



Sustainable Agribusiness in Metropolitan Areas





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Smart solutions for metropolitan agriculture

The world over, more and more people are moving to cities. The prediction is that by 2050 some six billion people will be living in big cities. All these people will need sufficient, healthy food. Farmers in the areas around and between big cities – we call their work metropolitan agriculture – will have to produce that food. At the same time, increasing demands are being placed on metropolitan agriculture. Sustainable production methods need to be used: ones that are accepted by the local population and are appropriate for densely populated areas.

To meet the demand for more and healthy food production in a restricted environment we need to develop smart business models and new value chains that include producers and consumers. To develop these we need new coalitions of and collaboration between agricultural entrepreneurs, governments, consumers and other parties, which create new opportunities for the agricultural business sector, locally and also in the Netherlands.

Van Hall Larenstein University of Applied Sciences created the professorship of Sustainable Agribusiness in Metropolitan Areas in 2012 to link education, research and business practices related to these chains. Rik Eweg was appointed professor in October 2013, bringing his research and public-sector management experience to the group. Eweg: 'We develop the competencies and knowledge needed for sustainable agribusiness in metropolitan areas.'

Starting out small, the group developed gradually over the past four years and has established 'Living Labs' within which intensive collaboration now takes place. These Living Labs are networks of universities of applied sciences and professional education, businesses and governments, where entrepreneurs, students and researchers learn with and from each other about sustainable metropolitan agriculture. The Living Lab in the metropolitan region around the city of Pune in India focuses on dairy farming. In Serbia and Romania the Lab looks at fruit, vegetables and dairy farming, and in the Gelderse Vallei in the Netherlands the focus is on processing barley and spelt for beer and bread that are sold locally. Rik Eweg: 'Our role is to facilitate collaboration between different parties, also in other cultures. This requires mutual respect and taking into account the interests of others.'

The Living Labs have set up large projects in which many VHL students, entrepreneurs and researchers gain experience. Education, research and practice go hand in hand, Eweg explains: 'Entrepreneurs benefit from the knowledge and input of students and researchers, while those on the business side provide relevant issues and subject matter for those engaged in education and research.'



Rik Eweg
Lector at Van Hall Larenstein University of Applied

Metropolitan agriculture: what's it about?

Project: Spelt on the Doesburger Eng, Netherlands

Farmers on the Doesburger Eng, in the Achterhoek area of the Netherlands, used to grow maize for animal feed, but are now starting to grow spelt and barley instead for local beer and local bread. The project focuses on organising the chain and the marketing of a regional product.

More and more people now live in large cities, especially in developing countries. Metropolitan agriculture needs to be able to feed these people. But what exactly are the features of metropolitan agriculture?

Part of the urban population is made up of a growing middle class that wants high quality food. Professor Rik Eweg: 'This represents an opportunity for farmers to command a higher price for their products, via short chains. Indeed, many farmers do gear their production to this upper segment of the urban middle class, but at the same time the poor who live in the slums also need to eat.'

Urban dwellers make demands as to how their food is produced. On the one hand it needs to be safe, healthy and sustainably produced, but for other consumers it needs to be cheap. Agricultural production also has to take into account societal issues of concern to city dwellers, such as animal welfare and climate change. It is also literally a question of fitting in, as land is often scarce as a result of encroaching construction and roads, and as more claims are placed on water and energy. As a result, much of the farming is intensive, such as greenhouse horticulture or livestock production. At the same time, agricultural work is less attractive than work in the city and this has consequences for the amount of labour available for metropolitan agriculture. Metropolitan agriculture takes place in the areas surrounding, between and in cities. It is distinct from urban agriculture, as it does not necessarily happen within cities.

Metropolitan agriculture faces many challenges, but also offers opportunities for innovation, for example through new technology that is adjusted to a particular situation. Marketing opportunities are created by responding to the wishes of urban dwellers, for example promoting local and regional produce. The professorship of Sustainable Business in Metropolitan Agriculture works on these challenges and opportunities in a variety of projects.



Project: Living lab, Balkans

In Serbia, one of the Balkan countries, a cluster analysis of the soft fruit sector has been performed, showing which type of enterprises are absent, and the opportunities available for businesses, including Dutch companies. There are also opportunities for regional branding of products, and this is the approach being taken in Romania, where short chains for vegetables, fruit and milk are being combined with agritourism.

