



Applied research

VHL University of Applied Sciences



van hall larenstein
university of applied sciences

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Applied research at VHL University
of Applied Sciences

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Applied research at VHL University of Applied Sciences

VHL University of Applied Sciences (VHL) is a sustainable University of Applied Sciences that trains students to be ambitious, innovative professionals and carries out applied research to make a significant contribution to a sustainable world.

Together with partners from the field, we contribute to innovative and sustainable developments through research and knowledge valorisation. Our focus is on circular agriculture, water, healthy food & nutrition, soil and biodiversity – themes that are developed within research lines in the various applied research groups. These themes address the challenges that are part of the international sustainability agenda for 2030: the sustainable development goals (SDGs). This booklet contains fascinating and representative examples of projects – completed or ongoing, from home and abroad – that are linked to the SDGs. The project results contribute not only to the SDGs but to our teaching as well.

Under professorial supervision, research questions from the professional field are answered. Where necessary, researchers can make use of Van Hall Larenstein's research facilities – the Food Application Centre for Technology (FACT), the Water Application Centre (WAC) and the Dairy Campus facilities. Van Hall Larenstein also collaborates with the public and private sector in Living Labs, where research and innovation occur in parallel in keeping with the principles of co-creation and participatory design. We develop new products, while at the same time influencing the behaviour of end-users by having them directly involved and giving them new opportunities.

Please contact us if you have a research question that you would like our help with.

July 2020
Leeuwarden and Velp



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Circular agriculture



PROFESSOR:

Wiepk Voskamp-Harkema,
Sustainable Dairy Farming

PROJECT DURATION:

2015 - 2019

PUBLIC FUNDING:

26,000 euros

PRIVATE FUNDING:

26,000 euros

PROJECT PARTNERS:

Agrifirm, De Heus,
ForFarmers,
ABZ Diervoeders, DLF,
DMS, CONO, dairy farmers,
Aeres University of Applied
Sciences Dronten, VHL



Improving grassland management practices

The issue

In the Dutch dairy farming sector, there are large differences in grass production and utilisation between dairy farms.

It is expected that in the future it will become increasingly important in the future to make the most of the grass potential. This is because of the importance of low costs, the desire among government, consumers and industry for more regionally produced raw materials in food, and climate change.

The project

The aim was to develop a tool for dairy farmers and their advisors to give them a better understanding of improvements that could be made on the farm in terms of pasture production and utilisation. This would encourage dairy farmers to take concrete steps to optimise their pasture management and thus be able to respond to the aforementioned developments.

Deliverables

A digital tool that utilises farm-specific metrics entered by farmers to tell them how their farm scores on the six different aspects of pasture production and utilisation: grass, grazing, feed production, conservation, soil and fertilisation. The scores reveal the areas where improvements need to be made.

A completed prototype was presented at the international EGF-EUCARPIA Joint Symposium 2019 in Zurich, where it was well received, particularly by experts in north-western Europe.

The prototype has since been tested in France as well. In 2020, Terra students have used the prototype on their internship farms.

Sustainable meat, naturally!

The issue

Consumers increasingly value sustainable food and a clear recognition of this food on supermarket shelves. Although many quality labels have been developed in recent years based on various aspects of sustainability, it is difficult to combine issues such as animal welfare, climate impact and the impact on landscape, nature and biodiversity into a product sustainability score. The product with the smallest footprint is not always the most sustainable option, hence the need for a comprehensive overview of the sustainability impact of food production systems.

The project

The aim is to provide a comprehensive overview of quality labels, metrics and sustainability criteria for livestock farming that reflects consumer wishes and clearly shows areas of tension between farmer and consumer. On the basis of the overview, a roadmap will be created to further develop existing labels with respect to criteria, methodology and allocation in order to meet the information needs of livestock farmers, consumers and business customers. While all sectors in the meat-producing livestock sector are included in the project, the particular focus is on the sustainable production of beef.

Deliverables

The project will provide: (1) a summary table of quality labels and associated sustainability criteria, metrics and their appeal in practice, (2) a roadmap to develop sustainability metrics, including monitoring and a communication strategy, (3) an overview that gives farmers, business customers and consumers information on indicators and the requirements guaranteed by safety labels, as well as guidelines for an integrated vision that takes account of the different needs and interests of the different parties, and (4) a joint development agenda and best practices manual for the education and training of students and staff about different factors.

This research is co-financed by the Taskforce for Applied Research SIA of the Dutch Research Council (NWO).



PROFESSOR:

Wiepk Voskamp-
Harkema, Sustainable
Dairy Farming

PROJECT DURATION:

2019 - 2021

PUBLIC FUNDING:

299,969 euros

PRIVATE FUNDING:

112,120 euros

PROJECT PARTNERS:

Stichting Milieukeur, LTO
Noord, LLTB, ZLTO, Aeres,
InHolland, HAS, Stichting
Goedewaar, Bioboerderij
't Schop, Connecting
AgriFood, Delflandse
Vleesmeesters,
De 4 Vennekeshoeve,
De Oosters VoF, Esbro BV,
Eytemaheert, Heihoef
Farming BV, Heijdra
Vleesvee, Hoogeveld BV,
Natuurvlees NL/Meat
concepts, Natuurlijk
Vleespakket BV/Vleesch
& Co, Natuurkoeien,
True Food, Ulsda Food BV/
Hamletz, Vion NV,
Boer en Natuur, Dieren-
bescherming, Food Hub,
Natuur & Milieu Overijssel,
WWF-NL, Wageningen
University & Research





Long-term test of E-LUCI in practice

The issue

E-LUCI is a three-year Eurostars project in which international SMEs joined forces with knowledge institutions. Mastiline BV, The Sensor Factory and Biothema AB partnered with Van Hall Larenstein to develop a measuring system for the direct online monitoring of somatic cell count (SCC) in milk while still in the shed. By measuring somatic cells, the health of individual cows can be monitored in real time. The measuring system is self-calibrating and is based on an optical measurement technique in which the milk is mixed with a reagent.

The project

Van Hall Larenstein was responsible for administering a long-term test using the E-LUCI system. We tested how the system worked at two dairy farms over a one-year period, with dairy farmers reporting on their experiences. At the same time, regular checks were made on the correlation between the E-LUCI measurements and the regular milk control data (gold standard) and a database was created that can be used to develop a model for the early detection of mastitis.

Deliverables

The practical test provides the manufacturer with information about how the E-LUCI system functions in practice. This information can be used for further product development and presentation. The test also provides a controlled dataset that can be used for modelling.

PROFESSOR:

Kees Lokhorst, Herd Management and Smart Dairy Farming (applied research group ended in September 2019)

PROJECT DURATION:

2017 - 2019

PUBLIC FUNDING

64,000 euros

BUDGET PROJECT:

1,174,000 euros

PROJECT PARTNERS:

Commissioned by Mastiline BV and co-financed by Eurostars project 11295

RESEARCH TEAM:

VHL, in liaison with Mastiline and Wageningen Livestock Research



Innovations for dairy farm management in India

The issue

India is the world's largest milk producer. The milk is produced by 60 million dairy farmers, the majority are small and medium-sized family farms. A growing urban population, higher incomes, increased consumer awareness, changing lifestyles and higher expenditure on influencing health behaviours are all factors that have led to growing market demand. Dutch companies and knowledge institutions have proven know-how and a wide range of products and services that can benefit the Indian dairy sector in terms of improvements to cowsheds, milk production and milk quality.

