Urban Agriculture: How to Create a Natural Connection between the Urban and Rural Environment in Almere Oosterwold (NL)

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1 ABSTRACT

Growing concerns about food prices, food security and the sustainability of the contemporary agri-food system reluctantly places food worldwide on the agendas of the authorities. It is emphasised that a re-integration of food(-production) in the urban system could mutually contribute to the sustainability of cities and agriculture. In highly urbanised countries like The Netherlands food production is a nearly exclusive rural issue, leading to a sharp boundary between the rural and urban environment. Is it possible to re-integrate agriculture, food production, in the urban system and if so what wil be the added value and how can it sustain in an urban environment?

We introduce the Dutch city of Almere, a fast growing city with 190,000 inhabitants 30 km Northeast of Amsterdam. Part of the cities' expansion plans is the transformation of approximately 4,000 ha polder area into a rural-urban fringe with a fixed amount of urban agriculture (50 %), housing (30 %), infrastructure and ditches and public green (20 %). This transformation should occur over the next 20 years through so called organic urban growth in which future inhabitants are evoked to create their own house, estate, neighbourhood, urban farm or enterprise. The development strategy titled "Almere Oosterwold: Estate for Initiatives" is a revolution in Dutch urban planning as it steps away from the current governmental dictate and top down planning. Almere Oosterwold is also a revolution in Dutch urban planning because of the pivotal position of food production -urban agriculture- in the plan. The idea is that world market oriented agriculture in the polder will alternate over the next 20 years to urban oriented agriculture.

We were challenged by the municipality of Almere to support them with elaborating strategies for the development of urban agriculture in Almere Oosterwold. We started with distinguishing the potential features of future urban agriculture in this area. Then these potential features were compared to current urban agricultural initiatives and enterprises in the Netherlands, leading to 12 types of urban agriculture. Subsequently, these 12 types of urban agriculture were detailed in requirements for development, like minimum size, needed infrastructure and legislation. Then we explored the opportunities and threats of developing these types in a rural-urban setting like Almere Oosterwold. Finally, the challenge was rendered to the municipality in a recommendation in which, zoning, pioneering and connecting were highlighted as the key elements of the development of urban agriculture in this area.

In the zoning strategy it crucial to prevent the change of land from urban agricultural use towards other uses, because urban agriculture is still an economically weaker function than housing, recreation or industry. Developing a trust in which the urban agricultural land is accommodated could be a strategy to prevent agricultural land to future urban sprawl. Because of the pivotal role of the urban agriculture on one hand and the lack of familiarity with it on the other hand, it is advised to provide pioneers with free space to experiment and improve. To coordinate and facilitate this free space the municipality should appoint an area manager. The access to the process of experimenting and improving provides the area manager (and the municipality) with new instruments (and rules) which support to conduct the development of this area. The pioneer space also can inspire newcomers. The transition of the environment subsequently will follow the path of both zoning and pioneering. Essential is that Almere Oosterwold from its foundation inextricably is connected to the city, physically as well as mentally, through infrastructure, and produce stream, and in the communication. This not only will be a responsibility of the municipality but of all stakeholders in the area.

2 INTRODUCTION

2.1 Urbanisation and agriculture; from distinct poles towards a re-union

In a highly urbanised country like The Netherlands there is a tendency towards a sharp delineation between the urban and rural environments. To some extent this sharp delineation has been the result of a strict (post

WWII) zoning policy (Koomen et al., 2008). The goal of this policy is to keep the landscape open and undeveloped, to limit travel distance and to support amenities (Van Remmen and van der Burg, 2008). This policy is fuelled by the fact that The Netherlands have to handle a relatively heavy urbanisation pressure; on the 3,4 million ha land, nearly 17 million people dwell, work, recreate and commute. The strict zoning policy has led to scarce space to develop which resulted in large price differences between land designated for housing, recreation or infrastructure and land designated for nature conservation or agricultural purposes (Cotteleer et al., 2007). As a consequence, when areas are labelled for (future) urban sprawl, the weaker economic functions like agriculture are pushed aside in favour of the stronger economic functions like housing and industry (Visser et al., 2009). This makes agricultural land, especially in the urban fringe, hard to safeguard from urbanisation, even as its values are appreciated (Koomen et al., 2008). Nevertheless, the Dutch policy of strict zoning and clustered urbanisation is regarded as successful because it leaves a decreasing, but still substantial, area for agriculture. In 2012 still 68 % of the land is in agricultural use (15 % for cities and infrastructure allotting 17 % for nature and recreation), leaving the floor for the Dutch Agro-food complex to act as second player at the global market (PBL, 2012; Berkhout et al., 2011).

