WAGENINGEN WORLD
MAGAZINE OF WAGENINGEN UNIVERSITY & RESEARCH ABOUT CONTRIBUTING TO THE QUALITY OF LIFE no.1 2023

The new construction materials are grown on the farm

Page 12: The builder's CO_2 footprint can be reduced

Vaccines against bird flu

Do they work against the H5N1 virus that causes outbreaks worldwide?

Plastic that repairs itself

Magic self-healing plastic can change shape to become reusable

Can't we make it look nicer?

'There are missed opportunities for combining solar parks with nature'

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WAGENINGEN UNIVERSITY & RESEARCH

The mission of Wageningen University & Research is "To explore the potential of nature to improve the quality of life". Under the banner Wageningen University & Research, Wageningen University and the specialised research institutes of the Wageningen Research Foundation have joined forces in contributing to finding solutions to important questions in the domain of healthy food and living environment. With its roughly 30 branches, 7,600 employees (6,700 fte) and 13,100 students and over 150,000 participants to WUR's Life Long Learning, Wageningen University & Research is one of the leading organisations in its domain. The unique Wageningen approach lies in its integrated approach to issues and the collaboration between different disciplines.

WAGENINGEN WORLD ONLINE
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FEATURES

PHOTO ERIC SCHOLTEN

Changing Wageningen World

'Thirteen years, 51 editions, 2652 pages. Sent to 154 countries and more than 50,000 readers. Wageningen World is a household name. A readable quarterly magazine offering our readers – alumni, associates and others who are interested – a selection of the best stories about the impact of Wageningen research.

'But this is set to change. Because it no longer feels quite right. While a growing number of our readers are reading the magazine online, more than 35,000 print copies are still being sent around the world four times a year. Wrapped in plastic. Sustainable plastic, but even so. Is it still okay for the world's greenest university to be doing that? Aren't the environmental costs of printing and transport beginning to overshadow our goal of keeping in touch with Wageningen alumni and with companies, research institutes and government bodies?

'Actually, deep down we already know the answer. It's not okay anymore. And let's be honest: there are financial considerations too. Postage costs, for example, have gone through the roof in recent years, as has the price of paper. Meanwhile, reading habits have changed and news and other articles are increasingly being read online.

'So where do we go from here? We don't know yet. We've got a few scenarios in mind. One thing is certain: we want to stay in touch and to keep you up to date with worldwide developments in the Wageningen fields of expertise. The question is, what form this should take.

'In order to make an informed decision, we would like to hear how you prefer to read news and other stories from Wageningen. Perhaps you get enough information about Wageningen through social media or other channels. Maybe you are only interested in news about your own subject area, or you'd like to read more about what people in your cohort are up to. You can read more about this on page 10, and you can fill in our questionnaire via a QR code or a link.

'For now: after this number there will be one more print edition. In the meantime, we'll be working on the results of the survey. Thanks in advance for your interest and for filling in the questionnaire. We'll keep you informed!'

Willem Andrée, Editor-in-chief, Resource and Wageningen World

ENVIRONMENT

Flea collars pollute bird nests

Dogs that are protected against fleas and ticks with flea collars, drops or tablets contaminate their environment. Tests show they introduce products such as imidacloprid and fipronil into the environment when swimming or peeing or from dog hairs shed during coat care. Those hairs can end up in bird nests, which could have consequences for newborn chicks. When dogs are washed at home or a grooming salon, the products can get into the sewers and water treatment plants.
This study was an initial exploratory analysis. The results were published in February in the journal *Science of the Total Environment*.
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PHOTO SHUTTERSTOCK

CLIMATE

Delta Climate Centre in Vlissingen

WUR is one of the six founders of the Delta Climate Centre (DCC) for water, food and energy. This institute will start operating mid-2023 in the Kenniswerf district of Vlissingen and will focus on education, research and industry for a sustainable, future-proof delta. WUR will be collaborating with science institutes from Zeeland, Utrecht University and the Netherlands Institute for Sea Research (NIOZ).
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EDUCATION

PHOTO MARTE HOFSTEENGE

First cohort of Engineering Doctorates

Wageningen has a new category of degree programme: the two-year Engineering Doctorate (EngD). The first ten technological designers started the programme in January.

'Like the PhD, the EngD is a programme you do after the Master's,' explains Femke Brouwer, the new programme's coordinator. 'In a PhD, you do fundamental research, whereas the EngD is about applying that fundamental knowledge to design something for use in practice.' The name of the programme – Design for Agrifood & Ecological Systems – shows this is a broad study that takes students from a range of fields. The design assignments come from practitioners, for example companies, public authorities, NGOs, educational organizations and research institutes that want a solution to practical problems.
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EDUCATION

Marine Sciences at Wageningen

As of next academic year, WUR will be offering the new English-language Bachelor's degree Marine Sciences. It is a broad programme in which students acquire ecological expertise but also learn about the sea as a source of food and its importance for society. Wageningen already has a Master's in Aquaculture and Marine Resource Management. But students felt little attention was paid to marine topics in the Bachelor's phase. The new degree fills that gap. 'Other Dutch universities don't have Bachelor's programmes specifically focused on the marine world either,' says programme director Jan Philipsen of WUR. 'Students will learn how to do research at sea. That means they will need to go snorkelling or diving occasionally, so we will probably be putting on diving courses.'
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PHOTO ACHMAD HUSEIN NYOMPA / SHUTTERSTOCK.COM

AGRICULTURE AND ENVIRONMENT

All regions can contribute to agriculture's environmental targets

PHOTO ANP

Dutch agriculture can largely achieve the environmental targets imposed on it if regions apply smart tailored solutions. That does have far-reaching consequences for farmers, though. These conclusions are from a scenario study commissioned by the Ministry of Agriculture and published at the start of the year.

The ministry asked WUR researchers what would need to be done regionally to achieve the national targets for water quality, nitrogen and greenhouse gas emissions. The findings can be used to suggest options for the provincial authorities, which are currently working on 'area-specific plans' for achieving the national environmental targets for agriculture.

The report emphasizes that there are large regional differences in types of farms, nature areas and the state of the soil. 'That means each area can help hit the nitrogen, water and climate targets in its own way,' says Edo Gies, a senior researcher in Dynamic Spatial Use at Wageningen Environmental Research. The peatlands in Zuid-Holland and Friesland for example can make a big contribution to the climate targets if the groundwater levels there are raised, which would mean less CO_2 being released through the oxidation of peat. In the Veluwe with its sandy soil, the main potential gains lie in reducing nitrogen emissions from livestock farming.

The total package of measures will not be enough to achieve the targets in full. For instance, it will not be possible to meet the phosphate norms because of the release of phosphate that has already accumulated in the soil over the years.

According to the researchers, livestock farming in the Netherlands needs to become less intensive. 'The measures we investigated require farmers to make far-reaching changes,' says Gies. 'That is why we need their help in arriving at a new, less harmful kind of agriculture.'

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WAGENINGEN ACADEMY

New Summer Schools in Wageningen

Summer Schools have been popular in Wageningen for years among both students and other professionals whose work relates to agriculture, nutrition, environmental issues or sustainability. We continue to expand our range of options, and have recently added two Summer Schools, bringing us to a total of eight courses. For pioneers who want to know all about farming on the moon, we offer a course on Food for Mars and Moon. And for those keen to equip themselves to make better decisions based on climate data, there is a new course called Climate Information for Adaptation. The courses are run during the northern summer months. Some take place on the Wageningen Campus and some can be taken online, some in English, some in Dutch.

More information: www.wur.eu/academy

NATURE AND ENVIRONMENT

PHOTO SHUTTERSTOCK

Neonicotinoids through gaps in the law

The European Academies' Science Advisory Council warns that phasing out the use of neonicotinoids – a group of insecticides – is being delayed because of gaps in the law. One of the report authors is the Wageningen researcher Cláudia de Lima e Silva.
The EU wants to restrict the use of neonicotinoids to a minimum, mainly to stop the continuing decline in insect populations. But some member states are getting round the rules, warns the Advisory Council. They issue emergency permits as a matter of course to allow the use of banned neonicotinoids, for example to combat flea beetles. The Council also finds it worrying that alternative products under development have a similar effect on insects.
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DATA MANAGEMENT

One website for data on agriculture, nature and food

Anyone looking for facts on agriculture, nature and food now only has to consult one website: the portal 'De Staat van Landbouw, Natuur en Voedsel'.

This site, developed by Wageningen Economic Research for the Ministry of Agriculture, gives access to key figures on topics such as nitrogen, trade and field birds, and makes the information understandable not just for scientists but also for politicians or policymakers, for example.
The data is taken from many different sources and combined, harmonized and validated by the Wageningen University & Research data warehouse. Users can select the relevant datasets and graphs with just a few clicks. The site also refers the user to other places with reliable information. That can save people a lot of time, expects Mark Dolman, the data management product owner. 'Researchers spend about 60 per cent of their time on average collecting data. Before you can interpret it, you first need to harmonize, validate, purge and combine it. These steps have already been taken here.'
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PHOTO ANP

BIOTECHNOLOGY

Dendroids as internal medicine courier

Rebecca Kaup has developed dendroids, clusters of polymers that can transport medicines or genetic material in the body.

Kaup constructed the new molecules for her PhD research in the BioNanoTechnology chair group. She did this using dendrimers, densely branched polymers with cavities. They are currently attracting a lot of interest in medical fields. The cavities can be used to transport medicines within the body. But each dendrimer can only take a small payload.

The PhD candidate developed a way to link dendrimers, turning them into super-couriers, dubbed dendroids. To construct them, she created a kind of mould that positions the dendrimers in the right place before linking them. Kaup: 'You can also link dendrimers in a solution, but then you don't have much control over the result.

For medical applications, it's important to have a well-defined final product and to be able to reproduce the same result.'
Work is also being done with Wageningen plant scientists on another application: delivering genetic material to specific places in plant cells.
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AQUATIC ECOLOGY

PHOTO VIDIPHOTO

Manatee with camera records grazing behaviour

To better understand the West Indian manatee, a PhD candidate is fitting the animals with underwater cameras. The study aims to see how the manatee, an endangered species, uses its habitat in the wild.

'We hope to get comprehensive data for the first time on the West Indian manatee and its grazing behaviour,' explains Fee Smulders, a PhD candidate at Aquatic Ecology and Water Quality Management. For instance, how do they move around during the day and what seagrass do they prefer to eat? 'They will be mapping the seagrass area and we may discover new fields of seagrass.'

As a test, two manatees in Burgers' Zoo were fitted with underwater cameras with suction cups. 'The controlled environment of the zoo lets us test how to get the best images and check the animals aren't adversely affected by the camera,' explains Smulders. 'After discussing it with local experts in Mexico, we decided to attach the underwater cameras in the wild while the manatees are resting, at depths of about two metres. We can do that while snorkelling. We hope to start on this in July.'

PHOTO VIDIPHOTO

In Burgers' Zoo, the manatees swim in fresh water. The expectation is that in seawater, the camera will become detached after just one day and float to the surface. The researchers will be able to pick up the 10,000-euro camera with the aid of its GPS, a radio signal and its bright pink colour, fish it out of the waves and read off the data before using it again.

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PROTEIN TRANSITION

Eat twice as much plant-based protein

Having farmers grow pulses rich in protein on a large scale and getting consumers to double the amount of plant-based protein they eat is feasible within six years. This conclusion was reached by the Ministry of Agriculture, Nature and Food Quality, WUR and various other partners in the plan for an Economically-Powered Protein Transition through Innovation in Chains (EPPIC). The consultancy Deloitte calculated that if implemented, the plan would generate 2.6 billion euros in economic activity. The plan has been submitted for financial support worth 96 million euros from the National Growth Fund. Anyone interested in learning more about the protein transition can read the book *Our Future Proteins*, which came out in March. It contains diverse views on the future production and consumption of sustainable proteins. The lead editor was Stacy Pyett, the Proteins for Life programme manager at WUR. The book is available free of charge in print form or as an e-book.

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PHOTO SHUTTERSTOCK

NATURE

WUR joins green alliance

WUR has become a founder member of the Nature Positive Universities Alliance, which was launched in Montreal in December during the UN biodiversity summit (COP15). Membership implies that the institution will prevent or repair the damage to nature resulting from its activities and operations.

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LIVING ENVIRONMENT

Healthier with a green garden

Gardens with a lot of greenery seem to have a big influence on the health and welfare of the residents. That is one of the conclusions of a study by Wageningen Environmental Research and the Netherlands Institute for Health Services Research (NIVEL). The research team studied the association between having your own garden and suffering various conditions. They found that a stroke or brain haemorrhage was 15 per cent less frequent among people with gardens. Having a lot of greenery in the garden had an additional effect on health. 'The strength of the relationships we found is striking,' says project leader Sjerp de Vries.
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PHOTO SHUTTERSTOCK

EARTH SCIENCES

PHOTO SHUTTERSTOCK

Tipping climate led to substantial warming

In the past, the Earth has experienced lengthy hot periods after climate tipping points were exceeded. This finding comes from research by Earth scientists and mathematicians from Utrecht and Wageningen.

The study, which was published in *Science Advances* in April, shows for the first time that tipping points can be exceeded. Some scientists doubt whether this is possible; they assume the climate system is too stable. The new publication describes three periods – tens of millions of years ago – when exceeding climate tipping points led to a chain reaction that released extra amounts of greenhouse gases. The result was an increase in temperatures worldwide of five degrees on average. After the tipping point has been passed, a new stable condition is reached that is irreversible for a long period. 'So long that you can see it as a permanent change from a human perspective,' says Shruti Setty, a mathematician in the Aquatic Ecology and Water Quality Management group.
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BIODIVERSITY AND LANDSCAPE

Crowdfunding for Limburg nature

University Fund Wageningen has joined forces with scientists to start a crowdfunding campaign to restore nature in South Limburg.

The money will be used for projects carried out by the Plant Ecology and Nature Conservation chair group. They want to restore wildlife corridors linking nature areas in the Geul Valley in South Limburg. They will work with relevant regional parties. Four years ago, the ecologists talked to farmers' organizations, municipalities, nature conservation organizations, the water board, the water supply company and the provincial authority to see how the landscape could be developed and managed differently, for example by mowing the verges at different times using different methods. That was a success: wild bee populations increased and the shrill carder bumblebee returned. More money is needed for the follow-up. 'It's difficult to get grants for nature outside the Natura2000 areas, whereas we think that's precisely where the big gains can be made,' says Professor David Kleijn. 'The money from this campaign will let us restore landscape elements and thereby improve biodiversity. We can turn fragmented nature back into one large nature area.'
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PHOTO SHUTTERSTOCK

METABOLISM

Healthier with personalized diet

A personalized diet that takes account of someone's metabolism will improve their health. This conclusion follows research by Maastricht UMC+, Wageningen University & Research and Radboud UMC, with financial support from the food industry.

PHOTO SHUTTERSTOCK

Nutrition researchers had long suspected that the optimum diet could vary between people depending on their metabolism, explains Lydia Afman, associate professor in the Human Nutrition & Health chair group. 'Now we have scientific proof of this.'

The researchers set up a study that followed 242 overweight participants during a three-month nutritional programme. The subjects were divided into two groups based on how well insulin did its job in the liver and muscles. If insulin does not do its job well enough, the cells in the body are less able to keep the blood sugar levels under control, which can eventually lead to type 2 diabetes and cardiovascular diseases. People who are less sensitive to the effect of insulin in their muscles turned out to benefit most from food with a lot of protein (for example, dairy products and nuts) and dietary fibre (wholemeal products and vegetables) and little fat. The participants whose insulin did not work so well in their livers benefited more from a diet with a lot of monounsaturated fatty acids, as found in olive oil and nuts. 'We expect people are more likely to stick to personal dietary advice than general guidelines, and this is a first step towards that,' says Afman. 'Even if someone already keeps to the guidelines for a healthy diet, improvements are still possible.'

The results were published in January in the scientific journal *Cell Metabolism*.