The project

Researchers and students from Van Hall Larenstein, Saxion University of Applied Sciences and Baramati College of Agriculture and Allied Sciences collaborated with ten Dutch companies, Indian companies and eight innovative farms in the Pune district in the state of Maharashtra to develop robust and affordable technologies and knowledge for medium-sized Indian dairy farms in the Pune district. The project also developed innovations in farmers' business models and value chains.

Deliverables

The project yielded a number of innovations for dairy farm management, such as shed design to reduce heat stress and the introduction of maize silage (produced and sold in bales) as feed. A registration system for milk production was launched to provide information on the genetic potential of the herd. To ensure sufficient capacity for investment in innovative technologies, new value chains and business models were designed, focusing on quality management, untouched milk and short (producer-consumer) chains for A1 and A2 milk. The study concluded with advice to Dutch companies wishing to explore opportunities in the Indian market for small and medium-sized dairy farmers and to enter or expand this market.

PROFESSOR:

Rik Eweg, Sustainable Agribusiness in Metropolitan Areas

PROJECT DURATION:

2015 - 2017

PUBLIC FUNDING:

300,000 euros

PRIVATE FUNDING:

300,000 euros

PROJECT PARTNERS:

VHL, Saxion, Baramati College, Gea Farm Technologies, Vetvice, Cowsignals, Uniform Agri, Wytze Nauta Advies, CRV, Vision4Energy, Nedap, Dutch Rainmaker, Agriprom

This research was co-financed by the Taskforce for Applied Research SIA of the Dutch Research Council (NWO).



PROFESSOR:

Robert Baars, Climate-Smart Dairy Value Chains

PROJECT DURATION:

2017 - 2018

PUBLIC FUNDING:

25,000 euros

PRIVATE FUNDING:

5,000 euros

PROJECT PARTNERS:

Federal University of Viçosa (Brazil), Groasis, Alfa Genetics, VHL



Exploratory research on investment opportunities for a circular economy at dairy farms in Minas Gerais, Brazil

The issue

The dairy chain in Minas Gerais (MG), Brazil offers enormous investment potential for the private sector. However, in attracting and consolidating partnerships, there are a number of challenges, such as soil erosion, drought and climate change. In order to develop a circular dairy economy, it is vital to gain a better understanding of the demands, challenges and opportunities of interested companies.

The project

The project involved two exploratory studies on behalf of private sector partners. The principal investigators were fourth-year Bachelor's students from Van Hall Larenstein. The first study looked at market and investment opportunities in the circular dairy sector, and the second at market and investment opportunities for Groasis BV to support agro-silvo-pastoral dairy farming (agro-silvo-pastoral systems are ones that entail the pasturage of animals in a forested environment).

Deliverables

The first study showed that foreign companies have to contend with a range of issues: 1) it is extremely time-consuming to obtain import licences, 2) import regulations are constantly changing, 3) the Brazilian currency (the real) is subject to enormous fluctuations, 4) local politics are unpredictable, (5) agreements are not respected unless formally signed, and 6) too much hinges on the attitude of the official handling the application. Added to that, Dutch technologies are developed for farms with 100 or more cows, whereas the small to medium-sized dairy farms in MG have 10 to 60 cows. The second study showed that most farms benefit from switching to an agro-silvo-pastoral system, a switch that can also be made without using the (relatively expensive) Growboxx or Waterboxx. However, the agro-silvo-pastoral system is often seen as more labour-intensive than the traditional system.

Inclusive, climate-smart business models for Ethiopian and Kenyan dairy chains

The issue

The CCAFS project 'Nationally Appropriate Mitigation Actions' (NAMA) supports stakeholders to set up and test activities for reducing greenhouse gas emissions from dairy production in Kenya. Despite the many initiatives, good practices are still not being sufficiently scaled up to further develop the Kenyan dairy sector.

The project

The aim of this research project is to describe the business models of chain actors and supporting parties in order to identify opportunities for the scaling-up of good climate-smart practices. Six case studies relating to the dairy chain have been selected, three in Kenya and three in Ethiopia, each with a different level of market orientation. Three PhD students are acting as principal investigators, for two of the selected chains each.

Deliverables

Business models will be described for each of the six chains and adapted for three to four actors (suppliers, dairy farms, dairy associations or cooperatives, and dairy processors), as well as for one influential support party in the chain. The adapted models will clearly indicate which feasible adjustments the actors need to make, and which adjustments are needed that are outside the actors' control. Both the perspective of the actors themselves and the expectations of other stakeholders will be explored. There are about 25-30 business models in total, plus six comparable situations spread across the two countries for each actor. An overall analysis of the results of the six case studies will result in indicators that can be used for scaling-up.



PROFESSOR:

Robert Baars, Climate-Smart Dairy Value Chains

PROJECT DURATION:

2018 - 2021

PUBLIC FUNDING:

250,000 euros

PRIVATE FUNDING:

250,000 euros

PROJECT PARTNERS:

Michigan State University (US), United States International University – Africa (Kenya), Jimma University (Ethiopia), AgriProFocus (NL), UNIQUE forestry and land use (Germany), VHL (NL)



PROFESSOR:

Astrid Manhoudt,
Meadow Birds, and Wiepk
Voskamp, Sustainable
Dairy Farming

PROJECT DURATION:

2017 - 2020

PUBLIC FUNDING:

400,000 euros

PRIVATE FUNDING:

67,000 euros

PROJECT PARTNERS:

ELAN, Westergo,
Noordelijke Friese
Wouden, Louis
Bolk Institute,
De Vlinderstichting,
Dairy Campus, CoE
AgroDier, Ministry of
Agriculture, Nature and
Food Quality, Province
of Friesland and VHL

*This research was
co-financed by the
Province of Fryslân.*



Cows, herbs and biodiversity

The issue

Agricultural intensification has led to a significant reduction in farmland biodiversity. This has a direct impact on nature and our landscape, as well as on the agricultural system. The creation of monocultures leads to lower resistance to the disruptions caused by weather extremes (heavy rainfall, droughts) and pests (e.g. infestations of mice). Recent years have seen a growing interest among agricultural producers in herb-rich grassland and in biodiversity in dairy farming. Currently, however, there is limited practical knowledge among dairy farmers about establishing and managing herb-rich grassland and about its costs and benefits.

The project

To facilitate the use of herb-rich grasslands, this project has: (1) mapped out the advantages and disadvantages of herb-rich grassland, (2) shared knowledge and experience among dairy farmers and students about establishing and managing herb-rich grasslands, and (3) documented the added value of herb-rich grassland for cows and farming operations, and for insects and meadow birds. The project also involved making a start on expanding the area of herb-rich grasslands in Friesland.

Deliverables

A practical guide containing management advice on (a) the establishment and management of herb-rich grassland for cows, insects, soil organisms and meadow birds, and (b) the integration of herb-rich grassland into the ration of dairy cows and the advantages and disadvantages of herb-rich grassland for the farm system, cow health and meadow birds. The newly acquired knowledge and experience have been actively shared with dairy farmers in the agricultural collectives through meetings of the study group, field workshops and a symposium. Based on the knowledge gathered from the best-practice farms, demo farms and the 'mixtures and management' experiment, the manual provides guidelines on sowing methods, seed-mixture suitability for cow health and/or meadow birds, management and the fertilisation regime.

Farm LIFE: towards a climate-adaptive agroforestry

The issue

The Netherlands is witnessing a gradual but steady impoverishment of the landscape. With its focus on intensive, input-oriented crops in a monoculture context, traditional agricultural policy has reduced the capacity of farms to cope with extreme weather events. This was apparent in June 2016 when heavy rainfall flooded large areas of agricultural land in the south of the Netherlands and in Flanders, resulting in considerable crop damage and failed harvests. This highlights the need for the agricultural sector to become more resilient to climate change, which calls for drastic changes to agricultural policy and practice.