The strict Dutch zoning policy has its drawback. A complete segregation of agriculture and urban development emerges, quite often even enshrined in physical planning theory and practice (Van der Schans and Wiskerke, 2012: 247). This segregation amplifies the already growing mental and physical distance between the city and its agriculture hinterland (Visser et al., 2009: 186). Where urban-rural linkages growing extinct, cities become increasingly dependent on the (global) Agro-food complex (Sonnino, 2009). A typical meal travels 3,000 km from farm to fork in the Western countries (Pearce, 2006). In the Netherlands food consumption accounts for one third of the national Greenhouse Gas emissions, partly due to these food miles (Vringer et al., 2010). Growing concerns about peak oil, food prices, food security and the sustainability of the contemporary global Agro-food complex discards a shade on the segregation between the urban and rural environment (Morgan and Sonnino, 2010; Ilieva, 2013).

We discussed that strict Dutch zoning policies have been safeguarding farm land from urbanisation. However, this policy combined with the development of a global Agri-food complex also has been leading to segregation between the urban and rural world. Recent urban interest in regional food policies could put farming in the peri-urban area in another daylight (Zasada, 2011). Peri-urban farming already differentiated or diversified to some extent their economic activities in the Netherlands over the past years to meet the urban interest (Van der Schans, 2010). However, peri-urban farms still have to compete with strong economic factors like housing, leisure and business & industry development. The question is whether a peri-urban (planning) policy could stimulate the development of these differentiated or diversified farms in the peri-urban zone and at the same time could protect farming against (future) urban sprawl. Based on two cases in Provence and Tuscany Perrin (2012) concludes that farmland protection in peri-urban areas is more effective when top-down policies are connected with bottom-up initiatives. In his literature review Zasada (2011:646) concludes that the peri-urban area needs to be recognised as an individual policy arena to overcome the rural-urban divide and strengthen urban-rural relationships. This stresses that a policy focused at the peri-urban area is needed to develop peri-urban farm activities.

In this paper we introduce the case of Almere Oosterwold (NL) where the transition of world market oriented farming towards diversified or multifunctional (peri-) urban farming is intended by the municipality of Almere (190.000 inhabitants). This transition should take place over the next 20 years in an area of approximately 4.000 ha east of the city boundaries. Starting point is an open polder landscape where 50 arable and dairy farms have been producing for the world market and where diversified farming activities are lacking. How to build a new diversified peri-urban landscape when bottom-up initiatives in peri-urban agriculture are nearly absent? What should a peri-urban policy arena in Almere Oosterwold look like? We argue that only a change in zoning policy is not enough to transform the features of this area. Because of the pivotal role of (peri-) urban agriculture in this area and the lack of familiarity with it, the city should develop a policy plan with three central issues: land ownership, pioneering with multifunctional urban and peri-urban agriculture, and physically and mentally connecting the area with the city.

Before starting with the case of Almere Oosterwold we will discuss urban agriculture, because of its key role in this case.

2.2 (Peri-)Urban Agriculture: definition

The concept of '(peri-)urban agriculture' knows many definitions, with differences regarding the activities it entails, what is being produced, the place where the activities occur, who is involved, and whether the activities are public or not (Mougeot, 2000; Veen et al., 2012). What most scholars agree about, however, is that urban agriculture is different from and complementary to the current rural agriculture: the lead feature of [urban agriculture] which distinguishes it from rural agriculture is its integration into the urban economic and ecological system (Mougeot 2000:9). It is not its (peri-)urban location which distinguishes urban agriculture from rural agriculture. Van Veenhuizen and Danso (2007:6) deduce, referring to Mougeot (2000), that the most important distinguishing feature of urban agriculture is that it is an integral part of the urban economic, social and ecological system. It depends on typical urban resources, competing for land and water with other urban functions, influenced by urban policies and plans, and contributes to urban social and economic development (Van Veenhuizen and Danso, 2007). Hence, urban agriculture uses resources, products and services found in and around the city and supplies resources, products and services for local consumption in return (de Zeeuw et al., 2011).

In this paper we define urban agriculture as Mougeot (2000:10) does:

UA [Urban agriculture] is an industry located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, which grows or raises, processes and distributes a diversity of food and non-food products, (re-)using largely human and material resources, products and services found in and around that urban area, and in turn supplying human and material resources, products and services largely to that urban area.

2.3 (Peri-)Urban Agriculture in planning

'Politicians and planners are faced with many competing claims for the use of scarce land in and around cities in industrialized countries' (Deelstra et al., 2001: 1). As argued before, this specifically holds for the Netherlands, where population density is high. When land is scarce, it pays off to combine several functions. That way various demands can be satisfied at once (Deelstra et al., 2001). Therefore it is important for (Peri-) urban planners to find complementary uses of land, creating win-win situations (Campbell, 1996). (Peri-) Urban agriculture could offer these complementary uses because it combines functions. It not only provides urban society with fresh food at short distance, but in the Netherlands it combines this with societal functions like education, recreation or care (Van der Schans, 2010). More importantly, growing food inside or in the vicinity of the city is itself associated with benefits for society. Hence, food production is multifunctional in nature: it links to public health, environment and social justice (Morgan, 2009). Agriculture is therefore an effective tool to make productive use of urban open spaces (Mougeot, 2000). Moreover, there is a reasonable demand among urban public for multiple functions and value from farming (Zasada, 2011: 646).