Strategies and licences

'By gaining an understanding of farmers' possibilities and strategies, we can offer better advice to producers and governments,' says Professor Rik Eweg. The strategies are often the result of the interplay between farmers and their environment.

Farmers and other entrepreneurs engaged in metropolitan agriculture are not always automatically allowed to produce. They need to get a 'licence to produce' from the government: formal permits or rights. Often they need a 'licence to operate' too, which has to do with public acceptance of the way they produce, for example in terms of animal welfare or climate change. Their 'licence to sell' is in turn dependent on this: people have to want to buy their products.

Entrepreneurs can adopt various strategies to earn their 'licences'. One of these is valorisation: earning more for a product by increasing its value. This is usually linked to a product being of higher quality, or involves marketing it as organically produced, or locally produced. Jan Hoekstra, a lecturer in Sustainable Chain Development and Chain Empowerment at Van Hall Larenstein: 'Valorisation requires the development of a chain, for cooperation and for traceability of a product.' Another strategy is diversification, for example farmers who extend their farm activities to include non-farming activities such as a campsite. The final strategy is to engage in a sustainable form of intensification, where the farmer produces more on less land or with fewer animals.

'It's important to realise that farmers don't choose a strategy in isolation,' says Hoekstra. 'The opportunities that farmers have arise from an interplay between farmers and consumers, citizens and government. A farmer takes chances within this context.'



An example: the Raak dairy project in India is about valorisation. A farmer can earn more by producing better quality milk or by going over to organic production. Valorisation can also be about intensification as a result of making production more efficient through new technology, improved animal accommodation and improved livestock breeds. But from the project it emerged that farmers were only likely to start keeping a different breed if influential people in the surrounding area, whom they were dependent on, encouraged them to do so.

The Dutch farmers on the Doesburger Eng also choose their strategy to some extent based on factors in their environment. Marco Verschuur, coordinator of the Master's programme in Agricultural Production Chain Management: 'Farmers choose to grow barley on part of their land and to sell that as a local product, or as an ingredient in locally produced bread or beer. That's valorisation. The initiative for this comes from local people, from the local Doesburger Eng society. It is also something farmers themselves want, but apart from that they also feel pressure to grow less maize, as people want a more attractive landscape.'

Project: Dairy cattle in Baramati, India

There are many dairy farms in Baramati, which lies close to the big city of Pune in western India. The group has set up a dairy cattle project, financed by SIA-RAAK, with businesses and researchers in Baramati, together with a group of Dutch companies. The business models of eight Indian farming families have been analysed to see how they could improve cattle breeds and introduce adapted cowsheds, improve farming techniques and smarter marketing, possibly with technological support from the Netherlands.



**Project:
Regional branding
in the Balkans**

A cluster analysis of the soft fruit sector – strawberries and raspberries – was done in Serbia. A well functioning sector requires not only producers but also suppliers, logistics companies and processors, service-based companies such as marketing businesses, insurers and banks, and knowledge institutions. The analysis gave Dutch companies information on the opportunities still available in this sector. These turned out to be in marketing soft fruit as a regional product.

Regional branding is also the aim of a project in Romania, where short chains for fruit, vegetables and dairy products are being developed to exploit niche-markets in urban centres. Higher quality produce is required than what farmers have been producing until now. There are also opportunities to combine these developments with agritourism in northeast Romania.

Local beer and bread from the Doesburger Eng

Farmers on the Doesburger Eng in the Dutch countryside are affected by urbanisation: new housing is encroaching and threatening the area. And the public would rather see a varied landscape of grain fields than monotonous maize. The situation represents an opportunity for farmers, and Van Hall Larenstein helped them to develop business cases.

Farmers on the Doesburger Eng earn most by growing maize, but since 2013 six arable farmers have been growing barley and spelt again for the Doesburger Eng Regional Products cooperative society, which was formed out of a local society for this particular area. The aim of this cooperative of local residents, farmers, shopkeepers and people in the hospitality trade is to conserve original landscape values and social cohesion of the area. Conservation of the area is also important for the farmers, as barley and spelt look more attractive, create more open views over the Eng, as well as contributing to conserving biodiversity. Marco Verschuur, coordinator of the Master's in Agricultural Production Chain Management at Van Hall Larenstein University of Applied Sciences, is involved in the cooperative and the society, and coordinates the research assignments undertaken for the development of local products.