The project

The Farm LIFE project aims to create an environment in which farmers, agricultural organisations, entrepreneurs, knowledge institutions, ministries and social partners can exchange practical knowledge and tools that will directly facilitate the transition from conventional monocultures to climate-adaptive forestry. To this end, the target group is being encouraged to organise itself into rural networks that will continue beyond the life of this project. In addition, a transition toolkit is being created for these networks to effectively implement the transition to climate-adaptive forestry or agroforestry. This toolkit will include tools both for the development of adaptive agricultural plans that can be contextualised in different circumstances and for value creation to make agroforestry-based food products more competitive.

Deliverables

Farmer-driven business networks with a focus on sustainable agricultural value chains, in which knowledge is shared and the transition toolkit is used in the transition to climate-adaptive forestry. These networks could also be extended to the whole of the Netherlands, to Belgium and other European countries, where knowledge could be exchanged about the transition to climate-adaptive forestry and the necessary tools.



PROFESSOR:

Eurídice Leyequién Abarca, Management of Forested Landscapes

PROJECT DURATION:

2018 – 2023

PUBLIC FUNDING:

1,463,570 euros

BUDGET CONSORTIUM:

975,717 euros

PROJECT PARTNERS:

Bosboom BV, Boefkik BV, Flanders Research Institute for Agriculture, Fisheries and Food (ILVO), Horst Beheer BV, Stichting Landgoed De Koekoek, Forestry Service Group BV

The Farm LIFE project (LIFE17 CCA/NL/000093) is funded by the LIFE EU programme.



PROFESSOR:

Eurídice Leyequién
Abarca, Management of
Forested Landscapes

PROJECT DURATION:

2019 - 2023

PUBLIC FUNDING:

512,300 euros

BUDGET CONSORTIUM:

512,300 euros

PROJECT PARTNERS:

Aliet Green BV,
Aidenvironment,
Indonesian Ministry of
Agriculture

*This Sugar & Steam
project is funded by the
Ministry of Foreign Affairs
through the SDGP
Partnership Facility.*



Increasing efficiency in production systems for climate-adaptive forestry in Indonesia

The issue

Small organic coconut producers in Kulon Progo have a consistently low productivity. Subsistence farming, and therefore poverty, are common as a result of poor land management, the absence of climate-smart agriculture, and more extreme weather events. Faced with the growing international demand for alternative natural sweeteners, the company Aliet Green wants to turn the tide by working with farmers from the Kokap district in Kulon Progo.

The project

The aim of the Sugar & Steam project is to improve the incomes, productivity and climate resilience of 2,000 farmers by on-farm practices and technologies. This will entail better working conditions and ethical working procedures throughout the value chain. Gender-sensitive planning and mainstreaming is an overarching priority of the project. Climate-adaptive good agricultural practices will be developed and tested. Farmers will be trained in adaptive farming methods, which will be developed and validated through participatory research on farms. The project will also deliver materials for the dissemination of knowledge and innovation.

Deliverables

Innovative, climate-adaptive, on-farm technologies as part of a sustainable and profitable model for farmers. There has been a 20% increase in productivity among the participating farmers, who adhere to the principles of organic farming and whose value chain is part of the circular economy. Farmers have guaranteed capacity in diversified production systems and have higher and secure incomes through fair and transparent contract agreements. Participating households are recognising the benefits of improved soil and water management. The district is seeing a 2600 FTE increase in additional work, and women are having a greater influence on political decision-making. The value chain in the area ensures a) a safe and climate-resilient supply of raw materials and (b) the necessary structures before and after the harvest.



Developing a regional circular bioeconomy and transforming rural areas into prosperous, smart, specialised regions in the North Sea area

The issue

The North Sea region is one of the most prosperous parts of the European Union, but most of the economic activity and growth occurs in urban areas. The region's rural areas are experiencing a steady population decline. Young, highly educated inhabitants are migrating because of the lack of jobs and entrepreneurial opportunities, leading to negative economic growth in many rural areas. However, the countryside boasts a wealth of agricultural expertise, there are abundant (surplus) quantities of biomass from many different sources, and there is land and space available to develop smart specialisations of biobased products. This could provide opportunities to break out of the negative economic growth in this region.

The project

The BIOCAS project seeks to initiate the development of a regional circular bioeconomy and to transform rural areas into smart, specialised regions for the integrated and local valorisation of biomass, based on cascade principles. Biomass Cascading Alliances (BCAs) include all the players involved in the biomass value chain (raw material > processing > product + waste streams/ raw material), which means that biomass can be converted more sustainably. The BCAs are achieved by means of a 'triple helix' partnership between science, industry and government. This will kick-start the development of a strong regional circular economy in the rural parts of the North Sea region.

Deliverables

New biocascade technologies, an overview of the environmental and economic impact of cascade chains on biomass and provisional alliances.



ASSOCIATE PROFESSOR:

Jerke de Vries, Environmental Impact of Circular Agri- and Food Chains

PROJECT DURATION:
2017 - 2021

PUBLIC FUNDING:
2,484,620 euros

PRIVATE FUNDING:
2,484,620 euros

PROJECT PARTNERS:

Province of Fryslân, Hanze University of Applied Sciences Groningen, Limm Recycling, Rinagro, NHL Stenden University of Applied Sciences, VHL, Agrovi, CELF, Aarhus University, Business Lolland-Falster, Guldsborgund Municipality, University of Southern Denmark, World Perfect, University of Oldenburg, Landkreis Heidekreis, 3N Centre of Experts, KU Leuven and Ghent University



Healthy Food & Nutrition





Process optimisation to improve the nutritional value of milk powder

The issue

The production process for milk powder entails several heat treatment steps, which affect the nutritional value of the final product. Heat treatment may cause protein glycation in the milk, which then loses its nutritional value.

The project

The Go4Dairy project used laboratory-scale experiments to simulate part of the production process for milk powder. The results of these experiments will be used to develop a model that can predict the glycation level of milk protein during production.

Deliverables

A model that allows the various project partners to ultimately optimise their production process in order to improve the nutritional value of milk powder.

PROFESSOR:

Peter de Jong, Dairy
Process Technology

PROJECT DURATION:

2016 - 2020

PROJECT PARTNERS:

Dutch Dairy Chain,
FrieslandCampina, NIZO Food
Research, Vreugdenhil Dairy
Foods, VHL



**ASSOCIATE
PROFESSOR:**

Marije Strikwold, Safety
in the Food Chain

PROJECT DURATION:
2018

PUBLIC FUNDING:
20,000 euros

PRIVATE FUNDING:
20,000 euros

PROJECT PARTNERS:
CoE Agro Dier, including
VHL



Bioactive substances from herb-rich grassland in milk

The issue

There is a trend towards feeding dairy cows more herb-rich grass. This is prompted by sustainability principles, a wish to increase the nutritional value of dairy products and/or to improve the health of cows. Substances in the herbs can eventually end up in the milk. Some substances have already been investigated in this respect. The advanced analytical chemical equipment (LC-MS-TOF) at Van Hall Larenstein has been used to map out the relationship between feed composition and substances in milk in far greater detail.

The project

The project sought to find out more about the relationship between the composition of grasslands (grasses, herbs) and the composition of cow's milk, with a specific focus on the transfer of bioactive substances from herbs to milk. Sixteen dairy farms were involved in the pilot study. Together with researchers and students, we made a start on grassland inventories, milk sampling and analysing milk composition.

Deliverables

- A database of information on the herbs used in organic and conventional dairy farming, the related chemical composition and possible health effects.
- Identifying the differences between the composition of conventional and organic milks and the association with specific herbs.