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ANIMAL HEALTH

Cow's face indicates disease

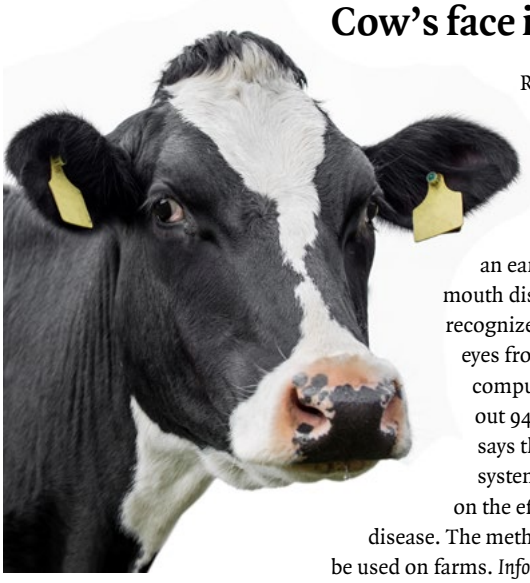

PHOTO SHUTTERSTOCK

Researcher Ronald Petie of Wageningen Bioveterinary Research (WBR) and students at the HAS and Avans universities of applied science in Den Bosch have developed an early warning system for foot and mouth disease. They trained a computer to recognize symptoms such as tears in the eyes from a photo of a cow's face. The computer was eventually able to pick out 94 per cent of the sick cows. Petie says that is enough for an early warning system in the trials WBR is conducting on the effectiveness of vaccines for the disease. The method is not yet at a stage where it can be used on farms. *Info: ronald.petie@wur.nl*

LANDSCAPE

NWO supports delta research

To be able to predict how deltas will develop, more knowledge is needed about how organisms, currents, waves, water and sand shape the landscape. That will be investigated in the Delta-ENIGMA project, which WUR is involved in. The funding – 16 million euros for ten years – comes from the Large-scale Scientific Infrastructure programme of the Dutch Research Council (NWO). Deltas have appeal as locations for human settlement in that they are fertile, flat and accessible by sea, but they are also vulnerable to climate change and rising sea levels.

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Wageningen Alumniblad

Resource &
Wageningen Update

THE ALUMNI AND ASSOCIATES' MAGAZINE WAGENINGEN WORLD

Not the end of the world

After 12 years, WUR is saying goodbye to *Wageningen World* in its current form. The way media are used has changed drastically, and that calls for a rethink of this particular communication channel. The editors have been reviewing the history of the quarterly magazine. That brought back lots of memories, and left us with a question about the future: what do WUR alumni and associates want?

SURVEY

Via the QR code or the link below, you can fill in a questionnaire to help WUR find out how you would like to receive Wageningen stories, news and other information.

https://exploratio.nl/intake/aa/wur

Up until 2001, the university published *WAB*, the Wageningen Alumni magazine: this came out four times a year, in newspaper format and in Dutch only. Its objective was to keep Wageningen alumni informed about 'Wageningen news' about science, the job market and institutional developments, which was combined with interviews with alumni.

About half the readers of WAB also read LT Journaal, an agricultural magazine for members of the alumni association KLV, the Royal Agricultural Society. This association was founded in 1886 to promote interaction and knowledge exchange between alumni and the National Agricultural College in Wageningen. In view of the overlap between the two publications in terms of readers and objectives, they were merged in 2001 to form a joint journal: *Wageningen Update*.

COFFEE TABLE MAGAZINE

Meanwhile, in 1998 the university had merged with the DLO institutes to become Wageningen UR. This led to the wish to keep business associates informed too about Wageningen knowledge and developments in Wageningen's fields of expertise.

'Wageningen UR is firmly embedded in society and wants to share its knowledge,' wrote Board Chairman Cees Veerman in 2001 in the foreword to the first issue of *Resource, Magazine of Wageningen University and Research Centre*. A substantial 'coffee table magazine'-large format, high quality photography, but not a glossye.

Just a few years later, it was decided that the target groups of *Wageningen Update* and *Resource* – alumni and business associates, with considerable overlap between the two – could easily be kept up to date through the same publication. So in 2005, a new version of *Wageningen Update* saw the light of day. This was a magazine in a compact format, and was now also published in English for the first time. There were four versions of this magazine, with adapted content for the various target groups – Dutch alumni and associates, and foreign alumni and associates.

FIFTY THOUSAND

A thorough restyling followed in 2010, with the creation of *Wageningen World*, the magazine we know today. It was tasked with keeping all Wageningen associates up to date, including alumni, both in the Netherlands and abroad, and thereby strengthening their links with WUR. In 2013, a digital option was added in the form of a browsable PDF. Today, Wageningen World's readership has grown to over 50,000 readers around the world. About 35,000 of them get the print version through the post every quarter, while about 15,000 subscribers receive the newsletter with a link to the digital pdf.

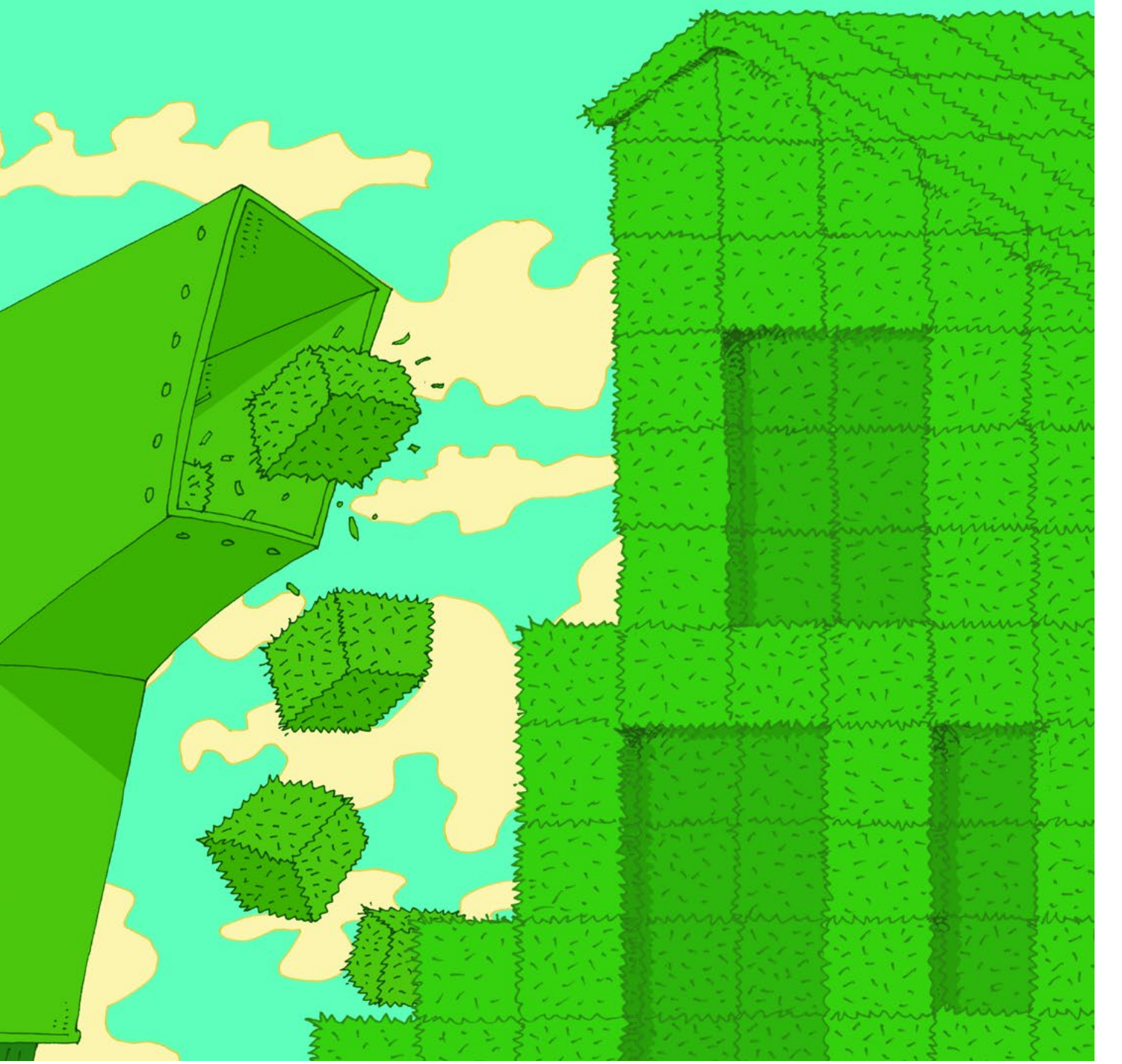
CHANGES

Meanwhile, media use has changed dramatically over the past 13 years; websites, digital newsletters, social media, films and podcasts have been given a greater role in the way news, information and stories are disseminated and read. The communication by Wageningen University & Research is no exception: it now has an informative website and social media outlets with a big following. Numerous e-newsletters also go out to associates and alumni, which contain scientific updates or news about activities for alumni. All this begs the question: given the environmental costs, can WUR still justify sending a print magazine around the world? And above all: what do WUR's associates and alumni feel they need? ■

The latest building materials come from the farm

The construction industry is responsible for massive CO_2 emissions. Switching to biobased materials, such as insulating fibres made of elephant grass, can reduce its climate footprint substantially. And there are more opportunities for biobased construction on the horizon. In Wageningen, for instance, old cement is being made reusable with waste products from the food industry.

TEXT RENÉ DIDDE **ILLUSTRATION** RHONALD BLOMMESTIJN



NATIONAL ENVIRONMENTAL DATABASE

One of the projects with which WUR is stimulating the market development of biobased building materials is aimed at including these materials in the National Environmental Database. 'We are collaborating on "product cards" which make the environmental benefits of 13 biobased materials clear to the construction industry. Architects and project developers can draw on this database to calculate the environmental score of their building,' says Martien van den Oever of Wageningen Food & Biobased Research. Work is also under way on a method of visualizing carbon storage in biobased building materials. This will help reduce the carbon footprint of buildings, hence increasing the use of bio-based building materials.

'Elephant grass is a fabulous crop with loads of applications,' says horticulturalist Joost Sterke from Haaren, Noord-Brabant. He has been growing this spectacular giant grass – which grows up to four metres in height – for seven years now. 'Miscanthus is suitable for use as fuel and as a substitute for peat in potting soil, and I sprinkle it in shredded form over my pots of seedlings. It stops weeds and moss from forming, and does it better than imported wood bark chips.'

Sterke notes an increase in interest in this fast-growing crop. 'I see it among horticulturalists who, like me, are looking for sustainable innovations, as well as among arable farmers on low-lying farms. Elephant grass copes well with wet conditions.' Sterke expects interest in growing the crop to increase further because the construction industry is sitting up and taking notice. 'A Belgian company visited us recently to explore the potential for a subfloor made of elephant grass for use in housing construction.'

In Wageningen, too, elephant grass is seen as a promising source of building materials. Wageningen Food & Biobased Research has been testing fibre-rich crops and waste streams for 30 years. For example, Richard Gosselink developed a rock-hard composite material for sheets shaped like the corrugated iron sheets that were used in the past for roofing barns. 'This is made from coconut husk, without adding any synthetic glue,' Gosselink explains, 'but now we can also produce this material from wood chips and elephant grass.'

INSULATING WITH GRASS

And this is just for starters, the experts think. They foresee a boom in interest in growing miscanthus once homes are no longer being insulated with the familiar yellow rockwool mats, but with fibres made out of elephant grass. 'I am looking forward to the day when houses are grown in the fields,' commented Minister of Housing and Spatial Planning Hugo de Jonge in the Dutch construction sector magazine Cobouw at the end of March. Last December, the government told parliament in a memo that it intends to actively promote fibre crops for bio-based construction. In anticipation of this, three ministries and six of the Dutch provinces are funding the Building Balance programme, which aims at speeding up the adoption of bio-based materials in the building sector. WUR is involved in this programme too.

The initiator and head of the programme, Jan Willem van de Groep, regularly gets around the kitchen table with farmers, as well as visiting construction companies. They stand to benefit a lot from each other, argues Van de Groep, a freelance consultant. 'New crops give arable and livestock farmers an additional business model. And the construction industry can reduce its negative impact on the climate. At present, the manufacture of rockwool and glass wool consumes a lot of energy and emits a lot of CO_2 and nitrogen.'

European agricultural regulations are favourable for the cultivation of elephant grass. From this spring, it is compulsory to maintain a three- to five-metre-wide buffer strip

‘It helps if the agriculture and construction sectors get linked up quickly’

along watercourses, where manure and pesticides are taboo. This applies to both arable fields and grassland. Extensive crops that require little in the way of inputs and pesticides are especially useful for these buffer strips, as well as for stream valleys and marginal land. Crops like bulrushes and elephant grass thrive in swampy areas, making it possible for peat meadows and water retention zones to remain productive. And then there are other fibre crops such as sunflower and hemp that are drought-resistant and suited to dry sandy soils, says Van de Groep.
A further advantage of these crops is that the production chain is often short, he adds. ‘The farmer delivers the harvest dried and shredded to sheds in the region, where it is sieved and dusted. Then the loose fibres can be processed for blow-in insulation in roofs and prefabricated building components. If there’s a well-run production chain and a system of compensation for carbon capture, a miscanthus farmer can make 3000 euros per hectare. We are working hard to get these kinds of chains up and running.’

STORING CARBON

Farmers in such production chains would also be paid for the carbon stored in their crops. ‘CO_2 storage is crucial if the Netherlands is to meet the Paris targets. The construction industry contributes to this with biofibres and wood, and most of the credits from that ought to go to the farmer.’
In the short term, the Building Balance programme aims at 13 regions, each with 1000 new hectares of fibre cultivation. The idea is for that to go up to 50,000 hectares by 2030. It has been calculated that with 180,000 hectares of fibre crops, the construction industry could entirely replace mineral fibre with biofibre. ‘That is about 10 percent of Dutch agricultural land, so it would contribute to a reduction in CO_2 of 5.5 megatons annually,’ says Van de Groep. The Netherlands needs to reduce its CO_2 emissions by 110 megatons of CO_2 by 2030 compared to 1990. Of that amount, 22 megatons will require additional measures, showed an official report in mid-April. Fibre farming could provide a fair proportion of that.

SECOND-HAND CEMENT

And there are plenty more opportunities for biobased construction on the horizon. A spectacular invention from Wageningen Food & Biobased Research’s lab is the reactivation of old cement. Cement is the main ingredient in concrete, and it accounts for seven per cent of global CO_2 emissions. Wageningen researchers have succeeded in making old cement reusable by adding certain biopolymers from waste products from the food industry to it. Which biopolymers these are, researcher Richard Gosselink declines to say. ‘Anyway, we have shown that this bio-additive can enable old cement to form new compounds. And then the cement sticks again, having been reactivated, as it were.’
This second-hand cement would be a major application in the valorization of waste products from the construction and food industries, and would cut CO_2 emissions at the same time. Wageningen Food & Biobased Research is collaborating on this with AMS Institute, TNO and several companies. ‘But the separation technology for construction and demolition waste needs some further fine-tuning, so that we can separate the cement from the bricks,’ says Gosselink. ‘We hope to make a paving stone as a demonstration product in 2024.’
Gosselink also shows us a block of ‘bio-asphalt’. He has been working for 10 years on how to replace the fossil product bitumen, which sticks together the stones and sand in asphalt, with lignin, the woody substance which gives plants their strength. ‘We have >

RICHARD GOSSELINK
Senior Biorefinery scientist, Wageningen Food & Biobased Research

MARTIEN VAN DEN OEVER
Scientist in Biorefinery and Biobased Products, Wageningen Food & Biobased Research

‘Biobased building products must be of impeccable quality’

ARJEN VAN KAMPEN
Business Development Manager, Biobased Products, Wageningen Food & Biobased Research

EDWIN HAMOEN
Programme Manager, Nature Based Materials, Wageningen Food & Biobased Research

started more than 30 pilot projects in the Netherlands, from a cycle path here on the Wageningen campus to a ring road in Terneuzen. At all those locations, half of the fossil bitumen has been replaced by lignin,’ says Gosselink.
Bitumen is left over after lighter and commercially attractive components such as paraffin, petrol, diesel and fuel oil have been extracted from oil. Lignin, on the other hand, is a renewable resource. Wood and pruning waste is full of it and it is produced by the paper industry, for example. Elephant grass is another potential source of lignin. Gosselink tells us of the interest being shown from abroad. Densely forested countries in Scandinavia, Canada and the Baltic states are particularly interested. ‘I expect that within a year we will be able to set up a test site where all the bitumen has been replaced by bio-based components.’
This research also brings lignin-based roofing closer to being a reality. The natural wood tissue can also replace the glue component phenol formaldehyde in things like chipboard or the widely used cladding panels known by the brand name Trespa. ‘We are investigating the feasibility of replacing all the conventional glue in such products with lignin and other bio-based components,’ says Gosselink.