(Peri-) Urban agriculture, however, is largely ignored in urban and regional planning (Taylor Lovell, 2010). This holds for the Netherlands too (Van der Schans, 2010). One of the reasons is that urban agriculture does not have an institutional home. The obvious home of urban agriculture should be the Ministry of agriculture but this ministry may lack the political mandate for urban agriculture. In the Netherlands spatial and urban planning is part of the ministry responsible for housing and spatial planning. The focus of this ministry is urban development city development, whereas agriculture, conservation and landscape development is the responsibility of the Ministry of agriculture. However, the focus of the national spatial planning is changing. Spatial planning is partly handed towards local authorities, providing them more freedom to facilitate local spatial developments (Koomen et al., 2008). This act leaves the floor, to a certain extent, to cities to develop their own spatial and urban planning, which may open the door to (peri-) urban agriculture.

This is the moment to introduce the Dutch city of Almere, a city where local authorities embraced this freedom in developing its own spatial development plan: Almere 2.0 (Almere, 2009). A plan in which it involved (peri-) urban agriculture as part of a new area: Almere Oosterwold.

In the chapter 3 we briefly introduce Almere and then make a step towards Almere Oosterwold.

3 CASE OF ALMERE OOSTERWOLD

Almere is the youngest city of the Netherlands and is located in the province of Flevoland, 30 km east of Amsterdam (figure 1). Planned in the early 1970s on land reclaimed from the sea at the Western edge of the

latest IJselmeerpolder, the layout and design of this suburban city is completely different from other Dutch cities (Roorda et al,. 2011). The original poly-nuclear design of Almere, inspired by the English garden cities of Ebenezer Howard, is unique in the Netherlands (Remmers, 2011). Almere consists of a city centre surrounded by several satellite towns, with large forests, parks, canals and ponds between them (Jansma and Visser, 2011). The original development plans for Almere started from a clear design hierarchy that put landscape above the urban districts, meaning that the green landscape shaped the framework for the lay out of the city districts (Roorda et al., 2011: 66). The large green spaces between its urban nodes were meant to facilitate the connection of agriculture and nature with urban life (Zalm and Oosterhoff, 2010). Almere has grown from zero inhabitants in 1975 to 190.000 inhabitants in 2010 (Remmers, 2011). In its eagerness to grow residential expansion took over the agenda leaving less space for the development of the landscape and open-space (Ilieva, 2013). However, Almere is still this poly-nuclear city with much more green and blue within its borders than average Dutch cities. 80 % of the total surface of Almere is water, woodlands, parks or nature reserve (Almere, 2006). Although part of its origional lay out, urban agriculture was never developed properly, aside from one commercial city farm in the city's fringe (Dekking et al., 2007; Remmers, 2011).

Because of the growing need for new housing in the Amsterdam and Utrecht areas and the absence of locations on the 'old' land, Almere is expected to expand to 350,000 inhabitants by 2030 (Almere, 2009) This expansion, organised by the Almere 2.0 program in which the city cooperates with national and local partners, is part of a national task to reconstruct the Dutch North Metropolis area (Amsterdam-Almere-Utrecht). In anticipation to this Almere 2.0 program, the city introduced the seven Almere Principles: cultivate diversity, connect place and context, combine city and nature, anticipate change, continue innovation, design healthy systems and empower people to make the city (Almere, 2008). The Almere Principles are a result of a close collaboration between Almere and William Mc Donough (the Cradle to Cradle approach). They are intiated by an ambitious aldermen responsible for the Almere 2.0 plan (Jansma and Visser, 2011). These Principles (Figure 2) were developed to direct the city to a sustainable development, as well as support the retrieval of the city's identity, i.e. developing a peoples' city (Remmers, 2011). Almere coined urban farming as one of the vehicles to achieve these ambitions (Remmers, 2011). Moreover, it is the city's desire to produce 10 % of its food locally by the year 2030 (Almere, 2009; Jansma et al., 2012).