Determining the sources of PAHs in herbs

The issue

Various herbs are grown in Europe or imported here and processed for food consumption and medicinal applications. European standards for the presence of polycyclic aromatic hydrocarbons (PAHs) in dried herbs came into effect in 2015. Since then, it has unexpectedly emerged that PAHs are present in various herbs, including ones from Europe, in concentrations above the maximum levels set by the EU for PAHs in dried herbs. In order to comply with the standards, it is important to identify the cause of these PAH levels.

The project

The research project aimed to identify the origin of PAHs in dried herbs and to come up with possible (PAH-reduction) measures and advice so that companies working in the herb sector could (continue to) supply products that meet the relevant standards.

Deliverables

- A chain analysis of the presence of PAHs in herbs
- An understanding of the transfer of PAHs from the soil to herbs, based on experimental research
- An understanding of the underpinnings and applicability of EU standards
- Advice on PAH-reduction measures to enable the (continued) supply of products that meet the relevant standards



ASSOCIATE PROFESSOR:

Marije Strikwold, Safety in the Food Chain

PROJECT DURATION:

2018 - 2019

PUBLIC FUNDING:

20,000 euros

PRIVATE FUNDING:

25,260 euros

PROJECT PARTNERS:

VNK Herbs, NPN, EUROPAM, VHL





New and clean label products

The issue

More and more people are looking for products that contain natural ingredients, such as clean label products or allergen-free (e.g. gluten-free). Companies want to respond to this trend and are working hard to adapt their product range, which has prompted a host of requests for product and process development.

The project

The project aimed to develop new, long-life and clean label sauces using new ingredients and processes. The focus was on allergen-free, a reduced sugar and salt content and antioxidants, while maintaining taste, texture and shelf life.

Deliverables

New clean label concepts and sauces for the consumer market.

PROFESSOR:

Lizette Oudhuis, Food Physics

PROJECT DURATION:

2016 - 2018

BUDGET:

230,000 euros, with 40% subsidy

PROJECT PARTNERS:

Oliehoorn, InHolland, VHL



Personalised food for older adults in Fryslân

The issue

Better nutrition helps older people stay healthy for longer. Together with exercise, good nutrition is important for maintaining muscle strength and fitness. If people find eating more difficult, this can lead to deficiencies and ultimately to malnutrition. Half of older adults lose some of their sense of taste and 60% some of their sense of smell. Older people are often found to be malnourished. A common reason for this is that they eat less because they no longer enjoy the taste as much.

The project

- Charting the nutritional intake and change in taste in the target group.
- Developing new product concepts, such as protein- and flavour-enriched breads and snacks.

Deliverables

New enriched consumer products for older adults.

PROFESSOR:

Lizette Oudhuis,
Food Physics

PROJECT DURATION:

2017 - 2019

BUDGET:

93,000 euros, with 60% subsidy, With 15,000 euros for Van Hall Larenstein

PROJECT PARTNERS:

Koopmans Meel, Bakkerij Breimer, Puur Thijs, Tante Luus, Maaltijdservice Antonius Ziekenhuis, Hanze University of Applied Sciences Groningen, VHL, Technologie Centrum Noord-Nederland



PROFESSOR:

Eric de Bruin,
Biobased Proteins

PROJECT DURATION:
2019**PRIVATE FUNDING:**
10,000 euros**PROJECT PARTNERS:**
Dutch Cannabis Processing (DCP) is supported by the Economic Board Arnhem-Nijmegen and the Province of Gelderland through the Gelderland bio-circular programme.

Hemp trial field

The issue

Hemp seeds contain proteins that are easily digested and contain all the essential amino acids. This explains why the seeds are sold so widely in the Netherlands as a superfood. However, the hemp proteins currently found on shop shelves are imported from Eastern Bloc countries such as Romania and Ukraine, making the product much less sustainable.

The project

The company DCP and Pantanova asked Van Hall Larenstein to investigate the ideal hemp species for cultivation in the Netherlands. The project looked primarily at the ultimate protein content in the seeds of four different hemp varieties (which feature male and female flowers on separate plants). Two test fields were created, one in East Groningen and one in Velp. The plants thrived on organic fertiliser. The test field in Velp also used worm compost produced on site using worm containers.

Deliverables

Advice on the ideal hemp species for sustainable cultivation in the Netherlands, taking into account the ultimate protein content in the seeds. The project also provided information on ideal growing conditions. As well as providing high-quality proteins, hemp has other applications. For example, the woody parts of the plant can be used as a biobased building material and the plant fibres are a renewable raw material for paper, rope and textiles.



Pulp Vision: valorisation of pulp fraction from the onion waste stream

The issue

The Dutch onion sector produces 1.5 million tonnes of onions annually. The cultivation and processing of onions generate a waste stream of more than 0.5 million tonnes a year. Onion growers and the processing industry have joined forces with knowledge institutions to establish a process that will add value to this stream. The focus is on maximising the separation of aroma and flavour compounds, proteins and fibres. While the first two streams are already being used in a range of applications, the fibre-rich pulp fraction is still being sent to biofermentation plants, which places it in the category of very low value creation.

The project

The Pulp Vision project is looking at the valorisation of the pulp fraction into a high-quality end product. The fibres from the pulp fraction are an excellent source of soluble and non-soluble dietary fibres that can be used to promote gut health. The technical challenge for the project is to remove the onion's aroma compounds so that the onion taste cannot be detected in foods that are enriched with these fibres.

Deliverables

The successful implementation of this project will provide a new source of dietary fibre along with knowledge about the biorefining of onion waste. The high-quality dietary fibre can be used as a raw material to enrich existing foods or to develop new products. The project will also investigate the impact of these products on gut health. This will provide information on the optimal application of the fibres from a health perspective.



PROFESSOR:

Eric de Bruin,
Biobased Proteins

PROJECT DURATION:

2020 - 2022

PUBLIC FUNDING:

300,000 euros

PRIVATE FUNDING:

300,000 euros

PROJECT PARTNERS:

NMK Esbaco, Fresh
Monkeys BV, VAMO,
Biorefinery Solutions,
Gourmet, Wiskerke
Onions, VHL, Inholland

*This research is
co-financed by the
Taskforce for Applied
Research SIA of the Dutch
Research Council (NWO).*



Water



Better Wetter

Future-adaptive water management for peatland meadows

The issue

Current water management practices in agricultural areas generally aim to keep water levels low. In peatland meadows in particular, this situation is not future-proof because of the impact on peat oxidation, soil subsidence, CO2 emissions and the leaching of nutrients, which puts pressure on many ecological values. In addition, water storage capacity is continuing to decline, at a time when climate change requires an increase in this capacity.

The project

The Better Wetter partnership is investigating new forms of water management, based on rewetting and on fluctuating water levels. Rewetting can halt peat oxidation and soil subsidence. It also offers potential for storing and retaining water in an area, for improving water quality and for restoring ecological and landscape values. The project will develop viable concepts for sustainable agriculture and land use, in both technological and socio-economic terms.

Deliverables

The first phase of the project (RAAK-Publiek) yielded the following deliverables for water managers, planners, nature managers and other professionals involved: an analysis of the water system, a climate stress test, a guiding model for retaining water and keeping it clean, a 3D animation on innovative and promising solutions, and a participatory manual with design guidelines, descriptions of experiences and future scenarios for the area. The second phase involves work on scaling up wet agriculture (paludiculture) and developing revenue models for this.

