compared to traditional farming and the land price exceeds the price of a comparable farmland. According to Andrew and Dymond [2012], there are 175,000 lifestyle blocks (small rural properties with an area around 4 ha) in New Zealand covering 873,000 ha which means approximately 10% of high-class land and an increase by 75,000 since 1998. Lifestyle blocks and other forms of urban sprawl cause a significant consumption of current or future farmland. The number of lifestyle properties (with an area below 40 ha) has since 1998 to 2011 increased from just over 100,000 to about 175,000. Approximately 32% of New Zealand lifestyle-block parcels are in the South Island covering 328,000 ha. Lifestyle blocks cover an approximately four times larger area than urban areas [Terralink, state 2011], i.e. that they represent a significant form of urban sprawl consuming valuable arable lands around the city, which thereby lose their productivity. Swaffield [2012] defines three types of urbanization in the peri-urban area: rural subdivision into smallholdings; expansion of small townships; and development of private subdivisions. He states that the average farm size has decreased. Smallholdings

(from 1 to 10 ha) have changed the landscape character and dominate the peri-urban area of Christchurch. The following figure shows a typical example of a lifestyle block at the peri-urban fringe of the city, on a former farmland, where there is no agricultural production and the largest part of the land is covered by lawn.



Fig. 7. A typical lifestyle block with a relatively large family seat surrounded by ornamental plants and an extensive lawn. The high-quality land is not used for growing own food or other farming activities at all

DISCUSSION

The importance of the results consists in their contribution to the European research approach within the COST Action TD1106 Urban Agriculture Europe, as the paper introduces diverse forms and components of urban agriculture in the context of New Zealand which is interesting to compare with the European context to create and transfer new knowledge in urban agriculture and resilient food systems. Compared to the STSM conducted in the Barcelona Metropolitan Region [Giacchè and Tóth 2013], we have analysed more case studies (in this paper patterns of urban agriculture). In the research project, the food system has been much more emphasised than in the Barcelona cases. The character of urban gardens in Christchurch differs from those European ones. While in the Barcelona case study, urban gardens occur mostly in the form of informal/occupied community gardens (squat farms or guerrilla gardens) or managed urban community gardens [Giacchè and Tóth 2013], most of the urban gardens in Christchurch occur in the form of family gardens and backyards, which are represented by one of

the selected patterns of urban agriculture. However, there are also some community gardens in Christchurch, represented by the first presented pattern – the Okeover Community Garden. In some European cities this form of urban agriculture does not really occur [Supuka et al. 2013b]. Allotments which stand for a relatively common form of urban agriculture in Europe [Breuste 2010, Tóth and Feriancová 2013], do not occur in Christchurch or other New Zealand cities, as their urban structure is different and allows in most of the cases a backyard at the family house. Regarding its structure, the Agropolis Urban Farm could be compared to some of the community gardens in Barcelona [Giacchè and Tóth 2013], although their origin and the spatial context differ. If we compare New Zealand family backyards with those European ones [Bihuňová and Kubišta 2007], we arrive at the conclusion that there is a similar trend in using the family gardens and backyards for recreational purposes, although the selected urban production garden pattern confirms that there is also another approach aiming at food-self-supply of households which agrees with the findings of Tóth and Feriancová [2013]. Concerning the farmland structure and the production type, the large-scale agriculture around Christchurch differs in two basic attributes from the Central European cases [Supuka et al. 2013a] – 1) there is a higher occurrence of shelterbelts and other types of non-forest woody vegetation on New Zealand farmlands; 2) the dominant form of agriculture around Christchurch is animal farming, while crop farming has a much lower share than in Europe. The analysed lifestyle blocks around Christchurch stand for a specific form of suburbanization and urban sprawling on high-quality farmland, which agrees with the findings of Andrew and Dymond [2013]. If we compare this form of suburbanization with the ongoing sprawling processes in Central Europe [Štěpánková and Bihuňová 2013], we arrive at the statement that it differs in the spatial structures, forms and extents, but the problems caused are still similar, e.g. the conflict with farmland preservation.

SUMMARY

This paper deals with agricultural landscapes in the intra-urban and peri-urban area of Christchurch, the capitol of the Canterbury Region, South Island and introduces thereby urban agriculture and agricultural landscapes in the New Zealand context. The results are represented in the form of selected patterns of urban agriculture – four in the intra-urban area and two in the peri-urban area. The intra-urban patterns are 1) the Okeover Community Garden, 2) the Christchurch Farmers' Market at the Riccarton House, 3) the Agropolis Urban Farm and 4) an urban production garden. Thus, diverse forms of intra-urban agriculture are presented – a community garden, a farmers' market, an urban farm and a family production garden. The peri-urban agricultural landscape of Christchurch is presented by two very different case studies. One of them introduces a typical farmland at the urban fringe by the 5) large-scale agriculture pattern and the other one focuses more on the ongoing suburbanization and urban sprawling onto high-quality farmland in the form of 6) lifestyle blocks. Within the discussion, we compare our findings with urban agriculture in Europe, using the Barcelona case study. We define the similarities and differences between community gardens, urban farms,

family gardens, farmlands, suburbanization, urban sprawl and agricultural landscapes in the New Zealand and European context. The aim of these comparisons is creating and transferring new knowledge within the global landscape architecture and urban agriculture research.

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Electronic statistical sources and databases:

- The Land Information New Zealand, LINZ, <http://www.linz.govt.nz/>.
- Statistics New Zealand, <http://www.stats.govt.nz/>.
- Terralink International: New Zealand's trusted source for land and property information, spatial data services and geospatial solutions, <http://www.terralink.co.nz/>.
- The World Bank: Data and Research, <http://data.worldbank.org/>.

KRAJOBRAZY ROLNICZE W ŚRODOWISKU MIEJSKIM NA PRZYKŁADZIE CHRISTCHURCH W NOWEJ ZELANDII

Streszczenie. Rolnictwo przyjmuje rozmaite formy w wewnątrzmijskich i podmiejskich okolicach miasta Christchurch, stolicy regionu Canterbury w Nowej Zelandii. Te rolnicze krajobrazy stanowią produktywne składowe zielonej infrastruktury miejskiej oraz zapewniają ważne środowiskowe, społeczne i ekonomiczne usługi. W trakcie Obustronnej Krótkoterminowej Misji Naukowej, realizowanej w ramach Współpracy Europejską w Nauce i Technologii, badano różnorakie modele rolnictwa miejskiego zgodnie z ich przestrzennymi i strukturalnymi właściwościami, rozważając ich znaczenie w budowie prężnie działającego miejskiego systemu żywnościowego. Celem niniejszej pracy była charakterystyka i analiza modeli rolnictwa miejskiego na podstawie czterech przykładów w obszarach wewnątrzmijskich oraz dwóch w okolicach podmiejskich Christchurch. Wewnątrzmijskie krajobrazy rolnicze są reprezentowane przez Ogród Komunalny Okeover na Uniwersytecie Canterbury, Rynek Rolny Christchurch w Riccarton House, Gospodarstwo Miejskie Agropolis oraz ogród produkcji miejskiej. Rolnictwo na obszarach podmiejskich jest prowadzone jako rolnictwo na dużą skalę, a szczególnie forma miejskiej zabudowy rozproszony oraz zużycie ziemi ornej jest przedstawione jako przykład *lifestyle block*.

Słowa kluczowe: ogród komunalny, rynek rolników, *lifestyle block*, rolnictwo miejskie, gospodarstwo miejskie

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