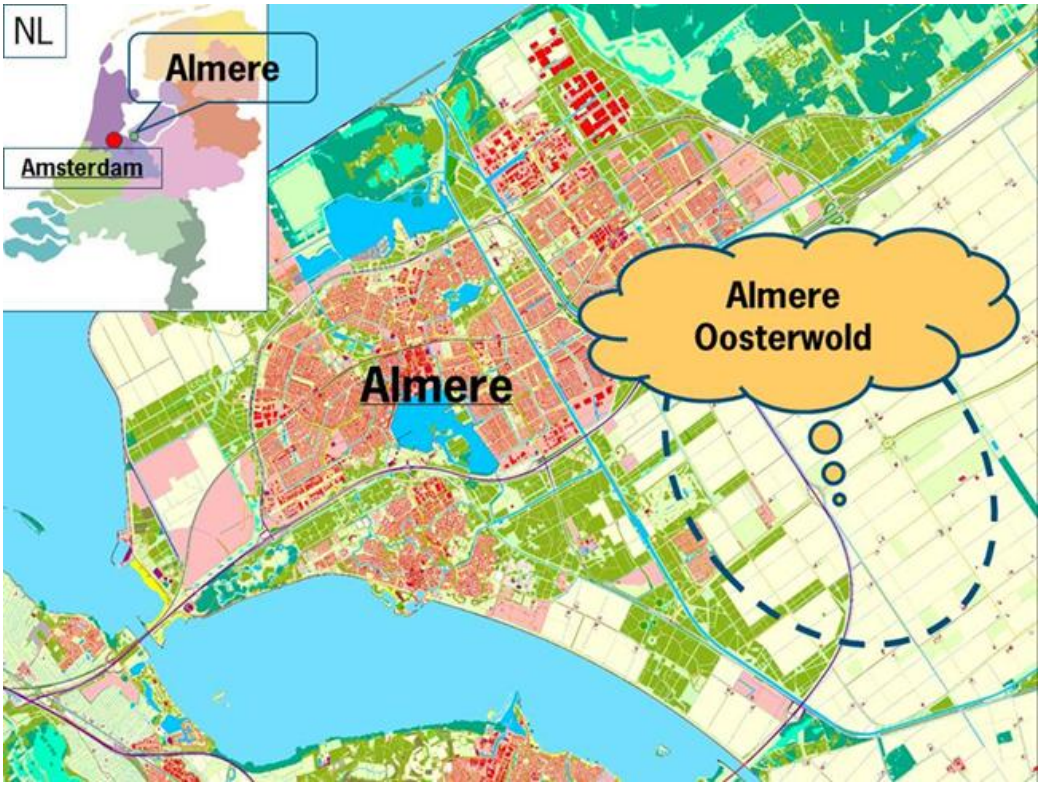

Figure 1. Almere is a new town in the Dutch province of Flevoland with 190,000 inhabitants (2010). As part of its expansion plans, 15,000 new houses on approximately 4,000 ha are planned east of the city: Almere Oosterwold.

Part of the Almere 2.0 program is the transformation of approximately 4,000 ha polder area into a rural-urban fringe with a fixed minimum amount of urban agriculture (50 %) producing for the regional market (Almere, 2012). The remainder is available for housing (30 %) and infrastructure, ditches and public green (20 %). The city's ambition is to develop this conventional agricultural polder area through entrepreneurship and citizens' initiatives towards 'Continous Productive Urban Landscapes' (referring to the CPULs: Bohn and Viljoen, 2005), producing food, energy, resources and water within and for the city (Van Oost and De Nood, 2010). This transformation should ensue over the following 20 years through a so-called 'organic' (i.e. step by step approach or gradual) urban growth. A fundament under this organic development is that there is no fixed development plan. The autorities provide future residents with only a set of rules, the so-called area s' pasport (Almere, 2012). This leaves the floor to future residents to create their own house, estate, neighbourhood, enterprise or urban farm. Moreover, the future residents are challenged to create the area s' genuine identity, the Do It Youtself Urbanism -DIYU- planning paradigm (Almere, 2012; Ilieva, 2013). This development strategy, titled "Almere Oosterwold: Estate for Initiatives", is a revolution in Dutch urban planning as it steps away from the national dictate and top down planning (Almere, 2012). Almere Oosterwold is also a revolution in Dutch urban planning because of the pivotal position of food production – urban agriculture – in the plan (Almere, 2011; Jansma and Visser, 2011).

The Almere Principles
For an ecologically, socially and economically sustainable future of Almere 2030:
1. Cultivate Diversity
To enrich the city we acknowledge diversity as a defining characteristic of robust ecological, social and economic systems. By appraising and stimulating diversity in all areas, we can ensure Almere will continue to grow and thrive as a city rich in variety.
2. Connect Place and context
To connect the city we will strengthen and enhance her identity. Based on its own strength and on mutual benefit, the city will maintain active relationships with its surrounding communities at large.
3. Combine city and nature
To give meaning to the city we will consciously aim to bring about unique and lasting combinations of the urban and natural fabric, and raise awareness of human interconnectedness with nature.
4. Anticipate change
To honour the evolution of the city we will incorporate generous flexibility and adaptability in our plans and programs, in order to facilitate unpredictable opportunities for future generations.
5. Continue innovation
To advance the city we will encourage improved processes, technologies and infrastructures, and we will support experimentation and the exchange of knowledge.
6. Design healthy systems
To sustain the city we will utilize 'cradle to cradle' solutions, recognizing the interdependent, at all scales, of ecological, social and economic health.
7. Empower people to make the city
Acknowledging citizens to be the driving force in creating, keeping and sustaining the city, we facilitate opportunities
The words of the Almere Principles will come alive and become meaningful through human action, by incorporating them on each level into every design for the city as whole.

