

Agromere: Integrating urban agriculture in the development of the city of Almere

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The objective of Agromere, a planning concept for an area situated in the rapidly growing Dutch city of Almere (185,000 inhabitants), was to explore opportunities to re-integrate agriculture into modern Dutch city life, while at the same time inspiring stakeholders to incorporate urban agriculture in the city's actual development plan. Through a combined stakeholder and design process, a virtual city district on 250 ha was designed which integrates living space (for 5,000 inhabitants) with urban agriculture. This concept design contributed to the municipality of Almere's own development plan, which was launched in 2009. The city's plan highlights urban agriculture and is in this regard a unique system innovation in Dutch urban planning.

Agriculture and the city

Since WWII the main Dutch spatial planning policy has been to concentrate or cluster urbanisation, with the aims of keeping the landscape open and undeveloped, limiting travel distances and supporting amenities (Van Remmen and van der Burg, 2008). This policy has led to extremely sharp fringes between city and countryside and a growing (mental and physical) distance between the city (and its citizens) and the countryside (and its agriculture). Consumers in the city have become estranged from food production, nature and the basic values of rural life, such as quietness, darkness and the rhythm of the seasons, while farmers in the rural areas produce food and products for the world market with hardly any connection to their neighbouring cities (Slingerland *et al.*, 2003).

Urban agriculture produces food and food-products within the city, or in the city's fringes and simultaneously provides non-food products and services for city dwellers (Mougeot, 2000). It is as old as our cities, but lost its role in the 19th century mainly due to new means of conservation and transportation of food (Steel, 2008). In our modern world, urban food production is receiving increasing attention once again in both developing and developed cities worldwide, including in the Netherlands (Van der Schans, 2010; Van Veenhuizen, 2006). In addition to its importance for food



Less than 10 percent of the municipality of Almere is still in agricultural use, and this percentage is decreasing rapidly (By Arjan Dekking)

production, urban agriculture can have an added social, economic and environmental value. Urban agriculture operates within the urban system, and the resulting connection between the city and urban agriculture benefits both city inhabitants and producers (Visser *et al.*, 2009).

The innovative design of Agromere, in the Dutch city of Almere, shows that it is possible to re-integrate agriculture in city development in the Netherlands and thereby contribute to a more sustainable and liveable city.

Almere

Almere is a new and rapidly growing suburb, 30 km east of Amsterdam, with 185,000 inhabitants in 2009 (figure 1). The original poly-nuclear design of Almere is unique in the Netherlands. Implemented in the 1970s, it consists of a city centre surrounded by several satellite towns, between forests, parks, canals and ponds. Urban agriculture was also part of the original design (Zalm and Oosterhoff, 2010). This poly-nuclear structure is still evident today, and the city has much more green and blue within its borders than average Dutch cities, but urban agriculture was never developed properly, aside from one commercial city farm in the city's fringe (figure 2; Dekking *et al.*, 2007).

Almere is expected to expand to 350,000 inhabitants by 2030 (and become the fifth largest city of the Netherlands), because of the growing need for new housing in the Amsterdam area and the absence of locations on which to build. In its plans for this large-scale expansion, the city council of Almere included ecology and sustainability as central themes. The so-called *Almere Principles* (Almere,

2008) consist of seven starting points for sustainable urban development: cultivate diversity, connect place and context, combine city and nature, anticipate change, continue innovation, design healthy systems and empower people to make the city.

Northeast of Almere 15,000 new houses are planned on approximately 4,000 ha, which is now fertile agricultural land (figure 3). In this so-called Almere Oosterwold area about 50 farmers, mostly large-scale arable and dairy farmers, currently produce for the world market. Part of this land belongs to the neighbouring municipality of Zeewolde.