PRESSING PLATES

Gosselink’s colleague Arjen van Kampen reaches into a large cardboard box and produces more intriguing new plant-based building materials discovered and developed in Wageningen. Such as insulation material made from hemp and 3-D printed material made from fibres from Japanese knotweed mixed with biobased plastic. And ‘binderless board’ –boards made from long fibres pressed into sheets using only high pressure and temperatures, without adding the traditionally fossil-based and non-recyclable binders. ‘The nice thing is that our research group started doing this around the year 2000 to process coconut waste in the Philippines, and now we are doing it here in the Netherlands using various local woody waste streams, such as reeds, straw and pruning waste. It is a good substitute for MDF board,’ says Van Kampen. ‘The great thing is, too, that this fibreboard withstands moisture well.’
Wageningen is also working on biorefinery to obtain better quality fibres, lignin and other components. ‘That often requires more sophisticated technology, but we try to keep the biorefinery processes simple so that they can be applied on a small scale in factories that provide added economic value regionally, and are located close to farms,’ Van Kampen explains.

REALIZING POTENTIAL

Researchers in Wageningen – about 150 of them by now – have been working on biobased materials for 30 years. A lot of new technology has become available in that period. So why is the application of the innovations still only limited? What would it take to realize the potential that exists? ‘Get started with the simplest applications, such as fibres,’ says Van de Groep. ‘It helps if agriculture and construction get linked up quickly and if politicians and the government see the benefits. After all, they are at the helm when it comes to creating stimulating conditions through legislation and incentive programmes.’ He points out that farmers would need to be able to supply bio-based building materials all year round, not just at harvest time.
For farmers, yield is an important issue. We need to take a broader view of new revenue models for fibre crops, Van Kampen argues. ‘For agricultural crops, of course,

profits are based on yields per hectare minus costs per hectare. If the proportion of food per hectare has to be reduced, perhaps by having fewer cows or wider crop-free zones beside ditches, then the farmer's business model needs to be supplemented – with profits from biofibres, for example. And the ecosystem services provided by these crops, such as the positive impact on soil and water quality, biodiversity and CO_2 storage in building materials, should be counted too.'

IMPECCABLE QUALITY

Edwin Hamoen has been leading the Wageningen Nature Based Materials research programme which Gosselink and Van Kampen are involved in for three years. Besides a steady supply from the farm, all the technical specifications that apply in the construction industry are important too, says Hamoen. 'The new bio-based building products must be of impeccable quality, provide good insulation and be fireproof and dampproof.' But he raises another issue as well. 'We as a society, and therefore also as Wageningen researchers, need to take a more integral view of the issues surrounding the energy transition, a more circular economy, manure, nitrogen, water and nature. The positive impact of the use of biobased materials should be reflected more in the price so as to ensure a fair comparison with conventional materials.'

The problem is that in the construction industry, as in agriculture, it is hard to leave the beaten track and break new ground, Hamoen believes. 'We are wary of what we don't know. For example, some builders think that natural insulation material attracts mice and other vermin. The construction world will not change course until all the materials have proven themselves twice over. Rightly so, of course, because quality and safety must come first. But it does create a chicken-and-egg situation, which will be over sooner if the government sets requirements for tenders to stipulate the use of bio-based materials.'

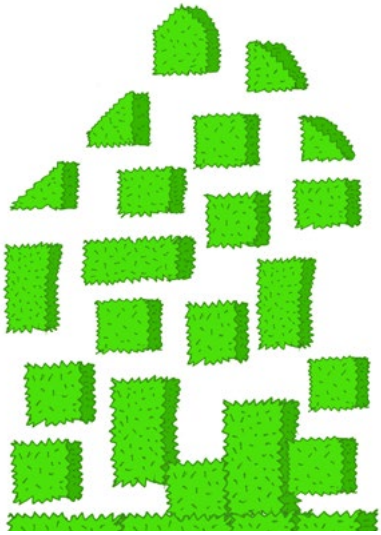
START NOW

Onno Dwars, director of Development at the major construction company Ballast Nedam, indicates that there is no time to lose if the construction and renovation work facing the Netherlands is to be done with more bio-based materials. 'Suppose this operation starts in 2030. Then the plans have to be ready in 2026, so you've got three years to get the bio-based chain up and running,' Dwars explains. That means as many building materials supply chains as possible need to become biobased, he says. 'Including insulation fibres, lignin in roofing bitumen and bio Trespa board. As well as laminated timber load-bearing beams and more timber-frame construction for ground-level housing. Don't choose some options, just do it all.'

If the government set a target that construction should reduce its CO_2 and nitrogen emissions to zero by 2035, the financiers would go into action, thinks Dwars. That would be an engine for change. 'The same thing happened with the energy transition in the construction industry. That was prompted by mortgage discounts and more generous mortgages for energy-efficient homes. And residents now have lower energy bills too.' Government and financiers could stimulate bio-based construction in a similar fashion, thinks Dwars.

'It would be great for WUR,' he says, 'if it could involve more parties in the agricultural chain in biobased construction and develop more new business models. Besides the construction sector, the packaging industry and clothing brands are also lining up to use plant-based raw materials.' ■

www.wur.eu/naturebasedmaterials



REGIONAL CHAINS

In the Regional Supply of Herbaceous Biomass project, Martien van den Oever of Wageningen Food & Biobased Research is doing a strengths and weaknesses analysis of biobased materials as an alternative to fossil-based materials. The study was commissioned by the Dutch ministry of Agriculture, Nature and Food Quality. 'With biobased raw materials like elephant grass, flax, hemp and straw, obviously you avoid using fossil resources, but you should also factor in things like the transport of large harvesters to numerous small plots of elephant grass,' he says to illustrate the pros and cons.

The aim of the study is to describe the 'value chains' – the chains of production and distribution from the raw material in the field to its application in an end-product. The study also analyses what it takes to create regional supply chains for biomass, and thereby to arrive at a clear national strategy. 'That is about demand, but also the location and scale of the farming and processing of the crop,' says Van den Oever. Construction materials and clothing come out as promising uses of biobased products. The research report will be published in summer 2023.

Bird flu vaccines are put to the test

Until recently, vaccination against bird flu was not permitted in Europe, but with new EU rules and favourable research results, vaccinating poultry is now becoming a serious option. Wageningen Bioveterinary Research is studying how effectively bird flu vaccines protect chickens.

TEXT ARNO VAN 'T HOOG **PHOTO** MAARTEN SPOEK **INFOGRAPHIC** STEFFIE PADMOS

The animal ambulances in the Netherlands can barely keep up with the reports they are getting of sick birds and carcasses that need removing. This spring, a particularly large number of black-headed gulls are being found dead; last year, the bird flu virus decimated entire breeding colonies of great terns. Both black-headed gulls and terns live in colonies and build their nests close together, which enables the virus to spread at lightning speed. Infection spells the end for many wild birds, as neurological damage eventually leads to death.

The avian flu virus is conquering the world. For a long time, South America was spared, but even there, the highly pathogenic H5N1 virus has killed thousands of birds and even sea lions in the past six months. The virus can spread quite easily between different bird species as well as to other animal groups. In Europe, otters, foxes and seals have already died of the virus. For this reason, gloves and protective clothing are worn for handling and disposing of dead birds.

OUTDOOR BAN

Many bird species found in the Netherlands such as geese, ducks and terns hibernate or breed elsewhere and can pick up an infection there or during migration. That means the virus can reach the country during the autumn migration and then infect poultry. For this reason, it is compulsory to keep poultry indoors and to shield birds in locations such as zoos. An outbreak of bird flu among poultry automatically means a cull by the Dutch Food and Consumer Product Safety Authority (NVWA). Between October 2022 and April 2023, hundreds of thousands of chickens, turkeys and ducks were culled on more than 20 farms. In 2022, the losses due to culling came to about 44 million euros.

In view of the impossibility of preventing all infections by keeping poultry indoors, and continued presence of the virus among wild birds, there has been a growing interest in recent years in the option of vaccinating poultry against bird flu. With a new generation of vaccines, it is now possible to distinguish between vaccinated birds and those infected with bird flu using a laboratory test. This procedure (known as 'DIVA' – Differentiating Infected from Vaccinated Animals) is a key prerequisite for controls in international trade. So the new vaccines remove a major objection to vaccination.

Veterinarian and veterinary microbiologist Evelien Germeraad of Wageningen Bioveterinary Research in Lelystad recently >

‘You need to be able to distinguish vaccinated chickens from chickens with bird flu’

conducted research on four bird flu vaccines. She talks here about the vaccination options.

Why is there no vaccination against bird flu in the Netherlands yet?

Throughout Europe, Avian flu is now present year-round in the wild bird population, posing a continuous threat to poultry farmers. They now have to keep their flocks indoors as no other measures against the virus are available yet. Until recently, vaccination against bird flu was not allowed in the EU. In March 2023, European legislation was amended so that vaccination is now allowed if certain conditions are met, such as the use of DIVA vaccines.’

What do these rules mean for poultry farmers who would like to vaccinate in future?

‘The crucial thing is surveillance: you must continue to closely monitor the farm where vaccination has been carried out. The reason for this is that you don’t want the bird flu virus to spread undetected. Because after vaccinating a flock, there is a risk that you won’t see any signs of disease even though the animals are actually undergoing a mild infection. Without vaccination, you notice straightaway if chickens are infected with bird flu, alerted by their symptoms, reduced feed consumption and deaths. As soon as a farmer sees these things, he must report it to the NVWA and they start testing.’

So vaccination cannot completely block the bird flu virus?

‘You can achieve two things by vaccinating against bird flu. Firstly, you inhibit the spread of the virus. Since the Covid-19 pandemic, everyone knows that it helps if vaccination reduces the number of virus particles you spread and therefore your risk of infecting others. Secondly, by vaccinating them, you can ensure that animals that get infected won’t fall ill or die. But that advantage also makes you less likely to notice virus infections. So you have to keep on checking whether the virus is circulating: a vet should visit regularly and animals that die should be checked for the virus.’

You tested several bird flu vaccines recently. What did you want to find out?

‘We selected four vaccines that are at an advanced stage of development, or have already been registered. And some are already in use outside Europe. The aim of our experiment was to see whether they are effective against the H5N1 virus that has been causing outbreaks in recent years, as we didn’t know that yet. And for most vaccines, not enough research had been done on how they affect the spread of the virus, i.e. the effect on virus transmission between vaccinated birds in the same coop.’

How do you find out which vaccines work best?

‘We drew up a number of requirements beforehand. The main requirement is that after vaccination, the reproduction number, the R value, should be below 1, which is a measure of the inhibition of the spread of the virus. Without vaccination, the reproduction number for bird flu in our experiment was higher than 1. As well as that, you want vaccination to provide protection against symptoms and to reduce or prevent mortality in animals that pick up an infection. Also, you need to be able to distinguish vaccinated chickens from unvaccinated chickens with avian flu using a test. If a vaccine meets all these criteria, we pronounce it effective.’

How does this kind of vaccine experiment work?

‘In our trials, five vaccinated chickens were infected with the H5N1 bird flu virus, and were then placed in a coop with five more vaccinated chickens. In the subsequent weeks, we monitored the number of virus particles in the chicken’s throat and cloaca. With that data, you can track the development and spread of the virus, and calculate the R value. The two HVT-H5 vaccines turned out to work the most efficiently, with an estimated R value of under 1. None of the animals that had those vaccines developed symptoms after they were infected.’

How are these types of vaccines administered?

‘Vaccinating against bird flu can be done both in the egg and just after hatching. The least labour-intensive method is to inject the vaccine into a fertilized egg, and that is how it is currently done. There are vaccinations against other viruses and bacteria too. Vaccination against the virus causing Newcastle Disease, for example, is compulsory. The poultry sector already has a lot of the knowledge and infrastructure it needs for vaccination.’

Do these avian flu vaccines also work in turkeys and ducks?

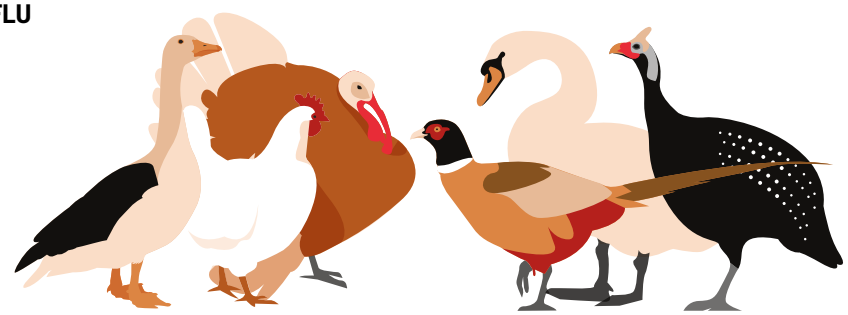
‘That will have to be studied separately. More than 90 per cent of Dutch poultry birds are laying hens and broilers. Other European countries have much larger turkey or duck sectors, so they do research on those birds. Later on, the results of the studies on other poultry species and breeds will be of use here too.’

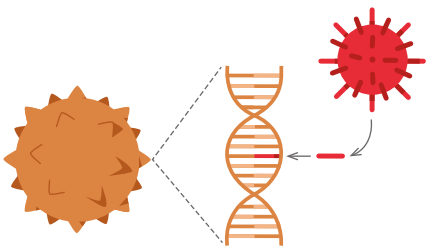
How long does an avian flu vaccine provide protection; will boosters be needed?

‘That is one of the things we want to look at in a follow-up study. That trial will run for longer, to see if the protection lasts beyond eight weeks. Broilers only live for six to eight weeks, but layers live much longer. There are some indications that these avian flu vaccines provide longer-term protection too, because they not only generate antibodies but also stimulate the T-cells of the immune

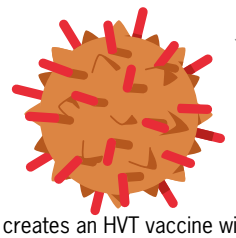
HVT-H5 VACCINES AGAINST BIRD FLU

The two vaccines that came out as effective in the Wageningen study are what are termed HVT-H5 vaccines. HVT stands for *Herpes Virus of Turkeys*. This virus can replicate in other poultry without causing disease symptoms.

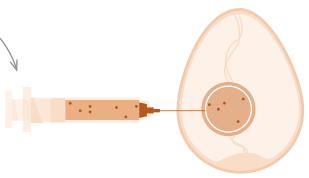




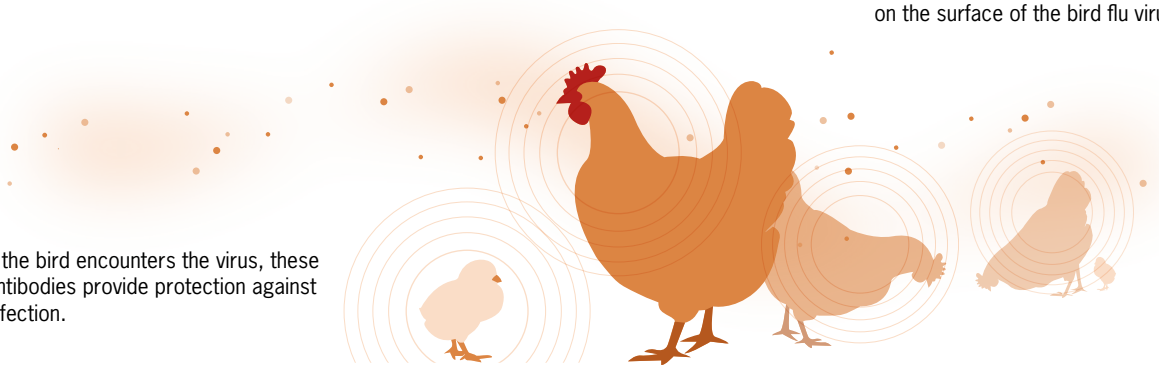
Genes from other virus species such as the avian flu can be added to the genetic material of the virus.



This creates an HVT vaccine with the H5 protein of H5N1 avian flu on its surface.



After vaccination a fertilized egg with an HVT-H5 vaccine, the chicken makes antibodies against a protein on the surface of the bird flu virus.



If the bird encounters the virus, these antibodies provide protection against infection.