Figure 2. The Almere Principles (source: Remmers, 2011)

The aim of Almere is that over the next 20 years Almere Oosterwold organically transforms to a rural-urban area with at least 50 % regional oriented (peri-)urban agriculture. To establish this huge ambition, Almere founded the subsidiary Almere Oosterwold in which the major regional representatives participate in 2010. The main task of this subsidiary is to develop a strategic development plan (which includes a basic set of rules for developing in the area, i.e. the area's pasport) which supports the start of the organic transformation of Almere Oosterwold. The ambition is to start in 2013 with the first steps of the transformation of the area. However, the current features of this Almere Oosterwold area do not attract people to develop their house, estate or farm there. The area consists of a large-scale polder layout developed in the late 1960s-early 1970s (Figure 3, top left). The majority of the approximately 50 present-day farms in this area are large-scale (>50 ha) modern arable or dairy farms producing for the global market. Because of the the pivotal role of (peri-)urban farming in the future area and the non-inviting features of the area, the subsidairy of Almere Oosterwold decided to start with leaving the floor to the development of urban agriculture.

Figure 3. The intended step by step transformation of current Almere Oosterwold (top left) to the rual –urban area (bottom right) over the next 20 years (source: Almere, 2012).

In 2011 we were challenged to by the susidiary Almere Oosterwold to support them with elaborating strategies for the organic development of urban agriculture in Almere Oosterwold. In the following part we will explain the subsequent steps in the development strategy we adviced to the subsidairy of Almere Oosterwold.

4 DEVELOPMENT OF PERI-URBAN AGRICULTURE IN ALMERE OOSTERWOLD

The starting point of our journey towards peri-urban agriculture in Almere Oosterwold was to distinguish the characteristics of the future agriculture in this area. That isn't easy because, there are few examples in practice of food production properly planned in and around cites as a systematic approach to build greener and more sustainable metropoles (Van der Schans and Wiskerke, 2012: 250). Using the ideas behind the Almere Principles, urban agriculture only can work if it is an integral part of the city's social, economic and environmental system. This directed us to the potential benefits of urban agriculture using the work of Van Veenhuizen and Danso (2007) and de Zeeuw et al. (2011). These authors recognise three dimensions of urban agriculture; 1) a food-secure and inclusive city; 2) an environmentally healthy city; and, 3) a productive city. Just as Van der Schans and Wiskerke (2012: 251) adapted this model (to manifestations and policy aspects of urban agricuture), we also took this model as our starting point. As the three themes recognised in the work of Van Veenhuizen and Danso (2007) and de Zeeuw et al. (2011) have similarity with the three dimensions of sustainability – people, planet and profit – we combined them. This led to three major aspects of urban agriculture; 'our city', 'healthy city' and 'economic city'.

We then combined these three major aspects with current urban policy issues. The idea behind this is that as urban agriculture is an integral part of the urban system, it can contribute to finding solutions to such issues. This would make clear how a city can benefit from urban agriculture, and for what types of issues urban agriculture can be deployed. Starting point for these policy issues was an exploration by Veen and Mul (2010) who studied policy issues of four major cities in the Netherlands (Rotterdam, Groningen, Tilburg and Almere) during the regional elections of 2010. The authors listed and aggregated the main policy issues in these four cities, looking specifically at those issues that could benefit from urban agriculture. Issues that were similar were combined, or joined under the same heading. This process led to six major policy issues to which urban agriculture can potentially contribute; society, learning and working, recreation and leisure, living environment, food and health, and sustainability (Veen and Mul, 2010).

The next step was to combine the three major aspects (our city, healthy city and economic city) with these six major policy issues. Within these six major policy issues, we made six couples of two themes using the list of main poliy issues during the regional elections of 2010. Three of these couples – Added value, sustainability, and participation – fall within one of the three major aspects of the urban agriculture city. The other three couples – learning and working, liveability, and health – fall within two adjacent aspects, that

way connecting our city, healthy city and economic city. By making these connections, we recognise that urban agriculture can contribute to various issues and that such issues cannot be perfectly separated. Graphically represented, this resulted in Figure 4.