The barley and spelt are used to make local beer and bread. The farmers grow the malting barley too that is malted and used to brew local beer. The beer is not only sold around the Doesburger Eng, but also to small outlets in other towns further away. Three farmers grow spelt and rye. Spelt is de-hulled in a special machine and then milled by a local miller. A traditional baker in nearby Lunteren makes local spelt and rye bread from the flour, which is then sold in farm shops on the Doesburger Eng.



**Project:
Healthy school meals**

School meals are important for child nutrition in India. Research done by students at Van Hall Larenstein has shown that the school meals lack the proteins and vitamins found in animal products. As a result, the Sustainable Agribusiness in Metropolitan Areas group is working on ways to improve the meals, together with a Dutch-Indian company that produces plant-based proteins and a Dutch-Indian bank. The women's groups that prepare the meals are being helped to draw up a more commercial business plan, and instead of buying the ingredients for the meals on local markets they are going to source these from farmers' cooperatives.

One of the bottlenecks in producing beer was that there was no local small-scale malt house. Barley for Dutch local beers is malted in Belgium. 'We are looking into the possibilities for setting up a small malt house,' says Verschuur.

In 2012, master's students at Van Hall Larenstein developed 17 business cases, of which seven have now been realised. In addition to developing spelt beer and spelt bread, a local cooperative has been set up, and footpaths and cycle routes along farm shops have been marked out.

Verschuur says it's important that these business cases really do enable farmers to create added value: 'Sustainability is not just about planet and people, but profit needs to be in there too. If the farmers are forced to do these things, they won't participate. That's the case in India, but also in the Netherlands.'



Chains and business models: dairy cattle in India

Project:

Frugal technology

Frugal technology is technology that is relatively simple, robust and affordable for the poor. The Sustainable Agribusiness in Metropolitan Agriculture professorship collaborates with the Centre for Frugal Innovation in Africa, a joint undertaking between the universities of Leiden, Delft and Rotterdam. The professorship has performed a study of adapted cowsheds for the dairy project in India. Sheds usually have corrugated iron roofs, which makes them very hot and causes heat stress for the cattle. Together with industrial designers from Saxion University of Applied Sciences, a new type of roofing material was tested, made from locally available jute and epoxy resin.

Demand for milk is growing in India, but medium-sized dairy farmers don't have the right technology for their operations. The professorship of Sustainable Agribusiness in Metropolitan Agriculture mapped the chain and is studying how farmers can acquire suitable technology and what business models fit their needs.

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With a rapidly growing population there is a shortage of milk in India at the moment, and this offers opportunities for the eight dairy farmers in Baramati that are being followed in the professorship's RAAK project. But the price of milk remains low. The entrepreneurs have between twenty and fifty cows, but not the right kind of technology for the way they farm. Bigger farmers can invest in high-tech cowsheds and cooling tanks, but these options are too expensive for the smaller farmers.

Farmers sell their milk to an Indian milk factory, which is a daughter of an American company. They can also sell their milk to a cooperative, or sell it directly to consumers. The farmers have no binding contracts and choose where to sell their milk on a daily basis. 'Some farmers go for growth and have their own milk tank from the milk factory. Some choose to work together with other farmers and share a milk tank,' says Ben Rankenberg, who teaches farm management and entrepreneurship and is coordinator of the Animal and Livestock Farming courses at Van Hall Larenstein. He is a regular visitor to India.

Metropolitan environment

The dairy farmers in Baramati are affected by the metropolitan environment in which they work, for example by the demands the city dwellers place on the quality and safety of the milk they drink. Other aspects relating to sustainability of production are little talked about in India, but they are a factor. Production that fits in the local context also needs to be sustainable.

For example, water shortages occur regularly. 'When there's a water shortage, the city's supply takes priority, so the dairy farmers only get what is left over,' explains Marise Haesendonckx, lecturer and coordinator of Marketing Researcher, Operations Management, Supply Chain Management and Logistics at Van Hall Larenstein. 'The drought is an issue for farmers. Sustainability requirements must be drawn up locally. You can't impose these as a project or as an outsider. People have to bring these things in themselves.' The requirements may come from consumers. For example, health and safety of milk are important issues for this group. 'But as yet there is little willingness to pay more for these,' says Ben Rankenberg.