A strong point of HVT vaccines is that a laboratory test can determine whether a vaccinated bird is infected with avian flu. A vaccinated chicken only has antibodies against the H5 protein; a chicken that has been infected with avian flu has a broader antibody profile. This differentiation is known as DIVA: Differentiating Infected from Vaccinated Animals. It is a safeguard for disease detection and control in the international poultry trade.

system, so that it recognizes the virus again later. We're going to do further research on that.'

Will a new vaccine be needed if a new virus variant emerges?

'These bird flu vaccines were developed by pharmaceutical companies with the aim of providing broad protection. If an H5N1 virus mutates in a few places around the world, it shouldn't make much difference. But if, say, an H7 virus emerges a year from now, as happened in 2003, the current H5 vaccines won't offer as much protection against it. But it's been H5 viruses that we've been dealing with since 2014, and that's also the variant we have found most often in wild birds in recent years.'

Do we have enough knowledge now to make a decision about bird flu vaccination in the Netherlands?

'Our study was small-scale and was conducted under laboratory conditions. In the follow-up study, chickens will be vaccinated on a pilot farm, just as is usually done with other vaccines. We want to examine some of those vaccinated chickens in the laboratory in Lelystad at different moments to analyse how well they are protected. That way you can see whether the vaccine is just as effective under everyday conditions. That project will take quite a long time because we also want to study the long-term protection offered by the vaccine.

'We will pass our results on to the Ministry of Agriculture, Nature and Food Quality, which will develop policy in consultation with the poultry industry. Will bird flu vaccination soon become compulsory? Will it be the farmer's choice, or a regional decision? These are questions that policymakers have yet to answer.' ■

www.wur.eu/birdflu

Secret histories rise up from the bog

Over thousands of years – a much longer timespan than previously thought – human bodies were left in the bogs of northern Europe. There were peaks and troughs in the frequency of this practice, as a comprehensive research project has now shown. Why? That is a riddle still to be solved.

TEXT ROELOF KLEIS **PHOTO** ALAMY

The Tollund Man, a bog body found in Denmark in 1950. The man lived in the fifth century BCE and was probably killed by hanging. Such finds have shaped our ideas about bog bodies – incorrectly, according to recent research.

> ‘You’re staring a prehistoric human in the face’

Bog bodies capture the imagination. An aura of mystery surrounds the well-preserved mummies. Who were these people and why did they meet their end in the bog? Were they ritually sacrificed, killed in some other way, or did they just get lost and drown?

Landscape archaeologist Roy van Beek, of the Soil Geography and Landscape chair group and Cultural Geography chair group, has long been fascinated by this subject. ‘It’s great material for an archaeologist,’ he says. ‘This is the closest you can get to someone who lived that far in the past. With the best-preserved mummies, like the Danish Tollund Man from the fifth century BCE, you can still see the stubble on the chin. You’re staring a prehistoric human in the face.’

Popular conceptions of bog bodies stem from finds of well-preserved mummies like the 16-year-old Yde Girl, who was strangled around the start of the first millennium CE. Incorrectly, says Van Beek. ‘For a long time, we’ve had tunnel vision, based on a small set of finds of bog mummies. The books about these fill many bookcases, creating a particular idea about bog bodies, which assumes that most of them date from the Iron Age and Roman times, and were the victims of ritual sacrifices to the gods. But this idea is largely unfounded.’

PARTIAL SKELETAL REMAINS

Van Beek and an international team of experts charted all the bog bodies in northern Europe, from Ireland to the Baltic states. The survey was not restricted to the well-preserved mummies, but also included skeletons and skeletal remains. ‘If you take a broader view of it, you get a different story,’ he says now. ‘At first, I too assumed that there was no comparison between those mummies and partial skeletal remains – that they were two totally different phenomena. Until the penny dropped one day. The Yde Girl is essentially no different from a find of a remnant of bones elsewhere. The preservation conditions in the bogs, which can vary widely, determine what an archaeologist finds. That’s why you’ve got to put the finds together. Besides, mummies may have nails, skin, hair and sometimes you can even see what their last meal was, but they don’t usually contain bone material. A mummy is a bag of skin. Skeletons yield different information, and sometimes even the cause of death.’

PUZZLING PATTERN

The results of the study were published early this year in the journal *Antiquity*. The database of bog bodies that was created includes more than 1000 individuals across 266 sites, and spans seven millennia a much longer timespan than previously thought.

It is also striking that the finds are not evenly distributed over time. In fact, statistical analysis reveals a puzzling pattern of seven peaks with long periods between them from which significantly fewer or even hardly any mummies or skeletons have been found. Why is that? ‘That is the key question,’ says Van Beek. ‘The first finds are from the Neolithic period starting from 5000 BCE. It was in those agricultural communities that human populations began to cluster for the first time. And that was also when peat formed on a larger scale. You don’t get bog bodies without peat. But why are there peaks and dips in their occurrence? I don’t know. Maybe it has something to do with cultural preferences and customs. In the case of the big spike in finds from the Iron Age and Roman period, some of the bodies can perhaps indeed be seen as ritual sacrifices. But there won’t be just one clear reason behind those spikes. There will be a complex interplay of factors. You can’t lump all those corpses together.’

The idea that bogs served as burial grounds has been ruled out, according to Van Beek. ‘We know quite a lot about what a normal burial was in this period. You have the dolmens, the burial mounds, the urnfields. Bog bodies are a deviation from these. The question is why these people were not entitled to a normal burial. Were they criminals, people with disabilities, or outcasts in some other way, who were rejected by their society? Besides the sites where a single individual was found, you have places where bodies were repeatedly deposited. Cult sites of some kind, where sacrifices were made. And in such places, you also come across quite a few child corpses as well as weapons, jewellery, animal bones and pottery.’

Van Beek emphasizes the importance of conserving the peat bogs. ‘Not just for the sake of their biodiversity, but also because they have things to tell us about who we are. They are important cultural archives.’

VIOLENCE

Less than 20 per cent of bog bodies were demonstrably killed by violence. But Van Beek is cautious about this. ‘You can by no means always establish whether violence was involved. Many of the finds were made between 1880 and 1950. Not everything was well conserved and recorded. We have to work with whatever there is. This study is the first to include Central and Eastern Europe. There are vast peat bogs there – peat is still cut in the Baltic states. And yet there haven’t been as many bodies found there as I had hoped. That might be because finds just weren’t recorded. That is the tragedy of an archaeologist’s work.’ ■

www.wur.eu/stories-peatlands

‘The Netherlands is not as polarized as we think’

Sanne Kruikemeier and Rens Vliegenthart, two newly arrived professors of Communication at Wageningen, study the influence of traditional and social media and politics on public opinion. ‘The main thing the media influence is the setting of the agenda.’

TEXT TANJA SPEEK **PHOTOGRAPHY** JUDITH JOCKEL

So how do they consume news themselves? The two new Wageningen professors of Communication exchange curious glances. They have been recruited to WUR to contribute their knowledge of communication research. An important field at a time when public discourse on Wageningen topics such as nitrogen and the climate seems to be getting polarized.

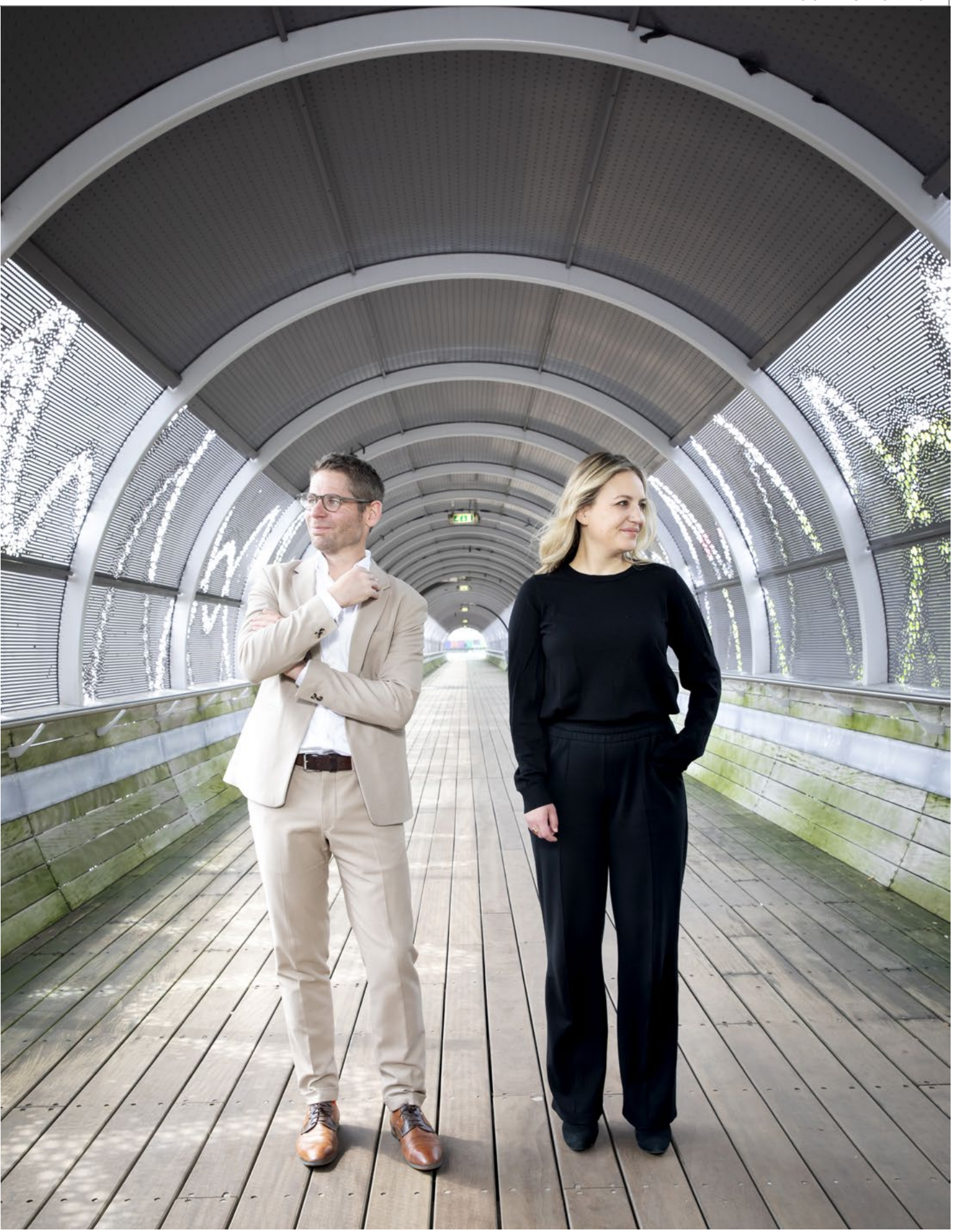
‘I always read the newspaper,’ begins Sanne Kruikemeier, professor of Digital Media and Society. ‘And I deliberately switch between newspapers. I’ve been reading *NRC* for a while, and now I’m reading the *Volkskrant*. My research is about digitalization, so I’m also on all the online platforms, like Twitter, Instagram, and even TikTok. If you use it yourself, you understand what’s going on better. And I purposely don’t use any ad blockers, so I can see what kind of ads I get then.’

Her colleague Rens Vliegenthart, chair of Strategic Communication, mostly follows the news digitally, but makes much less use of social media: ‘Only Twitter and LinkedIn.’ That’s the big difference between the two researchers. Vliegenthart’s research focuses mainly on traditional media, such as newspaper and television. ‘The old stuff’, as Kruikemeier teasingly calls it. ‘But that distinction has become much less relevant. Old and new media influence each other,’ says Vliegenthart.

The two professors have been doing a lot of research together for a long time now. They study the triangle of media, politics and society, and the dynamics between the three. They worked together for years at the University of Amsterdam, and joined the Strategic Communication chair group one year ago in quick succession. There, they will apply their experience to Wageningen themes such as sustainability, climate change and health. ‘That was one of the attractions of Wageningen for us. And the opportunity to make the move together was another plus.’

FALSE DICHOTOMY

What they have in common is the way they both look at all the news from a researcher’s point of view. Vliegenthart: ‘I can’t watch talk shows anymore. They are so predictable. Suppose a new nitrogen report has come out. Then the programme invites an expert, a scientist from Wageningen perhaps, who offers factual information. Then they bring in someone on the other side whose narrative is driven by emotion. That is a false dichotomy, of course, but it is typical of how the media work. They look for the extremes.’ >



SANNE KRUIKEMEIER (37)

2022 Professor of Digital Media and Society, WUR
2020 Associate professor of Political Communication and Journalism, University of Amsterdam
2014 Assistant professor of Political Communication and Journalism, University of Amsterdam
2014 PhD, University of Amsterdam

RENS VLIEGENTHART (43)

2022 Chair-holding professor of Strategic Communication, WUR.
2013 Full professor of Media and Society, University of Amsterdam
2011 Associate professor of Political Communication, University of Amsterdam
2007 Assistant professor of Political Communication, University of Amsterdam
2007 PhD, Vrije Universiteit Amsterdam

'I once spoke to a journalist who said "Nuance is a lovely city in France, which doesn't belong in the media." But of course it belongs there,' Kruikemeier insists. 'The media often assume the public don't like nuances. This dynamic, and the media's power to shape it, is something we call media logic.' Vliegenthart does think there are positive exceptions, though. 'Two days before the Dutch parliamentary elections, I was invited onto the news magazine programme *Nieuwsuur* to explain how those elections and campaigns work. I was given the chance to offer some depth and nuances.'

The advent of social media was a fascinating development in the triangle of the media, politics and society. On platforms like Facebook, politicians could now address the public directly, without the mediation of traditional media like newspapers and television. Kruikemeier did her PhD at the University of Amsterdam on this new dynamic. 'At the start of my research in 2011 I mainly looked at the positive role of social media. I studied the US elections at the time of Obama's re-election.' She examined the mobilizing power of social media, which have a demonstrable capacity to get people excited about political issues. 'But later, what with Trump, Brexit and Covid-19, the scope for direct and targeted communication came to be seen in a negative light because of all the misinformation and disinformation.'

One of the big research questions is how strongly media and politics influence the process of opinion formation. Vliegenthart: 'The main thing the media influence a lot is the setting of the agenda. You can see that with. Two years ago, no one was interested in the subject. Now they're talking about it everywhere, even in a diverse media landscape like the Dutch one. But at the same time, the media's influence on opinion is smaller and less straightforward. People who were already leaning towards the BBB's views flip under the influence of the torrent of news about nitrogen: it can make voters who favour parties like Forum or CDA vote BBB. There is no effect on voters at the other end of the political spectrum, though: however many talk shows with Caroline van der Plas they watch, they won't vote BBB.'

It has become harder for politicians to exercise a lot of influence and set the agenda. But there are exceptions to that too. 'Obviously, Caroline van der Plas has been very successful at this. She did not miss a single chance to appear in the media and that's how she managed to keep nitrogen and her standpoints high on the agenda.'

One study political influencing of voting behaviour was conducted by Kruikemeier with funding from a Starting Grant from the European Research Council (ERC). Starting in 2020, she studied the power of political parties' advertisements on Facebook during election campaigns. A campaign strategist on the platform can determine which target group will see which ads. But the effect of that was found to be small. 'It mainly keeps voters on board with a party they already had a preference for,' says Kruikemeier.

But the EU wants to ban this form of advertising nevertheless. 'That's frustrating,' says Vliegenthart. 'The fact that the group you are doing it for is doesn't make use of your research results.'

DISPROPORTIONATE ATTENTION

Besides online influencing, one of the serious concerns of our time seems to be increasing polarization. But the two professors have their own take on this. Kruikemeier: 'We in the Netherlands are not as polarized as we think we are. Of course, there are a few extremes, but above all there is a very large group with centrist views. Those small groups with extreme views get a disproportionate amount of attention in the traditional and social media. Yet actually, their influence is limited.'

The professors agree, though, that it is a different story in the US, where polarization is a much bigger

> ‘The extreme views get a disproportionate amount of attention, yet their influence is limited’

problem. That is largely due to the two-party political system. ‘Because of that, both politics and the media are a lot more polarized there. Just look at a channel like the Republican Fox News. It reports on politics from a strongly biased perspective and is not above attacking the Democrats either,’ says Vliegenthart. ‘It’s a serious problem there. Something like the storming of Capitol Hill rocks the foundations of your democracy. Research shows that the media play a crucial role in such things. And that dynamic was visible long before Trump.’