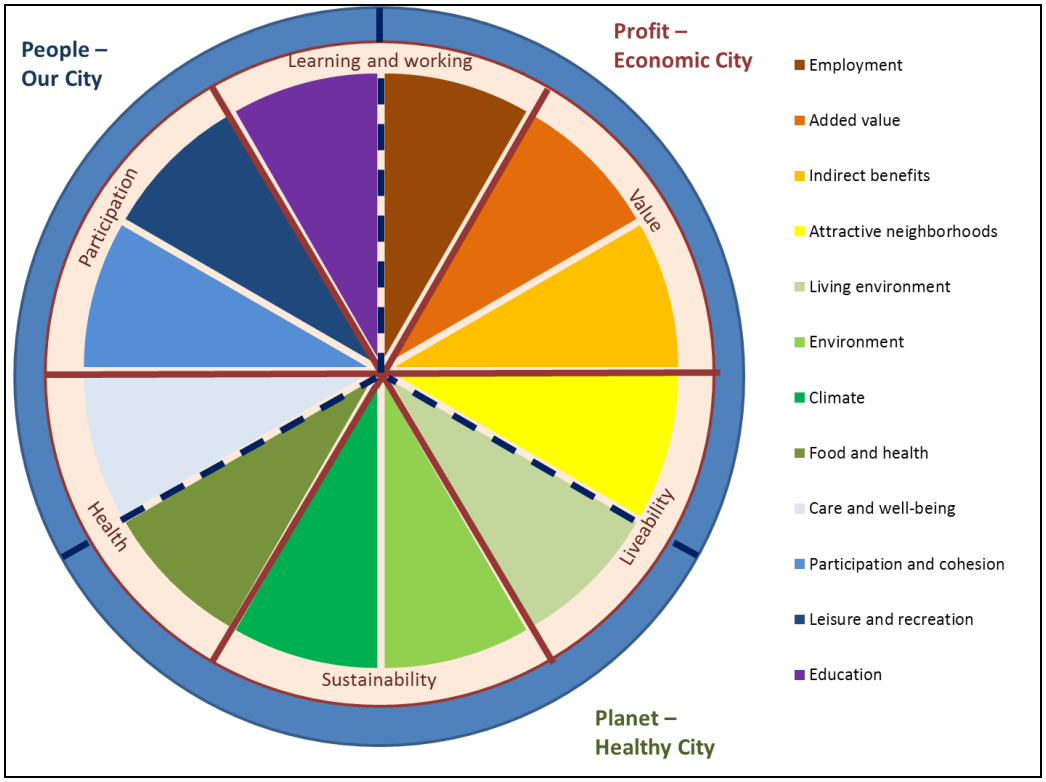

Figure 4. The twelve policy themes of urban agriculture based on a survey in four Dutch cities during local elections of 2010.

Subsequently, we coupled each of the twelve themes from Figure 4 with a current initiative, concept or enterprise in the Netherlands. As urban agriculture is multifunctional, a specific initiative would fit several themes, but for each theme we chose an example that would be most explanatory or illustrating. Hence, this is not to say that an example would not fit within another theme. Table 1 shows the twelve themes and the twelve respective examples. In the table we also mention the estimated required size and location for this type of initiative, requirements for succesful development and chances and obstacles for development. This way, the twelve examples can be seen as twelve 'prototypes' of urban agriculture.

At least six of these prototypes have te potentional to be a part of future Almere Oosterwold. These prototypes require a minimum size of land starting with 5 ha. The smaller urban agriculture initiatives problably will start in the vicinity of the city, where the more production oriented ones will flourish at a some distance of the city. The land available for urban agriculture should be preserved for a long period (> 10 years). So the zoning policy for this area should provide these minimum sets of land throughout the area and prevent these to future urban sprawl. Developing a trust in which the peri-urban agricultural land is accommodated could be a strategy to prevent agricultural land to future urban sprawl. This land conserving trust could also provide newcomers from outside the area with land to establish their urban agriculture initiative. This new input is possibly needed. A survey carried out in 2011 with 15 current entrepreneurs from the Almere Oosterwold area shows that only a quarter to half of them are potentially interested in a conversion to an urban-oriented agriculture. The different prototypes do face potentional obstacles like accessibility, distance to the city, infrastructure and logistics and distribution of the produce (Table 1). A set of rules and instruments could help to overcome these obstacles. The question is which roles urban agriculture on one hande and the susidiary Almere Oosterwold (or municipality) should play in the organic development of the area. Moreover, the question is also who has the lead in solving the obstacles because there will be no fixed plan. In an area unfamiliar with urban agriculture, moreover unfamiliar with organic development, it is hard to indentify who should have the lead. Hence, to develop a dynamic set of rules (and instruments) it is advised to provide the pioneers in urban agriculture with free space to experiment. In order to coordinate and facilitate this free space the municipality should appoint an area manager. The access to the process of experimenting and improving provides the area manager (and the municipality) new instruments

(and rules) to conduct the development of this area. The pioneer space also can inspire newcomers or the current farmers in the area. In the path of both zoning and pioneering the transition of the environment will follow. It this transition proces new residents are challanged to settle in the area. Essential is that from the foundation of Almere Oosterwold the area inextricably is connected to the city, physically as well as mentally, through infrastructure, and produce stream, and in the communication. This not only will be a responsibility of the municipality but of all stakeholders in the area. The (peri-) urban agriculture in the area has a pivotal role because it seduces residents of Almere into the area and also delivers their produces to the city. Urban agriculture in Almere Oosterwold is in a way the first step towards a reconnection of the urban and rural environment.