PROFESSOR:

Peter van der Maas,
Sustainable Water Systems

PROJECT DURATION:

Phase 1: 2015 – 2018

Phase 2: 2019 – 2021

BUDGET:

Phase 1: 600,000 euros,
with 50% subsidy

Phase 2: 844,427 euros
(with the municipality
of Dantumadiel as
coordinator), 60,000 euros
of which is earmarked for

Van Hall Larenstein,
with a subsidy from the
Province of Fryslân under
the Feangreidefyzjet
implementation
programme.

PROJECT PARTNERS:

VHL, Wetterskip Fryslân,
municipality of
Dantumadiel, Noardlike
Fryske Wâlden, Altenburg &
Wymenga, Nordwin College,
Province of Fryslân,
It Fryske Gea, Friese Milieu
Federatie, Staatsbosbe-
heer, Ondernemers
Federatie Noordoost
Fryslân, Kenniswerkplaats
Noordoost Friesland





Water reuse in the pulp and paper industry in Brazil

The issue

A pulp factory in Brazil that uses water from the Doce River would like to minimise its use by exploring ways in which water can be reused in the pulp-making process. Ultrafiltration systems can be used for this purpose.

The project

The project entails shipping an ultrafiltration system from the Water Application Centre by container to Brazil, where it will be tested in the production process under various conditions.

The project involves several companies and research institutes in Brazil and the Netherlands.

Deliverables

At the end of the project, the group expects to have a better understanding of the various options in the use of ultrafiltration systems and the implications for the factory's water demand and water reuse.

PROFESSOR:

Luewton Agostinho, Water Technology (NHL Stenden University of Applied Sciences)

PROJECT DURATION:

2018 - 2020

PUBLIC FUNDING:

470,000 euros

PRIVATE FUNDING:

150,000 euros

PROJECT PARTNERS:

NHL Stenden University of Applied Sciences, VHL, Berghof, Cenibra, HZ University of Applied Sciences, SENAI and Universidade Federal de Viçosa.



Use of electrohydrodynamic atomisation systems to improve odorization in natural gas networks during off-peak periods

The issue

Because natural gas is odourless, an odorant is added to the gas so that people can smell gas leaks when they occur. The odorant, a liquid such as tetrahydrothiophene (THT), is injected into the gas flow in very small quantities in proportion to the level of gas flow. A common problem is that at times of low gas flow, as happens in summer, there is insufficient gas velocity to properly atomise the odorant. In the current production method, it is not possible to fully regulate the diameter of these droplets, a problem that electrohydrodynamic atomisation (EHDA) can solve.

The project

This project has developed, produced and tested a new EHDA odorization system. The group from Van Hall Larenstein and the Water Technology applied research group at NHL Stenden University of Applied Sciences collaborated with experts from Gasunie and Frisian production companies. The EHDA system is designed to manipulate the formation of THT droplets in natural gas odorization systems by regulating the diameter and number size distribution. The system was first tested (and approved) on a laboratory and pilot scale, followed by large-scale testing in practice.

Deliverables

The final product was a new EHDA odorization system to improve the odorization level in natural gas networks during off-peak periods (in summer). The system was developed entirely by Van Hall Larenstein and NHL Stenden University of Applied Sciences in collaboration with Gasunie and Frisian production companies.

PROFESSOR:

Luewton Agostinho,
Water Technology
(NHL Stenden University
of Applied Sciences)

PROJECT DURATION:

2013 - 2019

PUBLIC FUNDING:

250,000 euros

PRIVATE FUNDING:

250,000 euros

PROJECT PARTNERS:

Gasunie BV and Centre
of Expertise Water
Technology (CEW),
including VHL and
NHL Stenden University
of Applied Sciences



PROFESSOR:

Jeroen Rijke, Sustainable River Management (applied research group ended in April 2020)

PROJECT DURATION:

2018 - 2020

PUBLIC FUNDING:

170,000 euros

PROJECT PARTNERS:

Rijkswaterstaat-Oost Nederland, Province of Gelderland, Natuurmonumenten, HAN University of Applied Sciences, Helicon and VHL



Circular floodplain management: vegetation and sediment management in the Rivierklimaatpark

The issue

When it comes to large-scale area development, such as redesigning a floodplain, it might seem logical to first consider the area's layout before discussing how to manage it. However, from the point of view of a circular economy and sustainability in general, this is not always the right approach. For example, when a floodplain is managed, (residual) biomass is released that can serve as a raw material for new products. In order to utilise these raw materials, potential management measures must be considered earlier in the planning process, so that demands can also be made on an area's layout from a management perspective.

The project

The project objective was to explore how sustainable area management can be incorporated into development and design projects at an earlier stage. The case studies that we investigated were vegetation and sediment management, which called for new models for the management of riverbeds and floodplains. These models were investigated in the context of the Rivierklimaatpark IJsselpoort.

Deliverables

The project contributed to the area vision for the Rivierklimaatpark IJsselpoort in terms of circular and sustainable management. It also provided a guide to circular floodplain management for a wider audience. A serious game, *Terreinbeheerspel* (Area Management Game), based on the concept of the circular economy, was developed as a teaching aid. The project concluded with a final symposium in which the knowledge and experience gained was made accessible to government authorities, NGOs, private parties and educational institutions.

SteenGoed

Building blocks for an integrated approach to flood-free land

The issue

There are about 80 (former) brick factory sites in Gelderland that have largely fallen into disuse and in many cases are turning to ruins. Repurposing these sites can make a substantial contribution to vitality, safety and climate adaptation in the river area. This is because these flood-free areas located outside the dykes remain largely dry when the Gelderland rivers are running high. The question is how to (re) develop these flood-free areas, taking into account both the potential of individual sites and the integrated development of the entire river area.

The project

The aim of the SteenGoed project is to offer policymakers, business owners and managers in the Gelderland river area possibilities for action so that they can make informed choices about the (re)development of flood-free areas in the short, medium and long term. This involves an integrated approach to flood safety, natural values, economic prospects and cultural history, resulting in a broad-based development strategy, backed up by representative pilot studies, including business cases that can serve as examples and inspiration for the other areas.

Deliverables

A database has been created for the professional field, containing all the available knowledge about flood-free areas, such as natural values, cultural values, economic values, water safety aspects and soil contamination. This database can be used to develop pilot studies and scenarios. At universities of applied sciences, knowledge is increasing among lecturers and students about the sustainable and integrated development of the river area in the future, which will lead to an improvement in curriculum quality.

PROFESSOR:

Jeroen Rijke, Sustainable River Management (applied research group ended in April 2020)

PROJECT DURATION:

2018 - 2020

PUBLIC FUNDING:

116,000 euros

PRIVATE FUNDING:

136,000 euros

SUBSIDY:

105,000 euros

PROJECT PARTNERS:

VHL (KCNL), Province of Gelderland, Rijkswaterstaat, Rijksdienst voor Cultureel Erfgoed (RCE), Staatsbosbeheer, vereniging Koninklijke Nederlandse Bouwkeramiek (KNB), HAN University of Applied Sciences and Helicon

This project was co-financed by the Province of Gelderland.



PROFESSOR:

Hans Hopster, Animal Behaviour, Animal Health and Animal Welfare

PROJECT DURATION:

2017 - 2020

PUBLIC FUNDING:

300,000 euros
(RAAK-Publiek)

PRIVATE FUNDING:

324,000 euros

PROJECT PARTNERS:

Altenburg and Wymenga, University of Amsterdam, International Wildlife Services, SODAQ, Sense for Innovation, Saxion University of Applied Sciences, University of Twente, VHL

This research was co-financed by the Taskforce for Applied Research SIA of the Dutch Research Council (NWO).