Stakeholders

Agomere started in 2005 as a research project but evolved into a combined design, research and stakeholder process. The objective was to explore opportunities to re-integrate agriculture into modern city life in Almere, while simultaneously inspiring the city council of Almere and local stakeholders to include urban agriculture in city development plans. In this project it was seen as essential that all key stakeholders participated right from the beginning and fully contributed to the final results. We used different methodologies and approaches in the consecutive phases of the DEED framework: **D**escribe, **E**xplain, **E**xplore and **D**esign (described in: Visser *et al.*, 2009).

We combined the DEED framework with the stakeholder management approach (Freeman, 1984), which involves communicating, negotiating, contracting, managing relationships and motivating. The stakeholders involved in the Agomere process were representatives of local farmers (of the Almere Oosterwold area), the city councils of Almere and Zeewolde, the province of Flevoland, nature and environmental organisations, the board of small and medium-size businesses in Almere, the Ministry of Agriculture and commercial city developers.

The design of Agomere

Before starting the design process, a number of design principles were developed and agreed upon with the stakeholders (see box).

Design Principles

1. *Nutrient cycles both within the farming systems and the urban systems have to be closed.*
2. *Energy must be produced locally, resulting in a climate neutral or an energy-producing district.*
3. *For the calculation of the different farming systems we assumed that 50 percent of the produced food and food products could be consumed in the district.*
4. *The district will not be an autarky for human food or animal feed.*
5. *Traditionally in any new district, a large part is reserved for public green areas and public services like schools,*

shopping malls, elderly care, etc. In the Agomere approach, the public area will be used for urban agriculture. Therefore urban agriculture has to provide these facilities.

6. *Housing and agriculture are integrated in this concept. Production and processing of food is therefore located directly next to the area's inhabitants, leading to the assumption that organic farming is more appropriate to Agomere.*
7. *Since the farms exchange material, the consequence of principle 6 is that all farming systems should be organic.*
8. *Farms are commercially healthy enterprises exploited by entrepreneurs.*

Based on data of average district sizes in Almere (provided by the municipality of Almere), Agomere was designed as a city district of 250 ha with an area of 70 ha for houses and infrastructure, and 180 ha for agricultural activities. The district would cater for approximately 5,000 inhabitants (or 2,300 households) resulting in 30 households per ha, which is a normal figure for new districts in the Netherlands.

We designed four different urban farms, based on the households' needs for food and other products. The reference point used was the daily food intake of an average Dutch person (Van Akker, 2006; CBS, 2009). The production of fresh vegetables was the starting point for the urban agriculture design. The farms would use or reuse rest products, labour, raw materials and waste. A large part of the produce would be sold directly to customers through the common local supermarket. The farms would potentially earn more than similar farms producing for the world market, mostly because of higher prices paid to the producer (due to shorter supply chains and distribution channels) but also because they could generate additional income through the provision of services such as energy, elderly care, recreation and education. The four farms were designed as follows:



An urban farm in Almere focuses on maintaining a good relationship with city dwellers (Photo Arjan Dekking)



An additional 15,000 new homes are planned for Almere Oosterwold, northeast of the city, and currently occupied by arable and dairy farmers that produce largely for the world market (Photo Jan Eelco Jansma)

Vegetables and fruits, with chickens and cereals

Based on the average consumption of 5,000 inhabitants, approximately 9 ha of vegetables and 4.5 ha of fruit would be sufficient. To maintain a good crop rotation, the farm would also cultivate cereals, which would be fed to the hens (the manure of which would be used to fertilise the vegetables crops). The number of chickens kept would depend on the volume of cereals grown in this system, but the result would be one egg for each citizen every week. The total area of the vegetable and fruit farm would be about 25 ha.

Greenhouses, with community services

With new technologies, modern greenhouses could become net energy producers. It was calculated that approximately 6 ha under glass would be needed to meet the energy needs of the 2,300 households in Agromere. Of this area, 3.5 ha would be used for the production of vegetables and flowers, while the remaining 2.5 acres would be used for community functions like the elementary school, a restaurant, a meeting place, etc.