5 CONCLUSION

In this paper we introduce the case of Almere Oosterwold (NL), an area of approximately 4.000 ha east of the city boundaries. This area should organically alter from a open polder area with world market oriented agriculture towards an (peri-) urban area with diversified or multifunctional (peri-) urban farming and housing. This transition should take place over the next 20 years in. Starting point is a polder landscape where 50 arable and dairy farms have been producing for the world market and where diversified farming activities are lacking. We asked ourselves how to develop a new diversified peri-urban landscape with a central role for (peri-) urban agriculture when bottom-up initiatives in peri-urban agriculture are nearly lacking? Using the ideas behind the Almere Principles, we argued that urban agriculture only can work if it is an integral part of the city's social, economic and environmental system. This directed us to the potential benefits of urban agriculture translated in three major aspects of urban agriculture; 'our city', 'healthy city' and 'economic city'. Based on current policy issues we discerned twelve themes within these three major aspects of urban agriculture. These twelve themes were visualized through connecting each with a current urban agriculture initiative or concept. These are the prototypes of (peri-) urban agriculture which could potentionally be developed in this area. We argued that only a change in zoning policy is not enough to develop these type of (peri-) urban farming. Because of the pivotal role of (peri-) urban agriculture in this area and the lack of familiarity with it, the city should develop a policy plan with three central topics: land ownership, pioneering with multifunctional urban and peri-urban agriculture, and physically and mentally connecting the area with the city. These three topics are the first steps to guide Almere towards a process of reconnecting the urban and rural environment.

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A	Policy theme	Example	Optimal/required size	Optimal location	Requirements	Chances	Obstacles
Economic City	Employment	Ridammerhoeve, an organic goat farm open to the public. 250.000 visitors a year. Offers app. 10 full time jobs. Cheese making, playground, education and conference centre, pet farm (http://www.geitenboerderij.nl/).	5 - 25 hectares	Peri-urban	Flexibility in rules and regulations, e.g. regarding zoning and licenses	Commercially viable	Difficult balance between agriculture and activities
						Many employees necessary	Municipal flexibility needed for room to develop, zoning and permits
					Finding a balance between agricultural work and activities for visitors	Employment in different areas	Specific infra structure needed: accessibility, parking, bike routes
						Farm rents land from municipality	Land is scarce and expensive; long term land lease
					Easy accessible to the public	New business	
	Added value	Stadsboerderij Almere, organic urban farm. Beef cattle, arable and vegetable farming. Meadows and fields spread over the city. Care, farmers market, new artisan business and education (http://www.stadsboerderijalmere.nl/).	50 > hectares	Peri-urban	Security of access to land over longer period	Commercially viable, close market	Land is scarce and expensive
						Different activities means involving many people in food production	Difficult to get long-term land lease
					Access to market, small distance to market	Through education sustainable connections with citizens	Building a sustainable distribution system within the city: economically and environmentally
						Connections with citizens gives right of existence	
	Indirect benefits	Doarpstún Snakkerburen, community garden. Various vegetables grown, sold in garden shop. Run by volunteers. Cultural activities organised, meeting place for neighbourhood, education (http://www.dedoarpstun.nl/).	< 1 hectares	Urban	Access to volunteers	When indirect benefits known, it is more clear what urban agriculture can bring	Indirect benefits like better health or beautiful neighborhood often unclear
						This particular example does not get subsidies and manages, even pays rent	Sometimes hard to find volunteers for running the garden
					Access to finances	A meeting place for different people	Finances for similar projects are hard to find
	Attractive neighborhoods	Community garden Parmenidesstraat, Amsterdam. Community garden surrounded by housing block. Started by housing corporation, twelve residents have private plot. Design made together (http://www.buitenruimtevoorcontact.nl/projecten/moestuin-in-wijsgerenbuurt-amsterdam).	< 1 hectares	Urban	Access to open space for a longer period of time	Involves people in their neighborhood and strengthens feelings of ownership and increases social contacts	Longterm agreements with municipality
						Multifunctional use of land available due to the financial crisis	
					Ambitious people in neighborhood	A way to prevent people from moving out of the neighborhood	People in (mixed) neighborhoods may not be used to work together, takes time and maybe set of rules
						A more attractive neighborhood makes higher rents possible	