The growth of dairy farming clashes at times with the religious significance of cows in India. Cows are holy for Hindus and are not allowed to be slaughtered, even if they are old and no longer producing milk. Marco Verschuur, coordinator of the Master's in Agricultural Production Chain Management, says that that is a big problem for dairy farmers. 'Sometimes the cows are just sent into the forest, or they live on the street, which is not ideal in terms of animal welfare.'

Project: An urban farm in Nanded City, India

We are assisting a project developer to design and develop a large urban farm of 77 hectares in Nanded City (Pune, India) as part of broader urban development initiatives. The farm is a mix of fruit and vegetable growing, combined with recreation and residential areas.



Competencies for companies

The work that the professor and the lecturer-researchers perform within the Sustainable Agribusiness in Metropolitan Areas professorship results in lessons about the competencies and skills that Dutch and international entrepreneurs need to be able to work in metropolitan agriculture.

Rik Eweg: 'Companies need a development-oriented attitude: they need to be prepared to develop their own market and to adapt their product to that market.' That requires patience and a realistic view of the opportunities and limits, based on a good analysis. The willingness to train people who are going to work with your product is also important. 'It requires commitment to a country, not just the business itself.' If a company is planning to invest in another country, it needs to develop a long-term vision of that investment and of its strategy in that country.

'Entrepreneurs planning to invest abroad need to realise that they will run into challenges. You have to embrace that, because you can learn from these experiences.' At the same time, researchers, government and other stakeholders must not forget that the bottom line for entrepreneurs is making money.

Innovation and learning for metropolitan agriculture

In many countries research, education and practice still take place largely separately. The Living Labs that the professorship of Sustainable Agribusiness in Metropolitan Areas has developed are networks within which businesses, government and researchers learn to work together towards solutions. The professor and the lecturer-researchers are the facilitators.

In its first four years, the professorship has built these unique networks – the Living Labs – for action research, shared learning and the development of skills for entrepreneurs. The Living Labs are based on the close and personal relationships between Van Hall Larenstein University of Applied Sciences and a number of universities and other higher education institutions in other countries: in India, the College of Agriculture and Allied Sciences, Baramati; in Serbia, the University of Agricultural Sciences and Veterinary Medicine in Novi Sad. The lecturer-researchers maintain relations by making frequent visits to these, and the many students who participate in the Living Labs for their research strengthen the relations. The professorship's smaller projects revolve around the studies that the students carry out, supervised by lecturer-researchers who contribute their own expertise and experience. Larger projects involve research that the professor and the lecturer-researchers conduct in collaboration with local businesses and researchers from local colleges, together with work done by students.

The professorship brings stakeholders together and inspires entrepreneurs, governments, local researchers and others to work together to develop new chains and new business models. Rik Eweg: 'We don't offer researchers ready-made research proposals. They have to think with us about their input and how it will contribute to innovations being put into practice. On the other hand, entrepreneurs also have to think for themselves about how they organise their business model. It's often about creating new markets, not just about selling existing products.' For many students and teachers in other countries, learning from the real world outside the school walls is still a new idea, and a university of applied sciences like Van Hall Larenstein has a lot of experience in this.

The professorship has built up solid experience in setting up Living Labs and collaborative learning in the field. Marise Haesendonckx, coordinator of Agribusiness and Business Administration: 'One of the lessons is that cooperation must always benefit all parties.' Professor Rik Eweg adds: 'Start by considering the interests of another party and only then consider how you yourself stand to gain.'

The Netherlands is famous for its consensus-based decision-making, says Eweg: parties with different interests consult and work with each other. 'We translate this way of working into the Living Labs: those in the networks learn collaboratively, and we develop competencies so that students and entrepreneurs can come up with smart solutions for sustainable agribusiness in metropolitan areas.'

Project: Poultry and fish in Kenya and Ethiopia

In Nairobi we are working on an agro-food Test Garden, aimed at developing new business opportunities for young Africans in the fish and poultry sector, for example raising insects for use as fish and chicken feed. In Ethiopia we are helping to develop dairy farmers' entrepreneurial skills and promoting market-oriented ways of working.



The future

Why we do what we do

Our work is to inspire new forms of learning by students, by inviting them to participate in solving problems and working with lecturer-researchers, entrepreneurs, governments and civil society organisations. In our vision, learning is not a one-way transfer of knowledge but a joint activity of all partners involved, in which each participant has a valuable contribution to make and can also develop him or herself.