In the Netherlands, Vliegenthart sees plenty of factors a mitigating polarization: the multiparty system, a strong public broadcaster and a diverse media landscape. ‘Our TV news is very informative and is watched by a lot of people. There isn’t very much fake news going around and we still have a shared sense of what matters and which political issues are important. Except among the minorities with extreme views, of course. We saw that with Covid, when they began to create their own reality and became more and more extreme about it. We shouldn’t ignore that. But the moderate majority is still large.’

Moreover, concern about increasing polarization is not new. ‘In lectures, I often use a 1977 quote from the comedians Van Kooten and De Bie, in which, they express their concern about polarization, the role of the media and how it’s going to get worse and worse in future generations.

GRAZING ON NEWS

The researchers see a lot of positive things in their studies of changing media use. For example, against the backdrop of concerns about the general public being poorly informed, they studied news avoiders. But they didn’t find many habitual news avoiders. Vliegenthart: ‘People do occasionally boycott the news, or a particular news topic such as climate change, because they find it too distressing or can’t do anything about it anyway. Increasingly, people tend to graze on news. They might see very little of it for a while, and then suddenly take an interest in a particular topic.’ This also reflects the way topics can go in and out of the news. ‘Last year the war in Ukraine was very big news, and now nitrogen is. And of course the media play a big role in that.’

Media use is changing rapidly, especially among young people. Kruikemeier: ‘The first thing I bought when I left home was a television. Students don’t have those now, so we think they don’t follow much news. But a platform like NOS Stories on Instagram has nearly a million followers. That’s an awful lot. I suspect that if you see what information young people are following, the difference is not so very big.’

In Wageningen, both professors want to analyse how climate change is covered in the media and in politics. Vliegenthart: ‘In the US, you see climate reporting becoming increasingly political. It used to usually be scientists who talked about it in the media. Now it is more often politicians who get to air their views.’ The researchers want to find out whether this makes a difference to the formation of public opinion.

Under the professors’ supervision, a PhD student has started research on whether this reversal is taking place in the Netherlands too. The aim of the study is to analyse how the climate is discussed in Dutch political fora, and on traditional and online media, and how players influence each other. ‘Are the media responding to the politicians, or are the media that polarize this issue playing a role too?’ Kruikemeier wonders.

BOXING RING

In April, WUR organized a dialogue on framing in the food debate, during which Vliegenthart summarized his knowledge on dealing with polarization in a mini-lecture. The debate pitted the ‘techno-optimists’ who believe in using innovation to produce enough food against the ecologically-inclined ‘prophets’ who believe in smaller-scale and nature-friendly agriculture. ‘I didn’t know anything about the difference between these two camps. But that’s what I came to Wageningen to learn about. After a film and a discussion, Vliegenthart and others reflected on the debate itself. ‘I saw that the participants had very divergent views on the best form of food production. It was good to talk on a meta-level afterwards about the dynamics of the discussion: looking at your own role a bit more objectively, questioning how productive it is to take very strong positions, and noting where you see framing taking place.’

‘It is fine to take up polarized positions on an issue, provided you are clear whether you are talking about the same issue. But afterwards it’s important to keep talking. It must not get to the point where you never want to see your opponent again. You need each other and there’s a place for solutions coming from both sides.’ ■

www.wur.eu/strategic-communication

Plastic repairs itself

Researcher Sybren Schoustra has developed a magic new plastic that can change shape. The discovery is not just extraordinary, it is also promising. It could make hard plastic reusable, for instance.

TEXT NICOLE VAN 'T WOUT HOFLAND **PHOTO** GUY ACKERMANS

Schoustra takes some scissors and cuts a rubbery piece of dark-red plastic in half. Like a magician, he holds the two pieces up to show his audience they really are separate, then pushes them together. A few minutes later, the two pieces have merged into one again. At the beginning of March, Schoustra got a PhD for his work in the Organic Chemistry chair group on this new, recyclable plastic. 'If you look carefully, you can still see the line where I cut the plastic,' says the researcher, pointing to the small piece of plastic. But 24 hours later, there is hardly any sign of the cut. 'We can make the plastic softer or harder, more elastic or more flexible by changing the mix of ingredients,' he elaborates.

The piece of plastic looks perfectly normal, but at the molecular level it is quite unusual. The building blocks of plastic form long chains that are kept in shape by strong crosslinks. 'You could compare it to how the strands of a football goal net are knotted together,' says Schoustra. In regular plastic, the knots are permanent, but not in Schoustra's new plastic. 'We can disconnect those crosslinks and then connect them again.' In fact, the plastic itself restores the crosslinks. And that's how broken pieces of plastic can grow back together.

PROTOYPE

These kinds of self-healing polymers, which organic chemists call vitrimers, have been around since 2011. 'Mostly, they have only been described in the literature, and there was just one prototype,' explains Schoustra. The vitrimers described in the literature have varied characteristics, but what they have in common is the reversible crosslinks between the building blocks, thanks to which the material can be changed again and again.

> ‘I threw the chemicals together and it was an instant success’

Researcher Sybren Schoustra with the self-healing plastic: the snipped-off piece will 'grow back' on.

Schoustra embarked on his experiments four years ago bursting with ideas. ‘I combined the molecular structures of vitrimers that had been described in the literature with my own ideas.’ As an organic chemist, he thinks in terms of molecular structures. ‘I can tell right away from the structure what properties a material has. So I could picture the molecular structures of the plastic in my mind.’ With that picture in mind, the PhD candidate walked into the lab some six months after the start of his research and mixed four chemicals to make the plastic he had visualized. ‘It was an instant success.’ Schoustra is still astounded by this, three and a half years later. ‘The plastic regenerated itself automatically without me having to apply heat, pressure or anything else.’ He used that first version as his starting point for further work. ‘I came up with tricks to make the plastic more elastic or flexible, for example by replacing one of the ingredients.’

BOX OF TRICKS

At the end of his PhD project, Schoustra had a box full of ingredients. ‘I sometimes call it my Lego box: I can use a handful of basic building blocks to make an endless range of new products.’ He might make a plastic that is malleable at room temperature, or one that stays hard up to temperatures of 150 degrees Celsius. The latter is useful for components that are exposed to heat, such as car parts. ‘The shape of the molecular network determines the maximum temperature at which the plastic remains solid.’ Schoustra refers again to the football net example: ‘Lots of knots make for strong material, while fewer knots lend the plastic flexibility.’

In future, this new plastic could help reduce the amount of plastic waste. ‘At present plastic waste gets incinerated, and outside Europe sometimes even buried,’ says Schoustra. With a bit of heat, you can remould the Wageningen plastic into a new shape and reuse it. And there will no longer be a need to replace the plastic in shoes or car tyres because of tears or minor damage. But we are not there yet, warns Schoustra. ‘Our plastic looks great in the lab and works as we want it to, but we’ve got to investigate whether the material behaves the same way when we incorporate it into cars, for example.’ Schoustra himself is taking a little break from science. ‘The time has come to be spontaneous. I’m moving to Sweden next month and I’ll see where life takes me.’ But that doesn’t mean Schoustra is hanging up his lab coat for good. ‘I can see myself combining creativity with science some time in the future.’ ■

www.wur.eu/selfhealingplastic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Agents of change in Africa

Increasing food security in Africa will require far-reaching changes. The African Food Fellowship brings together frontrunners from the African food sector so they can join forces and learn about food systems. 'The Fellowship is an alliance in which the participants embark together on a journey towards a more sustainable food system.'

TEXT MARIANNE WILSCHUT **PHOTO** CIAT/GEORGINA SMITH **ILLUSTRATIONS** WUR/PETRA SIEBELINK

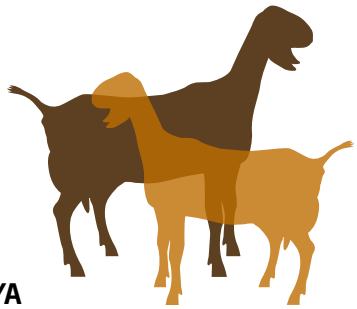
'Projects that aim to enhance food security in Africa are often focused on technical or process-based solutions,' says Joost Guijt, director of the African Food Fellowship and knowledge manager at Wageningen Centre for Development Innovation. 'But who will implement such solutions and rethink what goals they are meant to reach? In order to put these plans into action we need a new generation of leaders in the agri-food sector.'

The African Food Fellowship was set up to bring this new generation together to exchange knowledge, experiences and inspiration about changing food systems. Its 10-month Food Systems Leadership programme brings together Kenyan and Rwandan professionals from many backgrounds such as horticulture, aquaculture and agricultural finance. Guijt: 'The Fellows come from national and local governments, NGOs, businesses and other community or farmers' organizations. In seven modules they gain insight into the broad context of the food sector and learn to identify and analyse barriers to change. They also have to design an action plan based on their own idea for a transformation. They spend an average of four hours a week on studying and online training. There are a few in-person events in between. The Fellows do this alongside their job or voluntary work.'

'We hope to train leaders in food system change. Angela Odero, one of our Fellows from Kenya, is an ardent campaigner against the sex-for-fish principle.' The principle is an extreme example of power structures in the food system and is at work at some fish markets in the Great Lakes region of Africa. Women traders at these markets cannot obtain fish to sell without paying a high rice: they have to have sex with the fishermen who supply the fish. 'The Fellowship supports Angela Odero in gaining influence in her battle for equal treatment. With the help of the other aquaculture trainees in the Fellowship, she is working to increase her impact. By connecting professionals in the same sector and offering them additional knowledge, the African Food Fellowship seeks to enable its Fellows to identify and break these patterns and powers so that the food sector can be more inclusive and sustainable,' says Guijt. After following the leadership programme, the Fellows continue to collaborate in the Country Food Fellowships – one in Kenya and one in Rwanda. The Country Food Fellowships organize an annual Transform Food Festival, inspiration sessions and other ways of putting the Fellows in the spotlight, so that their work gets the attention it deserves. Guijt: 'Enhancing each other's network is very important. The Fellowship is literally an alliance in which the participants undertake a journey together towards a more sustainable food system. We have already seen a number of positive examples of Fellows who started companies or have earned scholarships and prizes – such as Grace Njoroge, who was included in the top 100 women in Fintech by the Bill & Melinda Gates Foundation.' >

The African Food Fellowship is an initiative of Wageningen University & Research and the consultancy firm Wasafiri, and is supported financially by the IKEA Foundation through University Fund Wageningen.
'We are trying to find long-term solutions that can improve the food system,' explains Nico Janssen, the agricultural livelihoods programme manager at the IKEA Foundation. 'We are convinced that building and strengthening local capacity is key for enhancing a robust and sustainable food system. The Fellows are among the people who will have to implement that change and we are happy to support them.'
The third cohort of 80 Fellows from Kenya and Rwanda will start on the leadership programme in September. Guijt: 'From the feedback we got from the two first cohorts, we decided to organize more in-person sessions instead of online ones to give participants more opportunities to meet and interact with each other. The programme keeps on developing: we are laying the track while the train is already moving.'
After a successful start, in 2022 the IKEA Foundation decided to extend their support for the initiative for another five years with a contribution of 8.8 million euros. Janssen: 'Our ambition is, hopefully with help from other financiers, to expand the initiative to other countries across Africa. In the long term the Fellowship has to be able to support itself with tuition fees and contributions from local governments.' Guijt is positive about that. 'The Minister of Agriculture in Rwanda herself asked us to implement the programme in Rwanda, an example of government commitment to changing the food system. Hopefully other countries will follow.' ■

www.africanfoodfellowship.org



SULEIMAN KWEYU, KENYA

'Small-scale farmers form the backbone of our economy'

'Just one goat can make a big difference to a disabled farmer in Kenya Kakageme County,' explains Suleiman Kweyu, the founder of Agro-Kenya, an NGO that trains and supports smallholder farmers with a disability in western Kenya. 'Goats provide milk and their young can be sold. Compared to cows, goats are easy to manage. They don't need much land, they mature fast, they are not very disease-prone and they reproduce fast.' Agro-Kenya provides the farmers with goats and training on keeping goats. Kweyu: 'A lot of these farmers lost an arm or a leg while working as contract labourers in the sugar cane factory. These disabled workers are often dependent on their families because there is a social stigma around disability. Farming goats can help them gain financial independence.'
Together with 30 other Kenyans, Kweyu was selected to participate in the African Food Fellowship in 2021. Kweyu: 'It was a good opportunity to connect with other professionals in the food sector. From another Fellow who works in aquaculture, I learned a lot about fish farming – knowledge which I've been able to share with some of the farmers we work with. In return I have been able to share my knowledge, experience and network in relation to the goat project with other Fellows.'
As the son of a smallholder farmer, Kweyu, who has a Master's degree in Financial Economics, is highly motivated to improve the lives of marginalized farming communities. 'Approximately 60 per cent of all the food consumed in Kenya is produced by smallholder farmers. They are the backbone of our economy. If you help this group, you can increase food security in Kenya.'
Via LinkedIn and other platforms, Kweyu is still in touch with the other Fellows. 'Even though we haven't been able to meet up in person a lot, the connection is still strong. Sharing knowledge is so important.'

VALENTINE UWASE, RWANDA

‘I have learned how to analyse the food system’

Flipper will see the light of day soon. Flipper is not a helpful dolphin, but an app that connects farmers and buyers in Rwanda. ‘The middlemen in the supply chain often make more profit than the farmers,’ says Valentine Uwase, the creator of Flipper. ‘Via this software, buyers will be directly linked to farmers. Buyers will be able to see how many potatoes, tomatoes or other crops, farmers have ready for sale. For the farmer, the app makes it easier to negotiate the price directly with the buyer.’

In 2021 Uwase was part of the first group of Rwandan Fellows of the African Food Fellowship. ‘I have benefitted greatly from the input of other Fellows in developing this app,’ she says. Uwase works in Kigali as Monitoring, Evaluation and Learning manager at Land O’Lakes Venture37, an International NGO. ‘We focus on improving the business operations of agricultural cooperatives in Rwanda. We provide training in governance, business development and finance. We also do a lot of research in the cooperative sector and annual performance assessments, which I coordinate. I’m used to doing research, but the Fellowship really taught me how to analyse the food system as a whole, with prognoses and scenarios.

‘An important motivation for me to apply for the programme was that I wanted to contribute to improvements to food production. It can be increased and farmers must learn new techniques to help them farm in a more climate-proof way and make a bigger profit. In my view, more inclusiveness, strong collaboration and more information-sharing are crucial to achieving that. The Fellowship is instrumental because it brings together young professionals from the food sector with different backgrounds so they can learn from each other.’