B	Policy theme	Example	Optimal/required size	Optimal location	Requirements	Chances	Obstacles
Healthy city	Living environment	Creatief Beheer, organisation that sees maintenance of green areas as vital for neighbourhood improvement. Works with all neighbourhood stakeholders and improves the quality of the neighbourhood with the residents. Human interaction is central (http://www.creatiefbeheer.nl).	< 1 hectares (area)	Urban	Access to open spots for a longer period of time	Multifunctional use of (derelict) urban spots, opposing degradation	People in (mixed) neighborhoods may not be used to work together, takes time and maybe set of rules
					Freedom to change the neighborhood landscape	A way to prevent people from moving out of the neighborhood	
						Brings people together, increases social contacts	Municipal flexibility needed for room re-furnish neighborhood
	Environment	Agromere, a virtual city district on 250 ha. Closing the nutrient cycle is one of the targets of this concept (www.agromere.wur.nl). which integrates living space on 70 ha (for 5,000 inhabitants) with 180 ha urban agriculture.	> 50 hectares	Peri-urban	Closing nutrient cycles requires flexibility in rules and regulations	Closing cycles by (re) using organic waste cycles	It is not permitted to re-use human urine and faeces
						Closing cycles is possible on different scales	Besides using household waste, other ways to close cycles are still far, although small systems are working
						Composting household waste improves soils	
					Closing nutrient cycles requires more technical possibilites	Possible to re-use phosphate and nitrogen	Large-scale waste processing is bound by strict rules
						Agricultural and urban waste can be used to produce bio-energy	Continuity in deliverance of energy can be problematic
						Urban agriculture as incubator for innovations	
	Climate	Oregional, short food chain by farmers. Cooperation sells products from the twenty members directly to buyers in the region, like restaurants and hospitals. (http://www.oregional.nl).	Not applicable	Peri-urban	Good cooperation between farmers	Potentionally lower foodmiles	As consumers make most food miles and large-scale food systems are very efficient, it is unclear to what extent food miles are really reduced
						Less links needed in the food chain, higher price for farmers produce	Small-scale local food processing may be less efficient in energy use
					Efficient logistics	Fresher products	
						Added value remains in the local area	
	Food and health	Bioakker, organic harvest-it-yourself garden. Maintained by entrepreneur. Members pay initial amount, substract the value of what they harvest. Members are invited to help with the gardening work. Prices are low to make it widely available (http://www.bioakker.nl).	1 - 5 hectares	Urban	Producing space of good quality, large enough and accessible, long term lease	Awareness of local and seasonal food increases	Space to produce - good quality, accessible, large enough - is scarce in the city
						Multifunctional use of the land available due to the financial crisis	Temporality of land may put entrepreneurs off
						Direct relation with producer of food	Policy and regulation not yet suitable for large-scale
					Flexibility in policies and regulations with regards to commercial food production in the city	Fresh food is available and close by	In this example: garden not close to supermarket which is an obstancle for visiting
						Short supply chain	

C	Policy theme	Example	Optimal/required size	Optimal location	Requirements	Chances	Obstacles
Our city	Care and well-being	Moestuin Maarschalkerweerd, organic urban care farm. Daily activities and reintegration trajectory for people with distance to employment. Work in garden, lunch cafe and shop. Playground and educational projects (http://www.moestuinutrecht.nl).	5 - 25 hectares	Peri-urban	(Government) funding to pay for care	Various benefits for people when working in green environment; stress release, daily rhythm, working with others	Pressure on income from care due to cuts in funding
					Available space close to public, long-term lease		Land is scarce and expensive; long term land lease
						Care farm in the urban fringe less far than in rural area, less travelling	Specific infra structure needed: accessibility, parking, bike routes
	Participation and cohesion	Moestuinjes IJburg, small individual garden containers on unused land in Amsterdam. Allotment complex founded, residents hire three containers. The municipality takes care to furnish the site (http://debrugkrant.nl/volkstuintjes-op-braak-liggende-kavel-haveneiland).	Containers of 1m^2	Urban	Effort to include different groups in the project	Project is mobile and can be moved	Some people or groups may be left out
					Flexibility in policies and regulations in order to use public space	People work together to beautify their area	When the project moves, this may lead to disappointment
	Leisure and recreation	't Geertje, organic recreational farm. Mostly goats but also milking cows, pigs, chickens and horses. Cheese making, sold in farm shop and farm restaurant. Hiring boats, canoes and bikes. Overnight accomodation, company outings, childrens parties, bachelor parties. 100.000 visitors yearly (http://www.hetgeertje.nl).	25-50 hectares	Peri-urban	Consistency in rules and regulations; recreational farms need to comply with both agricultural and recreational regulations	The target group is close, increases social contacts	Too many visitors can lead to nuisance for local residents
						Diversified activities offers extra income to farmer	Land is scarce and expensive; long term land lease
					Rules to minimise nuisance (noise, smell, traffic)	(Peri-Urban) farms fit with what people are looking for; leisure, green space, animals	Regulation can be an obstacle, as farms need to comply with agricultural and recreational regulation, which may be contradictory
	Education	Buorkje op 'e Skoalle, agriculture lessons in schools. Primary school students get one full day and two half days workshops on food and agriculture from secondary vocational students, for whom this is part of their curriculum (http://vimeo.com/45890484).	Not applicable	Both are suitable	Flexibility in school programmes so that there is space for these types of classes	Offers opportunities to teach children how food grows	Schools have to comply with strict programmes in which it is hard to find space
						Education is possible in diverse urban agriculture initiatives	Schools do not always have the financial means or staff to join
						Especially working with the harvested food is a tool to involve parents and local residents	It may be harder to reach adolescents through urban agriculture
					Classes should be free and staffed as most primary schools may not have financial means or staff	Agriculture can be used for various subjects, from maths to biology and drawing	
						Especially useful for children for whom cognitive learning is harder	

Table 1. Three major aspects of urban agriculture; A: 'economic city', B 'healthy city' and C 'our city' divided in twelve policy themes. Each of the twelve themes is coupled with a current initiative, concept or enterprise of (peri-) urban agriculture in the Netherlands. The table also mentions subsequently the estimated required size and location for this type of initiative, requirements for succesful development and chances and obstacles for the development.This table was adjusted from Veen et al. (2012) and Jansma et al. (2011).