Our activities are intended to contribute to making food production in and for metropolitan areas more sustainable. We see family farmers and small to medium-sized enterprises (SMEs) as the frontrunners in innovation and renewal. More than 500 million family farmers produce over 80% of the world's food. SMEs are often where new ideas and new enterprises are developed, and they are the partners of other local SMEs, often acting as path-breakers for or together with larger, international businesses.

In our view, the big challenge for these family farmers and SMEs is develop new forms of business and entrepreneurship within an urbanising environment, a globalising world market and conditions of climate change.

How we do this

We work as a group according to the principles of action research: together with stakeholders we analyse the problem, and develop and evaluate solutions. We develop prototypes and implement innovations based on their usefulness and the wishes of partners in the field. We work together with partners in Romania, Serbia, India, Brazil, Ethiopia and Kenya.

We commit ourselves to long-term involvement in regional networks called Living Labs in these countries. Trans-disciplinary collaboration and learning is based on trust, good relations and familiarity with local cultures and socio-economic relations. Where possible we mobilise expertise and technology from Dutch companies and knowledge institutions to address regional challenges in the Living Labs. In the next few years we also intend to encourage knowledge exchange between the different Living Labs.

What we offer

Through our research projects we develop sustainable business models for entrepreneurs seeking to build new chains that enable farm products to be produced in a sustainable way. Together with entrepreneurs we design the necessary expertise, technology and chains. We also establish contacts and together with stakeholders set up the chain to urban markets. In the Living Labs we work mainly with medium sized agro-entrepreneurs in the region.

Our Dutch partners also have access to our networks in the Living Labs and together with them we develop new business prospects, many involving the export of Dutch technology and expertise, linked to regional opportunities.

When developing business models and chains we devote attention to the 'hardware' needed (technological innovations needed by the business), 'orgware' (the organisation of cooperation structures and chains and the support required from suppliers and public agencies) and the 'software' (expertise and skills required by the entrepreneurs).

Our activities enable us to offer our partners:

- The possibility to learn jointly and develop new knowledge and skills in international, multi-cultural networks in the Living Labs, often with young people and unexpected partners;
- Practical and workable solutions to real-world problems;
- The development of new markets.

We invite entrepreneurs, students, governments, knowledge institutions and civil society organisations to work and learn together with us from a basis of mutual respect for all parties involved.

More information?

Rik Eweg

Telephone: + 31 6 41 14 95 08

E-mail rik.eweg@hvhl.nl

Facebook: facebook.com/ProfessorshipMetropolitanAgriculture

Twitter: twitter.com/rikeweg

Internet: www.hvhl.nl/sama and www.vhluniversity.com/sama

This brochure is based on a workshop in which Professor Rik Eweg discussed the results and plans of the professorship with the main Van Hall Larenstein lecturer-researchers involved:

- Marco Verschuur, coordinator of the Master's in Agricultural Production Chain Management
- Marise Haesendonckx, lecturer and coordinator of Marketing Research, Operations Management, Supply Chain Management and Logistics, and coordinator of the Agribusiness and Business Administration study programme
- Ben Rankenberg, lecturer in farm management and entrepreneurship
- Jan Hoekstra, lecturer in Sustainable Chain Development and Chain Empowerment
- Pauline Drost, lecturer Agro-food Supply Chain, Business Management and Technology

Brochure text: Joris Tielens

English translation: Sara van Otterloo-Butler

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Living Lab:

“Physical regions or virtual realities in which stakeholders form public private people partnerships (4Ps) of firms, public agencies, universities, institutes, and users all collaborating for creation, prototyping, validating, and testing of new technologies, services, products, and systems in real life contexts.”

(Westerlund and Leminen, 2011)

Photo top left to bottom right:

Rik Eweg, Ben Rankenberg, Jan Hoekstra, onder Pauline Drost, Marise Haesendonckx, Marco Verschuur.





**van hall
larenstein**

university of applied sciences



Leeuwarden

Agora 1
P.O. Box 1528
8901 BV Leeuwarden
The Netherlands
Telephone +31(0)58 284 61 00



Velp

Larensteinselaan 26a
P.O. Box 9001
6880 GB Velp
The Netherlands
Telephone +31 (0)26 369 56 95

info@hvhl.nl
info@vhluniversity.com

www.hvhl.nl
www.vhluniversity.com