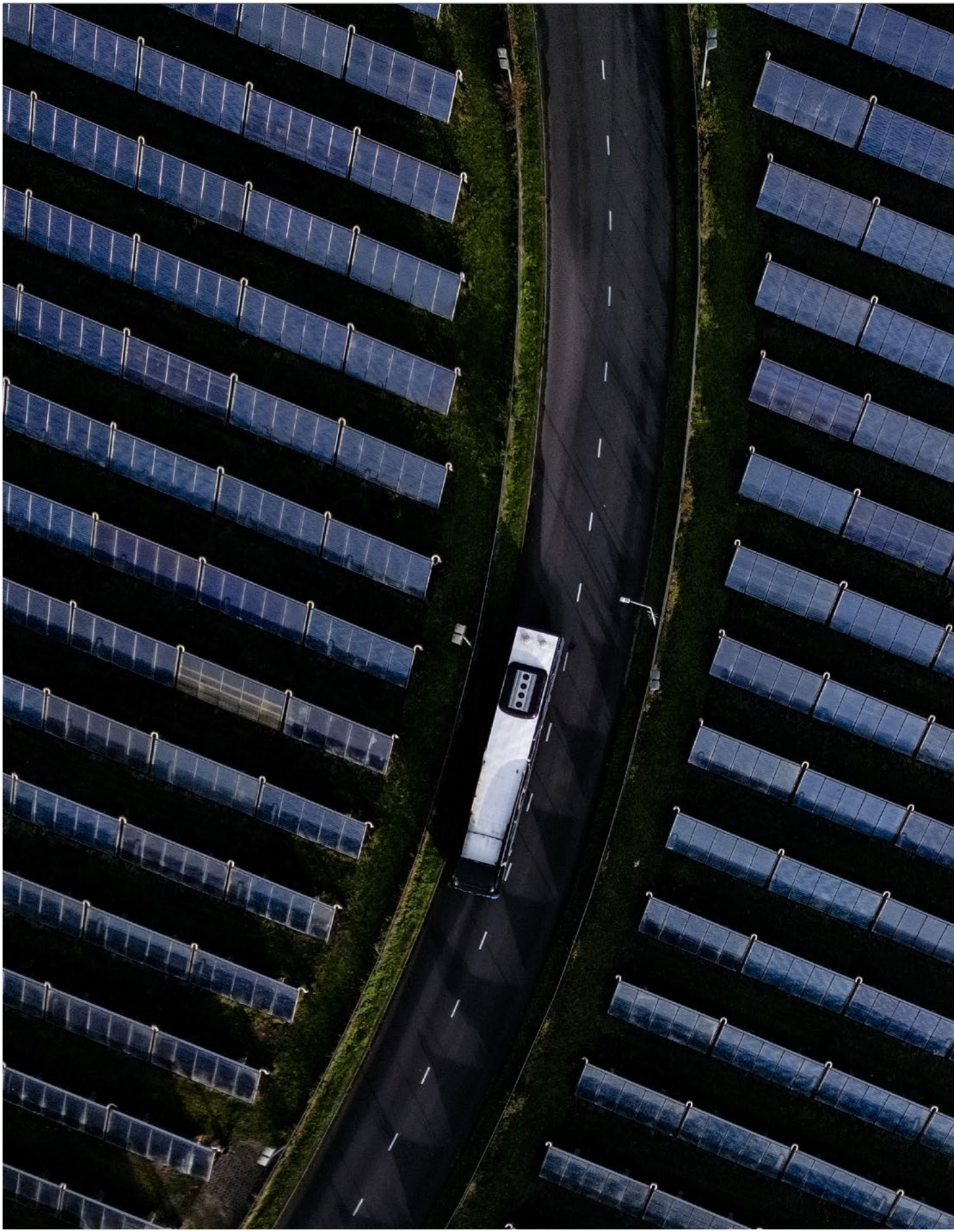
BRIAN NEZA, RWANDA

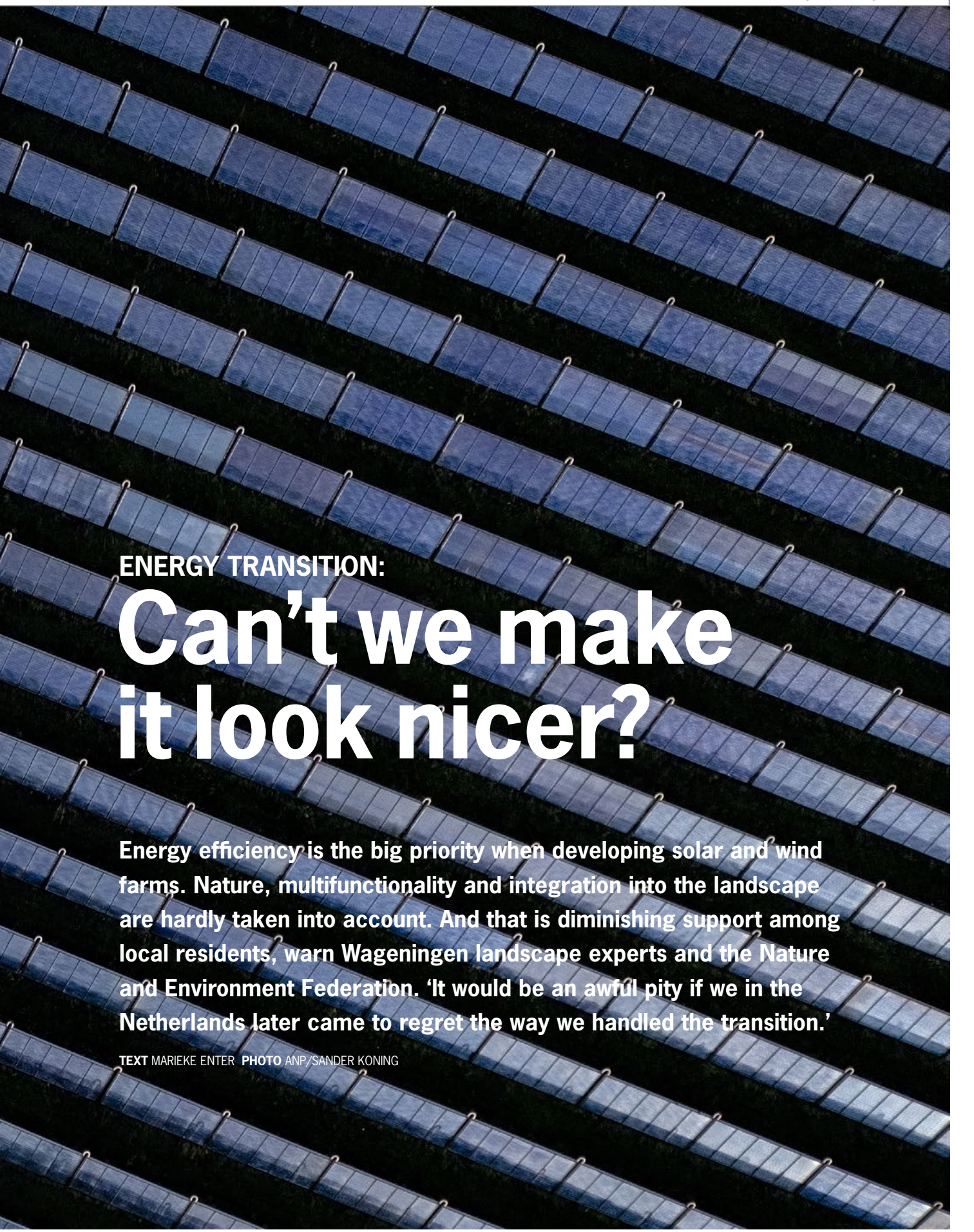
‘I am working on a plan for getting more young people involved in agriculture’

Permanent soil cover, minimum tillage, and crop diversification are the key principles of what is known as conservation agriculture, explains Brian Neza. He is project manager of a programme run by the Peace and Development Network in Rwanda, which helps smallholder farms to improve their climate-smart agricultural practices. Neza also works as a trainer in Farmer Field Schools. ‘In these schools, groups of farmers learn about conservation agriculture, soil fertility, pest control and post-harvest handling and storage. We also address financial literacy with lessons in budgeting, as well as explaining how communal financial initiatives such as village savings and loans associations work.’

For Neza, who is currently working on his dissertation for an MBA, this wasn’t enough. ‘I know how to work with smallholder farms, but I want to take it a step further. That’s why I applied for the Fellowship. I want to know more about a systematic approach to enhancing food security.’

Neza is one of the 31 Rwandan Fellows of the second cohort of the African Food Fellowship which started in November 2022. ‘We need more people in the food system who look at the bigger picture. Who have more insight into how the market works and how farmers can adjust their production accordingly. What I like about the programme is that it brings together people from different countries and walks of life. I wanted to be somewhere where my ideas get challenged and where there’s room for discussion. Apart from addressing complex issues such as how do we bring about a shift in power in the food industry, I also learn how to improve soft skills such as communication. For the Fellowship I’m now working on a plan on how to involve more young people in agriculture. If we want to improve the food system in Rwanda, we must make it more accessible and appealing to young people because they are more accepting of change and technological advancements.’





ENERGY TRANSITION:

Can’t we make it look nicer?

Energy efficiency is the big priority when developing solar and wind farms. Nature, multifunctionality and integration into the landscape are hardly taken into account. And that is diminishing support among local residents, warn Wageningen landscape experts and the Nature and Environment Federation. ‘It would be an awful pity if we in the Netherlands later came to regret the way we handled the transition.’

TEXT MARIEKE ENTER **PHOTO** ANP/SANDER KONING

‘Promising combinations with nature, landscape and agriculture are rarely implemented’

Anyone who drives through the Netherlands regularly can see that the Dutch energy transition is gathering momentum. The number of wind and solar farms is growing rapidly, and will continue to do so in the years to come. This growth is necessary in order to be generating at least 35 terawatt-hours (TWh) of sustainable electricity on land by 2030, as pledged in the Climate Agreement.

The government has delegated the task of deciding where and how these 35 terawatt-hours about a third of the country’s current annual electricity consumption should be generated in 30 energy regions. Each region has worked out its own regional energy strategy, RES for short. The Netherlands Environmental Assessment Agency (PBL) calculated at the end of last year that together, these strategies will suffice to meet the target in the Climate Agreement. But at the same time, PBL warned of the danger of stagnation – due not only to an overloaded electricity grid, but also to a potential lack of public and local government support.

That is not an imaginary danger, agrees Sven Stremke, associate professor of Landscape Architecture and scientific coordinator of the Wageningen Solar Research Programme. For years, he and associate professor Dirk Oudes have been researching large-scale energy landscapes, both in the Netherlands and abroad. Their book about it, *Power of Landscape*, came out in late 2022. In the book, written with Paolo Picchi of the Academy of Architecture, they explain why the spatial impact of the energy transition can be such a headache. Renewable energy generation requires more space than that of fossil energy, and what is more, often takes place close to residential areas.

DECLINING SUPPORT

The researchers note that so far, the energy transition in the Netherlands mainly takes the form of technical-looking, monofunctional solar or wind farms, which in size and design are neither a sight for sore eyes nor an asset to the community. Take the Dorhout Mees solar farm near Biddinghuizen, which is currently the largest in the Netherlands. It boasts more than 300,000 neatly contiguous solar panels on a surface area of 85 hectares. These large-scale, industrial-looking wind and solar parks do nothing for public support, so much is becoming clear now the time has come to implement the regional energy strategies. Plans for wind turbines have been met with resistance for some time, but it is a relatively new development that local residents are starting to object frequently to the construction of solar parks – and appealing against it in the highest administrative court. The plans are not always abandoned as a result, but an appeal procedure always causes a considerable delay, sometimes going on for years. Local government support for new energy projects cannot be taken for granted, either. For instance, wind turbines were recently banned by a number of municipal councils, including those of the municipalities of Voorne aan Zee (Zuid-Holland) and Altena (Noord-Brabant). This is exactly the kind of stagnation the PBL warned of in late 2022.

GENUINE CONCERN

It would not be fair to dismiss this public and local governmental resistance as just the ‘not in my back yard’

ECO LABEL FOR SOLAR PARKS

Wageningen researchers are closely involved in the development of the first quality label for nature-inclusive solar parks in the Netherlands. Together with other research institutes and several companies, they are investigating how the nature and soil quality on new and existing solar farms can be improved through design and vegetation management. Their research results will be translated into guidelines for a label. This EcoCertified Solar Label will guarantee added value for biodiversity. The project will run until the end of 2025.

PHOTO OLAF MOLENAAR

De Kwekerij solar farm in Hengelo in the eastern Netherlands combines energy generation with nature and recreation.

mentality, says Oudes. 'That term assumes a self-centred outlook, whereas the objections to large-scale energy parks also stem from people's genuine concern for their environment and the landscape,' he argues.

Stremke and Oudes' long-term research shows that the landscape quality of recent solar energy projects in the Netherlands is much lower than that of older examples, which were cutting-edge in their time. Take the much-praised solar farm De Kwekerij in Hengelo in the Achterhoek region, which was designed in consultation with local residents. There, energy generation, nature and recreation go hand in hand; residents can take a stroll and children can play there. Biodiversity is thriving there too, thanks to features such as a long hedge, indigenous flower mixes and wadis. De Kwekerij dates from 2016. Very few comparably nature-inclusive and multifunctional solar or wind farms have been created since then.

This is largely a matter of financial incentives, Oudes and Stremke explain. The Dutch government's current subsidy schemes target the greatest possible CO_2 reduction at the lowest possible cost. Factors such as multifunctionality, nature inclusiveness or blending into the landscape are low priority: energy efficiency comes first. This encourages developers to build solar or wind farms that may be super-efficient, but don't tend to do much for support from local residents.

'Up to now, the energy transition has mainly revolved around concepts such as technology, efficiency and maximizing profits. Why don't we assign equal value to things like the cultural landscape, people or nature?' Stremke wonders.

It is not that Stremke and Oudes are opposed to all large-scale wind and solar farms. 'At locations such as Wieringermeer in Noord-Holland or Noordoostpolder in Flevoland, they can be a perfectly good choice. But >

PHOTO ANP VINCENT JANNINK

PHOTO SHUTTERSTOCK

Multifunctional solar farms: shade for sheep and floating solar panels on a gravel pit.

they are only one of the options, and there are plenty of other possibilities,' says Stremke.
If popular support for the energy transition is to be maintained, the two scientists are convinced that solar and wind farms must quickly be made more attractive and more multifunctional. 'Promising combinations with nature, landscape and agriculture are rarely applied. It's the wrong way round: people have a better and better idea of what they do want, but they are getting get more and more of what they don't want,' Stremke notes. The Nature and Environment Federations (NMF) share this concern, which prompted the joint position paper 'Further with onshore energy generation', on an alternative, better approach to onshore renewable energy generation.

PERSISTENT MISUNDERSTANDING

The idea that the energy transition is hard to combine with other interests is a persistent misunderstanding, say Oudes and Stremke. 'Administrators habitually see landscape and energy transition as incompatible,' Oudes observes. 'They say: "We've got to do something about the energy transition, but it pains us because it will ruin our landscape". That is faulty reasoning, but it does colour how people view the energy transition.'
Thanks to that reasoning, the potential for combining, say, solar energy with nature, landscape or agriculture remains largely unexploited – with a handful of exceptions, such as fruit farms where fruit is grown under solar panels. At WUR's experimental farm in Randwijk, pear trees grow under solar panels which let light through in different ways. And in Babberich (Gelderland) and Olland (Noord-Brabant), commercial fruit growers grow fruit like raspberries, blackberries and strawberries under a protective canopy of semi-transparent solar panels. Wageningen researchers are monitoring the yields, both agricultural and solar, as well as the ecological impact of these systems.
There are opportunities for such 'dual use' in livestock farming too. Recent Master's graduate Emma Kampherbeek found, for example, that sheep in California graze more on plots with solar panels than on similar plots without. She thinks this is due to the protection the panels provide against heat and harsh weather conditions, which leads the sheep to graze under them for longer. Another factor is that the solar panels have an impact on the vegetation: the microclimate around the panels, with more shade and condensation, results in a higher protein content and better digestibility.
Of course, the Netherlands is not California, but Kampherbeek says there are parallels to be drawn, especially in view of climate change. 'The Netherlands has between twice and four times as many days with warm and tropical temperatures as it did 30 years ago. Meanwhile, Dutch livestock are already at risk of heat stress on almost a quarter of the days of the year,' she says. So solar panels could provide welcome shade and shelter for grazing animals.

CENTRAL GOVERNMENT COORDINATION

But there are still too few instances of this kind of dual use, in Oudes' opinion. 'Moreover, the spatial

PHOTO GUY ACKERMANS

PHOTO TNO / NORBERT WAALBOER

Pear trees under translucent solar panels; a cycle path made of solar panels.

quality of our surroundings obviously shouldn't depend entirely on what happens in individual projects. This should be under central government control,' he stresses.

The scientists' advice is to take the landscape as a starting point. They are referring to landscape in the broadest sense: the visible landscape, what it means to people, and its functions: food production, water storage, nature, culture, you name it. 'From that perspective, see which forms of energy generation are appropriate and have added value. What other social benefits could it offer: recreation, nature development, agriculture, or nitrogen reduction perhaps? In this day and age, you can't have one without the other,' says Stremke.

Oudes draws a parallel between the energy transition and the Room for the River programme, which was designed to improve the protection of the Dutch river areas from flooding. This 'relandscaping' was used to develop the areas concerned in consultation with local people. The outcomes included the creation of new nature areas and recreational facilities. Well-known examples are the side arm of the Waal near Nijmegen and the IJssel delta near Kampen.