Focus on dyke diggers: their burrowing behaviour and territorial use

The issue

The burrowing activities of coypus, muskrats and beavers cause damage to the banks of flood defences. This destabilises the banks, resulting in significant risks to water safety as well as economic damage. With sea level rise and soil subsidence, this burrowing in banks and essential flood defences has become a major risk. Because they have no natural enemies, beavers and muskrats are subject to intensive control measures in the Netherlands. The native beaver, however, is protected and, having become extinct in the Netherlands, was successfully reintroduced into the wild in 1988. Since then, the beaver population has grown significantly. It is not clear how much digging damage the beavers cause.

The project

The project charted the burrowing behaviour and territorial use of coypus, muskrats and beavers in the Netherlands by equipping them with innovative LoRa transmitters with sensors. This will help to better underpin control policies and management measures and lead to new measures for beaver management.

Deliverables

Cost-effective management of the damage to banks and flood defences caused by dyke diggers, taking account of animal welfare, other natural values and minimising by-catch.



Citizen participation in climate adaptation

The issue

Standards and/or acceptance limits for rainfall, heat and drought in urban areas are increasingly being exceeded as a result of climate change. Municipalities and water authorities are tasked with ensuring climate-adaptive planning and development. Collaboration with local inhabitants is an essential part of this process. In order to take steps towards implementation, municipalities and water authorities need to know about: (1) impacts at the micro level (streets/buildings), (2) local citizen experiences, and (3) how citizens can be involved in the measures.

The project

The aim is to develop a practicable method for citizen participation in climate adaptation. The research will be conducted in five cities, including Leeuwarden, using various approaches from citizen science. Professionals and local inhabitants will jointly carry out measurements (participatory monitoring), collect data on physical and social vulnerability in a short period of time and develop measures.

Deliverables

The result will be a practicable method for citizen participation in climate adaptation.

PROFESSOR:

Peter van der Maas,
Sustainable Water Systems

PROJECT DURATION:

2019 - 2021

PUBLIC FUNDING:

600,000 euros
(50% subsidy)

PROJECT PARTNERS:

HZ University of Applied Sciences, Hanze University of Applied Sciences Groningen, VHL, Rotterdam University of Applied Sciences, municipalities of Leeuwarden, Groningen, Rotterdam, Vlissingen and Middelburg, Wetterskip Fryslân, Waterschap Noorderzijlvest

This research is co-financed by the Taskforce for Applied Research SIA of the Dutch Research Council (NWO).



PROFESSOR:

Derk Jan Stobbelaar,
Sustainable Landscape
Management

PROJECT DURATION:

2017 - 2019

PUBLIC FUNDING:

50,000 euros (schools)
and 50,000 euros (KCNL)

PRIVATE FUNDING:

50,000 euros

(professional field)

PROJECT PARTNERS:

Inholland, Wellant
college, Free Nature,
Gebroeders Van Kessel,
Bureau Waardenburg,
Rijkswaterstaat, VHL



Vision for the Noordwaard

The issue

About five years ago, the Noordwaard, an area of some 4,450 hectares adjacent to the Nieuwe Merwede River, was redesigned as a high-water flood area. The dyke along the river was lowered to a height of 2m above NAP, allowing the Noordwaard to be inundated several times a year. Various large grazing animals ensure an open vegetation so that the waterflow is maintained. Any excess vegetation is mowed before the winter. In addition to the flood function, the area should also be of significance for nature, recreation and the green economy. It is currently unclear how these different functions will reinforce or counter each other and how this can be optimised in the future.

The project

The project aimed at an integrated vision of how the Noordwaard functions. First, several supporting studies on drone images, flow models, people's experiences and ecosystem services were carried out. These showed how ecology, the economy and society (local residents and visitor appreciation) can strengthen each other and where they hamper one another. An integrated vision for the area was then created in an interactive process involving several stakeholders.

Deliverables

An integrated vision to show the different user groups of the Noordwaard how the management and use of the area can be optimised. A flow model was used to demonstrate that water flow can be guaranteed in the absence of a mowing regime, which has resulted in a temporary change in policy. In addition, the project has confirmed that locals and visitors appreciate the large grazing animals and the area's openness. Problems were also identified, for example between residents and visitors in busy locations.

Peatland restoration to reduce carbon emissions

Wat is er aan de hand?

Natural peatlands play an important role in the earth's climate system. For thousands of years, they have regularly absorbed CO₂ from the atmosphere. Over the years, semi-decayed plant remains have ended up under water, causing the decomposition (rotting) to come to a virtual standstill. When peatland, which comprises 3% of the world's land surface, is drained, the peat dries, and CO₂ is released.

The project

The Carbon Connects project aims to promote alternative practices of wet agriculture land use that reduces CO₂ emissions by raising water levels and introducing new crops. Eight pilot sites of 3-10 hectares have been established in the Netherlands, France, Belgium, the United Kingdom and Ireland, which together represent all peatland types in north-western Europe. Carbon Connects will also produce financially viable business models by developing value chains and offering credit schemes to parties with a fairly low credit rating. This will enable widespread implementation and scaling-up without the need for government subsidies.

Deliverables

Solutions are scalable in north-western Europe to 4,500,000 hectares of peatland. Carbon Connects can achieve a reduction of 90-180 million tonnes of emissions in north-western Europe, which is equivalent to removing 40 to 80 million cars. Carbon Connects' transnational Farmer-2-Farmer learning programme allows land users to directly share and scale experiences, while actively targeting new adopters with a transnational toolbox of state-of-the-art land use and farming practices.



PROFESSORS:

Toine Smits, Circular Economy and Water Resources Management, and Emiel Elferink, Sustainable Soil Management

PROJECT DURATION:
2018 - 2021

PUBLIC FUNDING:
2,500,000 euros

PRIVATE FUNDING:
2,000,000 euros

PROJECT PARTNERS:

Province of Noord-Brabant (NL), The Rivers Trust (UK), Vlaamse Landmaatschappij (BE), European Landowners Organization (BE), Association des Chambres d'Agriculture de l'Arc Atlantique (FR), Philipps-Universität Marburg UMR (DE), Durham County Council (UK), Limerick Institute of Technology (IE), VHL





Biodiversity



Kenyan ungulates send poacher alerts

The issue

Wildlife crime is a growing problem that causes loss of biodiversity and disrupts social and economic relationships in local communities. Elephant and rhino poaching has increased significantly in recent years, threatening the very survival of these species.

The project

The four-year project aims to use modern techniques to add to our basic knowledge of animals in order to tackle a current international wildlife management problem. This involves using the senses of ungulates, such as impala and hartebeest, to warn about the presence of poachers. The challenge is to use biosensors to pick up the alarm signals and locations of these living networks of ungulates and to wirelessly transmit relevant information to park rangers so that they can take targeted action. For the first two years, the system was tested in the Netherlands at Safaripark Beekse Bergen, Oostvaardersplassen (Staatsbosbeheer) and Veluwezoom (Natuurmonumenten). It is now being rolled out and tested in Kenya over a two-year period.

Deliverables

The ultimate goal is to produce a working prototype of the sensor network in Tsavo National Park in Kenya, whereby the alarm signals and locations of ungulate herds can be measured, analysed and interpreted by park rangers.

PROFESSOR:

Hans Hopster, Animal Behaviour, Animal Health and Animal Welfare

PROJECT DURATION:

2018 - 2021

PUBLIC FUNDING:

700,000 euros (RAAK-Pro)

PRIVATE FUNDING:

314,000 euros

PROJECT PARTNERS:

SODAQ, Saxion University of Applied Sciences, VHL, Wageningen University & Research, World Wildlife Fund, Kenya Wildlife Services

This research is co-financed by the Taskforce for Applied Research SIA of the Dutch Research Council (NWO).