Arable farming with beef cattle

The scale of arable farming would be determined by the need for two basic food products: bread and potatoes. Based on average consumption, approximately 15 ha of potatoes and 45 ha of grain would be needed to cover the district's needs. The mineral demand (manure) of both crops would determine the number of beef cattle (approximately 150 adult animals) on this farm. The forage for this livestock would come from outside the district (a nearby nature reserve). The rest product of the grain crop, straw, would be used in the barn. Together with land for the two crops and a livestock stable this farm would need 61 ha.

Dairy and community services

The remaining 88 ha designated for agricultural activities

would be used for an animal husbandry farm with dairy cattle (approx. 60), sheep (approx. 70), goats (approx. 120) and riding horses (approx. 40). Milk production on this farm would be sufficient to meet the district's need of fresh dairy products like milk, butter and cheese. These 88 acres would not be sufficient to meet all the forage needs. Part of the forage for the livestock would be collected from the commons in the district and from outside the district (a nearby nature reserve). Besides production, the farm would have an educational purpose and could deliver all kinds of services for the district and people living in or visiting the district.

Discussion

The design of the virtual district of Agromere is shown in figure 4. Because all stakeholders were involved from the beginning, they remained fully committed throughout the design process. All stakeholders present at the final workshop stated that the most important result was the development of and consensus regarding design principles, which ultimately influenced the municipality's development plans for Almere Oosterwold.

Like many multi-stakeholder processes, the Agromere project required careful, solid and energetic management. At the start, stakeholders were not familiar with the idea of urban farming nor the role it could play in urban planning. The DEED framework was helpful in structuring this multi-stakeholder process. A key step was the stakeholder analysis, which identified each stakeholder's interests and motivations so that solutions could be provided that link urban agriculture to the interests of these stakeholders. For instance, the city's budget is heavily burdened by the need to maintain city greenery. We showed that urban agriculture could be part of the city's green environment, resulting in lower management costs. The farmers in Almere Oosterwold also want to continue their farming activities. Normally city

development would force farmers to move, but the Agromere concept shows the opportunities offered by urban agriculture, and how the farms could be adapted in order to stay in the region and maintain their agricultural activities. All stakeholders in the area now recognise the added value of urban agriculture and are committed to the concept.

Installation of a new city board in 2006 provided an unexpected advantage for the Agromere project. The new ambitious alderman responsible for the city's development plans became the initiator of the Almere principles. Right after taking office, he was presented with the first copy of a brochure on the Agromere project. This intervention, and his speech afterwards, in which he embraced the idea of reconnecting city and farming, were crucial in generating more support from the city's civil servants.

The design of Agromere inspired the city planners to include urban agriculture in their plans for the Almere Oosterwold area. In the draft Strategic Vision for Almere (called Almere 2.0), urban agriculture is highlighted as one of the driving forces for the Almere Oosterwold area (Almere, 2009). The city's ambition is to develop this area towards a so-called continuous productive urban landscape producing food, energy, resources and water within and for the city (based on Viljoen, 2005). Through entrepreneurship and citizens' initiatives this conventional agricultural polder area should be transformed into a rural urban area by 2030 (Van Oost and De Nood, 2010). This would make Almere Oosterwold a unique innovation in Dutch urban planning. The city of Almere is now developing a strategy to realise this transfor-



An artist's impression of the Agromere district [By Emiel Geerding and Mieke Vuijk]

mation. Part of this development strategy will be the design of the infrastructure needed to realise the ambition of local food production and distribution, local energy production and the reuse of waste.

The Agromere project is finished, but the promotion of urban agriculture in the area continues through the Development Centre for Urban Agriculture (in Dutch: Ontwikkelcentrum Stadslandbouw Almere) established in 2011 by a group of stakeholders. Its ambition is to direct, initiate and connect initiatives in order to stimulate further development of urban agriculture in Almere.

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