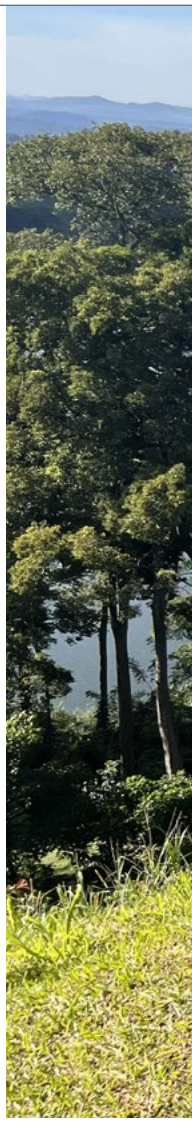
Oudes: 'There you can see the added value of a government that decides that a major hydraulic engineering project like that should be tackled from a broader perspective. So not just with the clear-cut goal of reducing the flood risk, but also based on the premise that the local community should benefit from it in terms of social value and spatial quality. And exactly what that means should very much be defined by local people.'

A landscape-inclusive approach to the energy transition is not necessarily the easiest way to go, admit the landscape experts, nor perhaps the fastest, at first. Oudes: 'But let's make sure we're not beating ourselves up in 10 years' time because of missed opportunities. It would be a terrible pity if the Netherlands later came to regret the way we handled the transition.' ■

www.wur.eu/solarresearch

WAGENINGEN SOLAR RESEARCH PROGRAMME

In the Wageningen Solar Research Programme, about 75 Wageningen researchers from different disciplines are working on a scientific basis for sustainable solar parks that benefit the economy, nature and the local community alike. The research focuses on six interrelated themes: landscape and spatial quality, community involvement, biodiversity and nature, agrivoltaics (combining energy production with food or feed production), meteorology and soil quality. The researchers collaborate regularly with members of the public, farmers, landowners, energy and technology suppliers, governments and civil society organizations.



9000 KILOMETRES OF LEARNING

Cycling to sustainable farms

Aisha Hassan and Lukas Paltanavičius set off from Wageningen on a cycling tour to visit European, Arab and African farmers who prioritize their soil and nature. The couple have been on the road for a year now. 'When Aisha told me about her dream on our first date, I was startled. Had she gone crazy?'

TEXT TANJA SPEEK **PHOTO** CYCLETOFARMS

On 10 May 2022, alumni Aisha Hassan and Lukas Paltanavičius got on their sturdy touring bikes in Wageningen. Clad in zip-off trousers, raincoats and cycle helmets, they crossed the Rhine on the Lexkes ferry and pedalled to the Ketelbroek food forest in Groesbeek. It was the first day of their big adventure. Dutch-Somali and Lithuanian respectively, Hassan and Paltanavičius were aiming to cycle from Wageningen to Tanzania, visiting regenerative farmers along the way. These are farmers who produce food while paying a lot of attention to the health of the soil and to biodiversity. The couple's mission? To learn from these farmers.

They have now passed through 12 countries and covered 6500 kilometres by bike. They also flew two sections of the journey: between Greece and Jordan because there turned out to be no boat, and between Egypt and Kenya to skip some unsafe regions of Africa. No one has come up with a comprehensive definition of what regenerative farmers do differently yet. Hassan and Paltanavičius describe it in terms of a number of principles: taking good care of soil life and biodiversity, with crop rotation and minimal use of pesticides and fertilizers.

TENT IN THE GARDEN

'This morning we cycled for nearly four hours and covered 47 kilometres,' says Paltanavičius, speaking from Uganda via an unstable audio link. 'In the afternoons, we work. We write for magazines, make our videos, call our contacts and arrange the next leg of our trip.'

At the start of their journey, they cycled further in a day, admits Hassan. 'We'd cover between 80 and 100 kilometres, but then we decided to take it a bit more gently. It's fantastic to get to make this trip, but it's not always as idyllic as it sounds. The travelling gets tiring. Sometimes we just long to spend more time in one place.' They usually pitch their tent in someone's garden every evening, adds Paltanavičius. 'And people often then invite us to stay in their houses.'

From their bikes, the two travellers see constantly changing landscapes. 'Now we are

> ‘We saw the effects of climate change in Kenya’

near Lake Victoria, the source of the River Nile, which we have been following for a long time. Beautiful. It is not as dry here as it is in Kenya, where we saw the effects of climate change,’ says Paltanavičius. ‘Lots of dead cattle, and even dead zebras on the road. That was shocking,’ Hassan adds.

They have passed a lot of monocultures of sugar cane or bananas along their way. ‘And sometimes mixed cropping, with bananas and coffee for instance. And grain, lots of grain. Uganda is the breadbasket of East Africa; the full trucks heading for Kenya keep on coming. Right now, everyone is working on the land, tilling it and sowing. Most of the farms are small-scale, with the whole family working in their fields. We are learning from conversations with these farmers too.’

NOTE IN THE LIBRARY

The cycling couple exchanged their first glances in the library of the Forum building on campus, in the quiet area, where they were both studying. ‘Lukas slipped me a note saying “It’s nice to sit in silence, but let’s talk one day”,’ recalls Hassan. On their very first date, Hassan told him about her wish to do a long cycling trip one day, from Cairo to Cape Town. ‘I was startled. Had she gone mad? I was alarmed by the >





Aisha Hassan and Lukas Paltanavičius share their experiences on www.cycletofarms.com, Instagram and YouTube.

very idea of doing something like that,' says Paltanavičius, who was doing a Master's degree in Biobased Sciences in Wageningen. Hassan got the idea for a long cycling trip during an Experience Day organized for WUR alumni. 'There I met an alumnus who had cycled from Cairo to Cape Town. The idea of visiting the farms came to me later'. Hassan did the Master's in International Development Studies at Wageningen.

'I was born in Somalia. My mother fled to the Netherlands with me when I was two months old. I wanted to do development work in East Africa, and I went to Tanzania during my degree course. But sustainable agriculture is very important to me too.' It all comes together on their journey. 'And how often do you get the chance to go on a long cycling trip? It was now or never.'

They made a start on realizing their dream by writing a project plan. What was the goal, what did they need, and what were the risks? 'And we selected farms to visit, a list that goes on growing. When we arrive at one farm, we always get suggestions of other places we should definitely visit,' says Paltanavičius.

'Of course, money was a big problem, but once we had worked most things out, we figured that must be solvable too. So we attracted sponsors and NGOs to support us.' Meanwhile, they are also earning some money themselves from their project. 'We write articles about our trip. And we are making a series of educational videos about what we are learning, for the Wageningen Farming Systems Ecology chair group.'

Which images stay with you the most?

Paltanavičius: 'The start of the Rift Valley in Jordan was very impressive. We crawled up the mountain by bike in the burning sun, but once you get to the top, you can see the road winding down for kilometres through a breathtaking desert landscape.'

Hassan: 'Jordan was altogether very special. It is terribly dry and yet the farmers there have smarts ways of getting the best out of the soil and growing food. For example, they plant clay pots next to the crops, and the roots then grow towards the pots and get their water from them. We ate delicious food there. They share the best they have with their guests there. Big bowls of nuts, fruit and vegetables, terrific falafel, delicious desserts – and they kept

> ‘In Jordan, the farmers have smart ways of getting the best out of the soil’

plying us with more. Sharing food is very important in their culture.’

What kind of people practise regenerative farming?

Hassan: ‘They are all inspiring people. In Austria, for example, we visited Alfred Grand. He put it nicely: “Here we grow food, soil and people.” What he means is that it’s all about the community around the farm as well as the crops. And we soon found out that this is true for many of these farmers. They want to connect people, to supply them with healthy food and to learn more about this approach to farming together.’

Paltanavičius: ‘Faddoul in Jordan was another very special person. We intended to make a short visit, but we decided to stay there for a week. He used to be a banker, but he switched careers. Now he has a small plot of land and is busy planning what he wants to plant on it. We had wonderful conversations with him about your place here on Earth as a human being.’

Do you get into dangerous situations too?

Hassan: ‘I was very scared when a cow trampled on our tent. If we had been lying in it, I don’t think it would have turned out well. And I was afraid our tent would be completely broken. After all, it has become our home. Fortunately, the damage wasn’t too bad.’

Paltanavičius: ‘The roads can be dangerous too. We realized that when we were still in Europe. There aren’t decent cycle paths everywhere. Tunnels are particularly unsafe for cyclists. They’re very dark, and you can hardly see a thing. We try to avoid those now.’

You were at COP27, the UN climate conference in Egypt?

Paltanavičius: ‘Yes, we got tickets for it. Our main aim was to be the voice of farmers, especially the regenerative farmers we had spoken to. We talked about the problems they face and the solutions they can offer. They come up with particularly good solutions for drought-prone areas. There weren’t many farmers present at the conference, which surprised us. We were also surprised that agriculture was only a minor theme.’

What will you do when you arrive at your final destination in Tanzania?

Hassan: ‘We might want to cycle on, perhaps to South Africa. We still have a lot to learn from this continent. But we are certainly going to take a long break in Tanzania. Eventually, we want to make a longer documentary film about our trip, to share what we have learned more widely. What we will do after that, we don’t know yet. We definitely want to continue working on regenerative agriculture. It feels like we have only just begun.’

‘Farmer Guilherme Sobral from Kenya told us: “The best thing you can do is to establish a good food forest, the second-best thing you can do is to establish a bad food forest.” What he meant is that you learn how to do things better as you go along. That is how we approach our project now. We are just getting on with it and learning more and more as we go along.’ ■

www.cycletofarms.com

AISHA HASSAN (28)

After completing her Bachelor’s degree in International Studies at Leiden University, Hassan obtained her Master’s degree in International Development Studies at Wageningen in 2021.

LUKAS PALTANAVIČIUS (28)

After a Bachelor’s degree in Agricultural Technology in Lithuania, Paltanavičius obtained his Master’s degree in Biobased Sciences at Wageningen in 2021.

LEAVING WUR A BEQUEST

‘Scientific research helps the world make progress’

What motivates people to donate to WUR? ‘Wageningen sees the importance of fundamental research, which I firmly believe in myself,’ says Ton van der Heijden, who is leaving a large proportion of his estate to WUR.

TEXT TESSA LOUWERENS **PHOTO** HARMEN DE JONG

‘I always thought I would leave part of my estate to a cause,’ says Ton van der Heijden. ‘But then something scientific, because I feel that’s what helps the world make progress.’ He wants to leave a considerable part of his estate at least to WUR, and his sister is considering the same idea. ‘Neither of us have children, nor do we have any immediate family members still living.’ Van der Heijden studied physics for several years, followed by a long and successful career in ICT. ‘I have always had broad interests. I live in the countryside and I’m interested in biology, ecology and sustainability. I havebookcases full of books about these subjects.’

Remarkably, Van der Heijden is not an alumnus. But he did know that Wageningen does a lot of research in the areas of his interest. ‘I had never been here before, so my sister and I planned a holiday in Wageningen. Then, later on, wespent a day on the campus at the invitation of University Fund Wageningen.’

The Van der Heijden siblings were given a guided tour and several talks on topics of their choice. ‘I let them know in advance which topics we were interested in, such as non-toxic crop protection, biodegradable plastic and the potential for using algae

‘We spent a day on the campus’

PHOTO ERGO MEDIAPRODUCTIES

and seaweed for CO_2 sequestration, food production and the production of biofuel and sustainable building materials. In these fields, WUR is a world-class institute.’

SYNTHETIC MATERIALS

It is important to Van der Heijden that the money is used to address the longterm challenges facing the world. ‘Plastic and synthetic materials are going to be a problem for a long time yet, and to me, our future food supply is another important issue, not least in relation to CO_2 emissions.’

Another reason WUR appeals to Van der Heijden is that it does not restrict itself to applied research. ‘WUR sees the importance of fundamental research, which is something I firmly believe in myself.’ He has therefore stipulated in his will that some of the money should be used for fundamental research.

Meanwhile, Van der Heijden tries to do his bit himself where possible. ‘I have solar panels and I had underfloor heating and a heat pump installed a few years ago. In the garden, I’m replacing paving with things like tree bark as much as possible. My sister thinks sustainability is important too. She suffers quite a lot from flight shame, in fact – which is a bit tricky given that she lives in Spain.’ ■

DONATING THROUGH YOUR WILL

University Fund Wageningen (UFW) is Wageningen University & Research’s philanthropic channel for people who want to contribute to science for a sustainable future, scholarships or the university’s heritage. The University Fund supports the development of academic talent, rewards excellent education and research and facilitates pioneering research within Wageningen University & Research.

Inherited share

Nowadays, more and more people are making wills in which they include one or more charities. One approach in the Netherlands is to designate what is known as an inherited share (this is also called a testamentary disposition). This could mean that you name a fund as one of the beneficiaries alongside any family members, friends and other organizations, thus entitling the fund to a share of the estate.

Another option is to leave a legacy. In this case, the will states that, say, University Fund Wageningen will receive a specified amount or a percentage of the estate. A legacy can also be used to leave a beneficiary an asset such as a house, a painting or a share portfolio.

It may also stipulate that the legacy should be used for a specific purpose such as research, scholarships or preserving the university’s heritage.

For more information on leaving money to WUR in a will: *www.universityfundwageningen.eu/legacy*

INTERNATIONAL

Foreign alumni would like a more active role

Foreign alumni would like to be involved more with the university and play a more active role. This finding comes from a survey by the Alumni Relations department.

Wageningen University & Research has large numbers of international alumni: over 16,000 alumni (26 per cent) are not from the Netherlands. Many international students return to their home countries after graduating, while others stay in the Netherlands or move on elsewhere. How are international alumni involved in the university? And what do they feel a need for? To find out, the Alumni Relations department carried out a survey. 'It showed that alumni view their connection with the university positively and they want to remain involved,' says Maarten van Schaik, Alumni Relations team leader. 'That's nice confirmation for us that there's still a demand for our role in providing that link.'

A surprise for Van Schaik was that alumni wanted to be more involved. 'Over half are open to the idea of a more active relationship with the university. Examples might be giving a talk at a secondary school to tell pupils about their degree course, or taking part in a feedback group.'

Van Schaik says it is important to investigate how relations with international alumni can be further enriched. 'For example, we may be able to strengthen collaboration with other universities or companies abroad via these alumni. And you can reach potential students through talks at secondary schools. Now we know that there is the enthusiasm, the next step is to see what this can look like in terms of the practical implementation.'

Info: alumni@wur.nl

FUNDS

KLV fund supports podcast makers

Alumnus Bernard Hazeleger is making a podcast series about Beekdal in Renkum with money from the KLV fund.

In the six-part Dutch-language podcast series Grondtonen, documentary maker Barend Hazeleger (Land Development B 1983) and Louis ter Huurne, a former councillor for Renkum, talk about their journey along Beekdal in Renkum, from the river's source to where it enters the Rhine. Their observations are supplemented by field reports and conversations with experts, including several from WUR, on topics including grave mounds, sheep grazing and the return of the wolf. 'The podcasts definitely invite debate and dialogue,' says fundraiser Arianne van Ballegooij of University Fund Wageningen. 'The dilemmas raised by the combination of nature, residential areas and industry are presented clearly and in an inspiring way.'

The podcast series was made possible with the support of the KLV fund, which was established using the remaining assets of the former Wageningen alumni society KLV. The fund supports one-off activities and new initiatives by and for alumni. It is intended primarily to encourage and facilitate public debate and dialogue in the WUR domain and for the development of new forms of alumni networks.

To listen to the podcast series, visit the usual podcast channels.

More information about the KLV fund: wur.nl/klv-fonds

REUNIONS

‘We are aiming for a festival atmosphere’

This year, the Wageningen Experience Day will be all about celebrating 105 years of Wageningen University & Research. That calls for a particularly big party.

On Saturday 7 October, WUR will host the third Wageningen Experience Day. Its theme: how will the Netherlands look in 105 years’ time? And how will Wageningen research have helped achieve that? Experience Day will be celebrated on a grander scale than in previous years. As well as alumni, WUR staff and their families will be invited. That means several thousand people are expected on campus, rather than a few hundred like last year. ‘The team is aiming for a real festival atmosphere,’ says Maarten van Schaik, Alumni Relations team leader. ‘There will be two talk shows with interesting guests, a performance by the comic and alumnus Rob Urgert, and visitors will be able to taste food prepared by young top chef Geneal Harreman.’
Campus building Omnia will be the main site for the festivities. However, like previous years, it will be a hybrid event with large parts streamed online at the digital campus. That allows international participants to get involved in the programme.
More information: www.wur.eu/wed

NETWORKING

Alumni meet a WUR delegation in Singapore

Wageningen alumni who live and work in Singapore met up on 4 April with a WUR delegation visiting Singapore. They ate together and alumni were able to network and share experiences. The delegation, which included rector magnificus Arthur Mol, visited local education institutions, science institutes and companies. ‘Singapore holds a significant position as a key market for WUR, given the current partnerships and potential future opportunities for expanding presence through emerging collaborations,’ says Kalyan Guntuboyina, Account Manager Asia at WUR who headed the delegation.
For more alumni meet-ups abroad, check out: *wur.eu/alumnievents*

CONNECT!