PROFESSOR:

Derk Jan Stobbelaar,
Sustainable Landscape
Management

PROJECT DURATION:

2015 - 2017

PUBLIC FUNDING::

50,000 euros (KCNL) and
25,000 euros (education)

PRIVATE FUNDING:

25,000 euros

(professional field)

PROJECT PARTNERS:

Natuurmonumenten,
VHL



'Working with communities' guide for nature managers

The issue

Citizens have become increasingly vocal in recent decades, demanding a role in issues such as nature management. The challenge facing society and nature organisations is to determine how and to what extent citizens and other stakeholders can be involved. Natuurmonumenten, the Dutch nature conservation organisation, works with 'communities' – groups of citizens and other stakeholders who work on nature management on their own initiative and with a high degree of autonomy. However, this new development raises questions: What are the ecological, social and financial implications of communities in the management of areas, compared with volunteer groups? How do you organise communities in a way that satisfies citizens and nature managers alike?

The project

The project sought to identify the number of existing Natuurmonumenten communities, their characteristics and how they function. First, a survey gave all Natuurmonumenten management units an opportunity to give their views on the number of communities and their characteristics, such as the number of participants, activities and degree of autonomy. The operation of six communities was then investigated further, looking at both the division of roles between Natuurmonumenten and citizens, as well as factors for success and failure. This involved in-depth interviews with forest rangers, coordinators and participants.

Deliverables

A 'working with communities' guide for nature managers, containing success factors, challenges and tips for forest rangers. The guide can be downloaded for free (see the QR code) and can be used by anyone in the nature conservation world and by those wishing to learn how to work with communities. Several reports and articles have also been published on the results of this research, which showed that most Natuurmonumenten communities have a positive environmental, social and financial impact and that they function well with a high degree of autonomy.



Mosaic management for meadow birds

The issue

To optimise meadow bird protection, there needs to be a mosaic of different biotopes present during the meadow bird season. Such a mosaic consists of a variety of herb-rich grasslands, inundated fields and ditches, and grasslands with rest periods. This provides sufficient protection for meadow bird nests and chicks, allowing chicks to become fledgelings. It also provides sufficient food for the adult birds and chicks. This mosaic of meadow bird biotopes is not yet optimal in many areas. Although Beheer op Maat (BoM), the online knowledge system of Wageningen University & Research (WUR), could help with this problem, it was little used.

The project

All field coordinators of the agricultural collectives involved in meadow bird management were introduced to the BoM knowledge system in two series of workshops. They learned how the system works, what information is used and how management is tested. They were then able to analyse their own area. Their experiences were collected, and everyone looked together at what improvements could be made to the system's usability, the used methodologies and the data analyses.

Deliverables

Area coordinators are enthusiastic about the use of the BoM online knowledge system. It has given them a better understanding of ways to improve mosaic management for meadow birds in a given area. It helps them to decide which management measures should be introduced where. It also helps them to better substantiate the modified agreements with farmers. WUR has taken up their recommendations for improvements to BoM and implemented them where possible. This has improved the online knowledge system and made it more user-friendly for area coordinators. Since 2018, WUR has allowed them to use BoM independently in their work for their agricultural collectives.



PROFESSOR:

Astrid Manhoudt,
Meadow Birds

PROJECT DURATION:

2017 - 2018

PUBLIC FUNDING:

108,094 euros

PROJECT PARTNERS:

30 agricultural collectives,
various employees of
(provincial) landscapes
and voluntary organisations,
Wageningen Environmental
Research, VHL



PROFESSOR:

Noël van Dooren,
Sustainable Foodscapes in
Urban Regions (applied
research group ended in
February 2020)

PROJECT DURATION:

2018 – 2019 (first phase)
2019 – 2020 (second phase)

PUBLIC FUNDING:

70,000 euros

PRIVATE FUNDING:

20,000 euros

PROJECT PARTNERS:

VHL, Helicon, six SMEs



Food forests, a credible new and sustainable food system?

Larenstein Circular Estate

The issue

Whether for reasons of climate, energy, soil or biodiversity, we need to make fundamental changes to our agricultural system. Food forests are presented as a strong alternative by various parties, but are not credible yet as there is no clear picture of for example the relationship between design and planting, harvesting and market.

The project

As a contribution to the regional and national debate on Food forests are presented as a strong alternative by various parties, but are not credible yet as there is no clear picture of for example the relationship between design been planted on the Larenstein estate and embedded within Van Hall Larenstein, with a canteen, consumers and management. A teaching and research programme was set up, entailing the development of a monitoring programme and research into specific spatial and experience aspects. A series of meetings for debate and knowledge exchange was also organised.

Deliverables

We have built a chain of projects, both small and large, on this theme. The forest garden will be a permanent facility at Van Hall Larenstein. Ideally, the project will transition seamlessly into new projects so that new layers or components will be added to the forest garden, the research and teaching programme can be developed, and the debate will be broadened. In other words, the forest garden will be part of a broad range of new agricultural strategies (agroforestry).



Harvesting public green spaces

The issue

A new food system requires a transformation of our agriculture, but it can also involve new areas and new players taking part in food production. Dutch cities and towns have a large reservoir of public green spaces whose ability to grow nuts and fruits has never been tested.

The project

Van Hall Larenstein joined forces with six municipalities to find ways to better exploit the existing harvesting possibilities of public green spaces, to multiply the harvest potential through new planting, and to investigate any potential conflicts through design.

Deliverables

In terms of the practical aspects, we learned about the motives, conditions and obstacles relating to harvesting possibilities in existing green spaces (such as orchards) and we produced guidelines for small new initiatives. In terms of the speculative aspects, we developed designs for public green spaces that can be remodelled to make a substantial contribution to the 'food basket' of cities and towns. The design studies clearly revealed potential tensions that municipalities should anticipate between different claims to public green space, and how they can be managed in collaboration with local inhabitants and management groups. The project also generated several articles for national and international publications, as well as conference contributions.



PROFESSOR:

Noël van Dooren,
Sustainable Foodscapes
in Urban Regions (applied
research group ended in
February 2020)

PROJECT DURATION:

2016 - 2019

PUBLIC FUNDING:

70,000 euros

PRIVATE FUNDING:

80,000 euros

PROJECT PARTNERS:

VHL, Stichting IJsselboom-
gaarden, Stadswerk,
Culemborg, Wageningen,
Leeuwarden, Arnhem,
Hoorn, Deventer





Making palm oil plantations in Malaysia and Indonesia more sustainable

The issue

There has been an ongoing discussion about palm oil and sustainability for a number of years now. On the one hand, palm oil cultivation provides unparalleled opportunities for the agro-food industry and local farmers in tropical countries. On the other hand, there is considerable protest from environmental and local groups because of land rights violations and the severe environmental impact.

The project

In this project, we are working with counterparts from Malaysia and Indonesia to improve the criteria and indicators for sustainable palm oil. This will allow palm oil consumers to establish with greater certainty whether palm oil has been grown sustainably.

Deliverables

The project has produced a series of background documents for the Round Table on Sustainable Palm Oil (RSPO). These can be downloaded from our website (www.sensorproject.net) and used by stakeholders in the palm oil industry, NGOs and government policymakers. We also advised the RSPO on drawing up improved guidelines for the certification of small palm oil farmers.

ASSOCIATE PROFESSOR:

Peter van der Meer,
Oil Palm and Tropical Forests

PROJECT DURATION:

2016 - 2020

PRIVATE FUNDING:

80,000 euros per year

PROJECT PARTNERS:

Wageningen University &
Research, Oxford University
UK, UNLAM Indonesia, UPM
Malaysia, VHL





Training teak plantation staff in Ghana

The issue

Ghana has lost much of its tropical forest in recent decades, causing deforested areas to become severely eroded. These areas have lost much of their biodiversity and generate no income for the local population.