LinkedIn
As a Wageningen alumnus, you are part of a worldwide network of almost 60,000 Bachelor’s, Master’s and PhD graduates. You can keep in contact via the LinkedIn group *www.linkedin.com/groups/39958/*

Alumni at WUR.nl
Find all the information about activities, networks, study circles and funds for alumni at: *wur.eu/alumni*

Alumni events
A USA tour, an excursion to Cargill Animal Nutrition or a talk on nature-based solutions: there is plenty to do for WUR alumni around the world: *wur.eu/alumnievents*

Study Circles and Networks
The Wageningen alumni network has various independent Study Circles and Networks. They organize talks, excursions and networking gatherings and promote the interests of their discipline. *www.wur.nl/studiekringen-netwerken*

Support the University Fund
University Fund Wageningen (UFW) supports activities that make a difference for students and researchers at WUR. If you want to contribute to UFW’s mission, see *www.wur.nl/nl/donateurs.htm* for the options.

Alumni newsletter
Want to stay up to date on the latest developments, alumni’s personal stories, WUR courses and activities? Register now for the alumni newsletter at alumni@wur.nl

Moved house or job?
Let us know at: *www.wur.eu/changecontactinfo*

Prof. Heidy den Besten, Food Technology 2004, has been appointed professor holding a personal chair in the Ecology of Food Pathogens at WUR. 31 January 2023.

Nico van den Brink PhD, Biology 1989, has been appointed professor holding a personal chair in Environmental Toxicology in the Toxicology chair group at WUR. 18 January 2023.

Iris van 't Erve PhD, Molecular Life Sciences 2017 and Nutrition & Health 2017, has been awarded a Rubicon grant to do research on immune therapy for lung cancer at Stanford University in the US. 11 April 2023.

Prof. Jochem Evers, WUR PhD 2006, has been appointed professor of Crop Physiology in the Plant Sciences Group at WUR. 17 November 2022.

Prof. Louise Fresco,

Rural Sociology of the Non-Western Regions 1976, former President of the WUR Executive Board, received the Justus-von-Liebig Prize for World Nutrition on 30 November 2022 for her work, research, achievements and involvement in the field of food systems, nutrition and hunger. In addition, on 17 February 2023 Fresco was appointed to the George Sarton Chair in the Philosophy of Science in the Bioscience Engineering faculty at Ghent University. In November 2022, Fresco joined the Supervisory Board of Zweegers Equipment Group, which includes the former minister Cees Veerman.

Gerda Feunekes PhD, Human Nutrition 1989, has been appointed managing director of the Agrotechnology & Food Sciences Group. She succeeds Sjoukje Heimovaara, who is now the President of the Executive Board of WUR. 15 January 2023.

Joris Geurts van Kessel MSc, Environmental Protection 2000, has been appointed director of Water Safety, Rivers and Seas at the Ministry of Infrastructure and Water Management. 1 February 2023.

PHOTO GUY ACKERMANS

Annemiek van Vleuten MSc,

Animal Sciences 2007, has been made an honorary citizen of Wageningen. Van Vleuten is famous for her international social engagement and her unparalleled achievements in cycling. 13 April 2023.

Ingeborg Haagsma-Boels PhD, Food Technology 1996, has been appointed lector in the Protein Transition in Nutrition at HAS Green Academy. 1 January 2023.

Prof. Alfred Hartemink, Soil and Water 1994, has received the Presidential Award, the highest award of the Soil Science Society of America (SSSA). 10 November 2022.

Prof. Lammert Kooistra, Soil, Water and Atmosphere 1997, has been appointed professor holding a personal chair in Remote Sensing at the Laboratory of Geo-Information Science and Remote Sensing at WUR. 1 December 2022.

Birgit Loos PhD, Plant Breeding 1989, has been appointed general director of Wageningen Food Safety Research. 1 January 2023.

Martine van der Ploeg PhD, Soil, Water and Atmosphere 2003, has been appointed professor of Hydrology and Quantitative Water Management at WUR. 1 December 2022.

Wieke Pot PhD, WUR PhD 2020, and Wouter Peters, WUR professor of Meteorology and Air Quality, have been appointed new members of the Scientific Climate Council (WKR) by the Cabinet. 27 March 2023.

Prof. Rob Roggema, Landscape Architecture 1990, has been appointed Distinguished Professor of Regenerative Culture at Tecnológico de Monterrey, Mexico. 1 November 2022.

Prof. Louis de Smet, Molecular Sciences 2001, has been appointed professor holding a personal chair in Advanced Interfaces & Materials in the Organic Chemistry chair group. 6 February 2023.

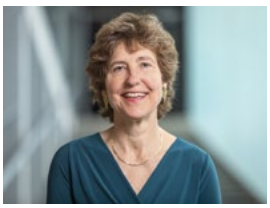
Michiel Uitdehaag MSc, Land-Use Planning Sciences 2003, has been appointed mayor of Venray as of 11 July. 7 February 2023.

Annemarie Wagemakers PhD, Human Nutrition 1988, has been appointed professor holding a personal chair in Participatory Community Health Promotion in the Health and Society chair group at WUR. 1 January 2023.

Spinoza and Stevin Prizewinners

Prof. Corné Pieterse

Prof. Thea Hilhorst



Prof. Tanja van der Lippe

Prof. Corné Pieterse, Plant Breeding 1988, and **Prof. Thea Hilhorst,** Rural Sociology of the Non-Western Regions 1988, both received Spinoza prizes. **Prof. Tanja van der Lippe,** Domestic Sciences 1988, received the Stevin Prize. The prizes, worth 1.5 million euros per person, are the highest accolade in Dutch science.
Prof. Thea Hilhorst has also been appointed professor in the Faculty of Humanities at Leiden University.
October 2022.

Grants for talented female alumni

Adita de Haan-Fuentes Usquiano MSc, Food Technology 2012, and **Martyna Hogendorf MSc,** Nutrition and Health 2018, both received a Marina van Damme grant of 9000 euros for talented female alumni. Adita de Haan-Fuentes Usquiano, from Peru, works on the procurement of medical products such as diagnostic rapid tests and medical aids. Martyna Hogendorf works for the World Health Organization in low- and middle-income countries on non-communicable diseases such as diabetes and cancer. 10 February 2023.

Research Award

Balwina Koopal PhD, Molecular Life Sciences 2017, won the Research Award 2023 for her discovery of a new immune system in bacteria. The prize of 2500 euros from the University Fund Wageningen was handed over during the 105th Dies Natalis. 10 March 2023.

PHOTO GUY ACKERMANS

Best university lecturer in the Netherlands

Birgit Boogaard PhD, Animal Science 2003, has been proclaimed national Teacher of the Year. Boogaard is a researcher and lecturer in the WUR chair group Knowledge, Technology and Innovation. The election of the national Teacher of the Year is an initiative of the Dutch National Students' Association (ISO) and the Comenius network of university lecturers. In addition to the honorary title, the winner gets a sum of 25,000 euros to spend on teaching activities. 24 April 2023.

IN MEMORIAM

Alumni and current and former employees of Wageningen University & Research who have recently passed away.

Mr J.T.P.M. Bink MSc, Tropical Plant Breeding 1961. 27 January 2023.
Ms D.H. van Adrichem Boogaert MSc, Agricultural Plant Breeding 1963. 25 November 2022.
Ms C.E. van den Ban-Willinge Prins MSc, Tropical Domestic Science 1957. 8 April 2023.
Ms S. Beers MSc, Zootechnics 1989. 7 April 2023.
Mr W. van den Berg PhD, Agricultural Plant Breeding 1987. 12 February 2023.
Mr T.A. Bierman MSc, Forestry 1966. 19 December 2022.
Mr F. de Boer MSc, Zootechnics 1950. 25 November 2022.
Mr B.W.J. Boerboom PhD, Horticulture 1972. 4 January 2023.
Mr M.H. Bonestroo PhD, Food Technology 1988. 22 November 2022.
Mr A.M. van der Burgt MSc, Forestry 1966. 5 November 2022.
Mr P.J. Dieleman MSc, Dairy Production 1956. 15 January 2023.
Mr W.J. Droesen PhD, Land Development A 1987. 30 March 2023.
Mr P.C. Duives MSc, Environmental Protection (water purification) 1983. 15 September 2022.
Mr H. Goote MSc, Horticulture 1963. 4 December 2022.
Mr L.W.M. Hendrikx MSc, Rural Economics 1955. 2 April 2023.
Mr J.A.M.S. Halie de Hallois MSc, Food Technology 1979. 1 August 2022.
Mr T. Hijwegen MSc, Horticulture 1959. 20 February 2023.
Mr Y. van der Honing PhD, Zootechnics 1966. 25 January 2023.
Ms M. van der Horst MSc, Communication Science 2017. 25 March 2023.
Prof. A. van Kammen, emeritus professor of Molecular Biology. 1 March 2023.
Ms M.W. Kanning MSc, Food Technology 1994. 5 December 2022.
Mr M.C. Klaij PhD, Farming Technology 1976. 11 November 2022.
Mr D.W. Krijgsman MSc, Soil and Fertilization Science 1970. 23 March 2023.
Mr T. Limonard PhD, Phytopathology 1964. 18 April 2023.
Ms M.A. van Ommering MSc, Human Nutrition 1989. 18 March 2023.
Mr M. Schuiling MSc, Phytopathology 1968. 16 December 2022.
Mr A.J.M. de Schutter MSc, Land Development A 1978. 15 January 2023.
Mr J. Teeselink MSc, Rural Economics 1973. 20 December 2022.
Mr J.A.J. Veenenbos MSc, Agricultural Plant Breeding 1950. 14 October 2022.
Mr P.K. ter Veer MSc, Zootechnics 1969. 11 December 2022.
Mr A.D. Verhoeff MSc, Tropical Animal Husbandry 1965. 25 November 2022.
Mr J.A. Vermaat MSc, Tropical Animal Husbandry 1956. 27 October 2022.
Mr F.E. Vreden MSc, Forestry 1970. 4 December 2022.
Ms D.A. de Vries, Domestic Science 1959. 12 November 2022.
Mr K.H.L. Westerling MSc, Landscape Architecture 1962. 20 January 2023.
Mr S.E. van Wieren PhD, PhD 1996. 21 December 2022.
Ms L.J. Wilms-Davids MSc, Horticulture 1958. 15 April 2023.
Mr T.T. Wind MSc, Rural Economics 1957. 7 September 2022.
Mr W.H.I. Zwart MSc, Forestry 1958. 7 February 2023.

If you would like to inform us of the death of a fellow former student or relative, you can email alumni@wur.nl or send a death announcement to the Alumni Department, Wageningen University & Research, Droevendaalsesteeg 4, 6708 PB Wageningen,The Netherlands

BOOKS BY ALUMNI

Dutch landscape plan

Henk van Blerck, Landscape Architecture 1985, turned his PhD thesis into a book. In it, he describes the planting patterns that were designed and introduced in the Dutch landscape between 1946 and 1976 and now determine what the cultivated land looks like. *Schokland & Water, 65 euros*

Farmers and the city

In his book, **Berend Wierenga**, Rural Economics 1968, discusses how the city of Groningen developed the Nieuwe Ruigezandster Polder in 1877 and relations between the residents and the city. *Profiel, 27 euros*

How persistent, that tropical blue sky

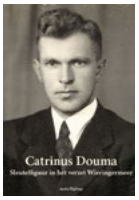
Carin Vijfhuizen, Rural Sociology 1989, turned her thesis into poetic verse about her daily life in an African village in Zimbabwe. Available in Dutch and English. *Elikser 20.90 euros*

A rare breed of pig

Martin Woestenburg, Rural Sociology 1990, has written a lively portrait of an idiosyncratic breed of pigs with black patches kept by idiosyncratic people. They use traditional forms of pig farming to develop and maintain traditional pig genes. *Noordboek, 17.90 euros*

Beyond time and chance

To what extent can we fully grasp the universe and nature through creation and evolution? And how logical is creation or evolution without a Creator? These are the questions addressed by **Arie Sonneveld,** Molecular Sciences 1976, in his book. *Buijten & Schipperheijn Motief, 25 euros*



Catrinus Douma

Anita Blijdorp, Rural Sociology of the Non-Western Regions 1988, wrote a book about the forgotten resistance figure Catrinus Douma (1917-1945), a dealer in seed in Wieringermeer. For two years, he arranged places for people to hide, false identity papers and food.
Anita Blijdorp, 10 euros

Lifelong activist

After 60 years of activism, **Hans Beerends** reflects with the authors Ellen Mangnus, Development Economics 2007, and Marc Broere on the fight for a fairer world. What has been achieved? How can you stay optimistic when you see what is in the papers? How can you mobilize people? *Lemniscaat, 19.99 euros*

The hidden relay race

Reproductive genetics links successive generations, with fertility playing an important role. The cell line responsible for this is the germline. **Peter de Boer,** Zootechnics 1971, wrote a book on the topic. Marc Maas, Biology 2000, created the illustrations. *Radboud University Press, free online , paperback 20 euros*

Our food, a lifelong story

Louise Fresco, Rural Sociology of the Non-Western Regions 1976, former president of the WUR Executive Board, explains how her thinking about food has changed. Travels, dishes, the latest scientific insights and art spark off associations and questions. An optimistic book about the stories behind every meal. *Prometheus, 23.99 euros*

The never-ending life of travel stories

One holiday is barely over and we are already planning the next. Why do we do that? Travel stories are a good source for answers to that question. This book by **Jaap Lengkeek,** WUR PhD 1994, tells the history of travel stories from the oldest ones to today's tales. *Walburgpers, 29.99 euros*

Understanding the landscape

In this book, **Wim de Haas,** Landscape Planning 1981, uses Zen and the Art of Motorcycle Maintenance by Robert M. Pirsig as an aid to explore the significance of the landscape today and how society should deal with the landscape.
De Graaff, 25.50 euros

Ellen van Velthoven, voice coach

Nutrition and Communication, 1995

'When I started at university, I joined the student society SSR. One evening, someone was playing the piano in the basement there and it really moved me. I remembered that I had always been interested in music at primary school, but had gradually lost interest. I realized that my passion lies in music and psychology. After graduating, I trained as a singer at the conservatoire and did several courses in psychology.

'In 2007, I started my own voice practice, The SongWorks, in which I work as a voice coach, trainer and teacher. I also perform regularly as a singer. What I love about my work is that you can help people progress in with their personal development, using their voice. A lot of people find it hard to express themselves freely. You might hold back, be afraid to take up space or suffer from performance anxiety.

'Whether you're speaking or singing, your voice comes out of your body and if there is a lot of tension there, you can hear it. If you sound good, you feel relaxed. For example, in my practice I see people who don't make themselves heard because their voice is soft, or who get a sore throat from speaking tensely. The sound of your voice is also a way of getting in touch with your body. Your voice resonates in your body and that has a relaxing effect. The nicest part of it for me is seeing people leave again feeling relaxed.'

'A lot of people find it hard to express themselves freely'

PHOTO HARMEN DE JONG

PHOTO EWOUT KNOESTER

Newly constructed coral reef in Kenya flourishes

Researchers have constructed a new coral reef off the coast of south-eastern Kenya. Two years after it was established, the biodiversity of fish and other wildlife around the coral is comparable to that on natural reefs in the area, shows a Wageningen study published in the scientific journal *Frontiers in Marine Science*.

First, small pieces of coral were suspended in special nursery structures where they could grow into adult colonies. Then divers attached these cultivated corals to structures placed on the seabed. The cultivated corals were found to develop best on metal cages, whereas young natural corals could establish themselves better on concrete structures. 'And sometimes you run into something unexpected,' says Ewout Knoester, a researcher in Kenya. 'Sea turtles turn out to like lying on the concrete structures and rubbing their shells against them. That's not very good for the corals on these structures. We are now considering adding special resting places for turtles at these locations.'

The project is being implemented by WUR, REEFolution Foundation and local organizations. Fishers from nearby villages were trained in diving, building coral reefs and managing fish stocks. They hope the establishment of the new reefs will make for a more ecologically stable coastal area and boost the local economy.

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