The project

In this project, we provided training for middle management at a teak plantation in north-eastern Ghana. The training focused on improving knowledge and awareness in areas such as tree planting, combating forest fires, monitoring and plantation management. Some 60 people took part in the training in 2016, 2017 and 2019.

Deliverables

The project has provided better-trained personnel who are more aware of the important role they play in effectively managing the plantation and the surrounding area.

The planting of teak trees and the creation of green buffer zones has made the area more sustainable, which has led to increasing biodiversity and provided jobs for the local population. More than 1000 local workers are currently working at the plantation, and initiatives are also being undertaken in the surrounding area for further reforestation involving other fruit trees.

ASSOCIATE PROFESSOR:

Peter van der Meer, Oil Palm and Tropical Forests

PROJECT DURATION:

2016, 2017, 2019

PUBLIC FUNDING:

80,000 euros per year
(NUFFIC – TMT)

PROJECT PARTNERS:

Form International, CMO
South Africa, Form Ghana,
VHL



RESEARCHER:

Jeroen Huisman,
Fish Ecology

PROJECT DURATION:

2019 - 2023

TOTAL BUDGET**TOTAL PROJECTS:**

> 10,000,000 euros

PROJECT PARTNERS:

Sportvisserij Nederland,
Staatsbosbeheer,
Sportvisserij Groningen-
Drenthe and Sportvis-
serij Fryslân, VHL,
de Waddenvereniging,
Waterschap Noorder-
zijlvest, Province of
Groningen, Prolander
and many more

*The subsidised activity
was made possible
by many organizations,
including a grant from
the Waddenfonds.*



Fish ecological research in the Wadden Sea area

The issue

Fish stocks in coastal and estuarine areas around the world are under pressure from anthropogenic disturbances, habitat loss, migratory barriers and pollution. Diadromous fish stocks in the Wadden Sea are suffering from habitat loss and migratory barriers. The construction of dams, locks and pumping stations makes it difficult for migratory fish as for example sticklebacks and eel to reach the streams, lakes and canals. To make the Wadden Sea area more ecologically and economically robust, its fish populations have to increase once again. This may be achieved by reintroducing fish, for example sea trout, removing barriers along the migratory route and promoting the economic value of fish.

The project

The Ruim Baan voor Vissen, Sud Ie and Vissen voor Verbinding projects aim at improving fish stocks and habitat in the coastal zone of the Wadden Sea and its tributaries. The projects encompass measures to improve fish habitat, build fish passes and stimulate the recreational fishing economy. Van Hall Larenstein, together with many partners, is conducting fish ecological research aimed at evaluating the migratory routes of diadromous fish species and use of habitat in the brooks, canals, lakes and coastal zone of the Wadden Sea. One way to do this is to use modern transmitter technologies that allow us to track the migration of individual fish.

Deliverables

The project is making a significant contribution to improving the ecology of the Wadden Sea and its tributaries. Species like sticklebacks and sea trout are able to migrate from the Wadden Sea to the polders and streams that flow in to the Wadden sea and vice versa. The stream and polder habitats are improved by the construction of nature-friendly banks and spawning sites. Anglers will be able to fish for sea trout in the northern Netherlands and no longer have to drive to Denmark. Finally, we will work closely with a lot of volunteers and students.

Soil

PROFESSOR:

Emiel Elferink,
Sustainable Soil
Management

PROJECT DURATION:

2019 - 2020

PUBLIC FUNDING:

490,000 euros

PROJECT PARTNERS:

LTO-Noord, Cumela,
Aequator Groen &
Ruimte, VHL



Enlisting farmers and contract workers to tackle soil compaction in the northern Netherlands

The issue

Compaction of the subsoil is a problem within agriculture. Approximately 45% of the surface area of the Netherlands is compacted to a greater or lesser degree. An exploratory study conducted by Aequator Groen & Ruimte and Van Hall Larenstein in Groningen, Friesland and Drenthe in 2017 revealed figures that were even more disturbing.

The project

The project has focused on reaching agricultural entrepreneurs through contractors so that they can jointly tackle the problem of soil compaction. The aim is to initiate a process that heightens awareness of this problem and achieves more interaction between contract workers and farmers.

Deliverables

The project has entailed farmers and contract workers setting up various 'farmer experiments'. This gives participating entrepreneurs an understanding of and experience with practical feasibility, as well as an awareness of the impact of possible measures to counteract soil compaction. The farmer experiments serve as the basis for demonstration days for interested parties in the region. Winter meetings are also organised, which focus more on the dissemination of knowledge among contract workers. Along with a desk study, the farmer experiments have provided input for the drafting of a checklist to support collaboration between contract workers and farmers on the elimination and prevention of soil compaction. The checklist is used when the contract worker and farmer meet to discuss the crop plan and/or work.



Organic waste streams for healthy soil in the municipality of Ooststellingwerf

The issue

In a biobased economy, fossil fuels are replaced by natural renewable alternatives in order to tackle problems relating to climate and raw materials. Soils have to be in top condition if fossil raw materials are to be replaced by a green alternative. The biobased economy will increase the demand for green raw materials, which in turn places demands on the productive capacity of the soil.

The project

Van Hall Larenstein, together with the municipality of Ooststellingwerf, local farmers Anne Graafstra and Jan-Roelof Betten, and the Louis Bolk Institute, has launched a study to improve the condition of the soil in Ooststellingwerf through the use of local organic waste streams.

Deliverables

First, the project provided an overview of the main soil problems and available organic waste streams in the municipality of Ooststellingwerf. An investigation was then made, based on a desk study, into the best technique to convert these waste streams at the farm level into an organic soil improver. The relevant legislation and regulations were also explored. This resulted in an overview of composting methods, legislation and regulations and a composting guide for farmers. The environmental impacts and costs were then calculated for different processing scenarios. Composting local waste streams at the farm level emerged as the most sustainable and cost-effective option in these scenarios.

PROFESSOR:

Emiel Elferink, Sustainable Soil Management

PROJECT DURATION:

2018 - 2018

PUBLIC FUNDING:

60,000 euros

PROJECT PARTNERS:

Louis Bolk Institute, municipality of Ooststellingwerf, De Samenwerking, Graafstra, VHL





Innovation Centre

Innovation centre

In a collaboration with the business community and organisations, lecturers conduct research into product and process. This requires suitable facilities. Fully equipped research facilities have been set up for this purpose in which companies, research institutes, and the business community can conduct or outsource experiments. These are the Water Application Centre and the Food Application Centre for Technology in Leeuwarden.

Both centres provide opportunities for applied education and research in the domains of food and water. The intensive collaboration with the business community contributes to more and better educated young professionals. They facilitate research for the business community and stimulate the development of startups.

Food Application Centre for Technology (FACT)

The FACT is a food technology test location. It is an easily accessible meeting place where knowledge is generated and shared. New product and process concepts are developed in a close collaboration between SMEs, companies, and knowledge institutions.

The FACT can benefit the business community in the following ways:

- Meeting place for new staff
- Nearby, easily accessible knowledge and innovation
- Analysis and advice
- Access to modern processing equipment for pilots
- Network of potential collaboration partners

Water Application Centre (WAC)

The WAC can facilitate the business community by providing infrastructure and equipment for conducting water technology experiments. In addition to the infrastructure, the WAC provides technical support for building and maintaining test installations.

For laboratory work, the WAC has fully equipped chemical, microbiological, and molecular laboratories. In collaboration with laboratories in the area, the WAC can provide a complete analysis package in which all components of the research can be measured.





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